(RESEARCH ARTICLE)

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Socio- economic status and household practices influence on undernutrition among children under five years in the Effutu municipality

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Abstract

Introduction: Malnutrition is an underlying factor in many diseases for both children and adults and is particularly prevalent in developing countries. Malnutrition has been a worldwide problem which is being tackled in various ways and is usually prevalent among children in developing economies. The purpose of the study was to examine the Socio-economic status and household practices influence on undernutrition among children under five years in the Effutu Municipality.

Methodology: A community-based research was conducted to assess the nutritional status of children under five years in Effutu municipality for a total of 350 children. A simple random sampling was used to select the communities for the study. Modified random walk was use to select the households from housing units. With the use of a pre-tested and structured questionnaire, data on children and care givers was collected. WHO Anthro software version 3.2.1 was used in determining the z-scores and SPSS software version 20 was used to perform univariate, and bivariate logistic regression analysis. A $p<0.05$ was deemed statistically significant.

Results: Out of the 350 children under five, the most prevalent undernutrition case was stunting (59%). Stunting was most prevalent among children in the age group of 12-23 months (35.5%). Number of times child feeds daily is the only house hold practice that is associated with stunting at 95% significant level. Children whose parents were unemployed were almost twice likely to be stunted than those who were self-employed (OR=1.902 95% CI, 114 - 3.246). Children with parents who earn less than Ghc100 were about 10 times more likely to be stunted than those who earn more than Ghc1000 (OR=10.179; 95% CI, 2.198 - 47.145).

Conclusion: The study showed that of the economic factors, mother's occupation and household income was significantly associated with their child being stunted. The number of times a child feeds in a day was significantly associated with their child being stunted.

Keywords: Household practices; Malnutrition; Overnutrition; Socio- economic; Stunting; Wasting

1 Introduction

Globally, undernutrition in children is highly prevalent and remains a big challenge. In 2018, wasting continued to threaten the lives of an estimated 7.3 per cent or 49 million children under 5 globally (1). In 2018, more than half (55%) of all stunted children, more than two thirds (68%) of all wasted children, and almost half (47%) of all overweight children under 5 lived in Asia and more than one third lived in Africa [1]. According to estimates by the United Nations

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Food and Agriculture Organization (FAO), 11.11% of world populations were suffering from chronic undernourishment in 2012-2014 [2]. Children are the most visible victims of undernutrition. United Nations Children's Fund (UNICEF), World health organization and the World bank reports that in 2020, globally, 149.2 million children under the age of 5 years of age were stunted, 45.4 million wasted, and 38.9 million overweight. The number of children with stunting is declining in all regions except Africa. [3]. This shows that almost half of all deaths in children under 5 can be attributable to under nutrition. This high prevalence of under-nutrition of children exerts impacts economically and socially on the country. Economic growth and human development requires a well- nourished populations who can learn new skills, think critically, and contribute to their communities. Child malnutrition impacts cognitive function and contributes to poverty through impeding individuals' ability to lead productive lives [4]. Malnutrition prevents children from reaching their full physical and mental potential; prolonged malnourishment in children has been known to result in: delay in their physical growth and motor development; lower intellectual quotient (IQ), greater behavioural problems and deficient social skills [3; 5]. Children less than five years worldwide are known to be vulnerable and susceptible in many respects, especially on matters on health [3]. Nutritional deficiencies and malnutrition generally affect children more than any other group [3]. This tread is not unique to any particular nation; poor nutrition occurs in developing and developed nations, however, it is prevalent in some nations than others. According to WHO's report, in 2018, more than two thirds of all wasted children under 5 lived in Asia and more than one quarter lived in Africa [1; 6]. Child malnutrition accounts to about 60 percent of mortality of children under-five in Sub-Saharan Africa (SSA) countries [7]. The highest numbers of malnutrition occur in unstable countries which suffer from different kinds of conflicts, countries that are vulnerable and fragile [7]. Such countries need more support and actions to reduce the malnutrition. continuous malnutrition is very destructive to a child causing stunting and has an effect on the family to a large extent, since severe malnutrition children can have impaired learning and psychological problems, which to a large extent can be a source of worry to their parents [4;7]. Malnutrition also weakens child's health, immunity level, learning ability, and later on livelihood and capability to have healthy children on his/her own [8; 9]. The Sustainable Development Goal 1: end poverty in all its forms everywhere; Goal: end hunger, achieve food security and improved nutrition and promote sustainable agriculture and Goal 3: Ensure healthy lives and promote well-being for all at all ages [10].The burden of under-nutrition among under-five children has not changed much even though various intervention programs are in operation in the world [11]. Malnutrition has been a worldwide problem which has been tackled in various ways but the problem still lives with us. It continues to kill millions of children daily [3]. Worldwide, approximately 149.2 million children under the age of 5 years of age were stunted, 45.4 million wasted, and 38.9 million overweight. [3; 12]. Malnutrition is an underlying factor in many diseases for both children and adults such as diabetes and hypertension [13] and is particularly prevalent in developing countries, where it affects one out of every 3 preschool-age children. [14]. In Ghana, malnutrition still remains a challenge among children under five. Ghana Statistical Service (GSS) report indicates that 19% of children under five are stunted, 5% severely stunted, 11% underweight, indicating chronic malnutrition [15]. The Central Region where Winneba is located has 34% of children under five stunted [15]. Report available at the Winneba Municipal Health Directorate (WMHD) indicates that the municipality recorded 6000 cases of malnutrition in children under five between 2010 and 2015 [16]. This is relatively high for a fishing community as literature from other places reveals that nutrition is relatively low in fishing communities where there is the abundance of protein [2]. This is a phenomenon that is very important, and tackling its prevalence is also important to reduce the effect of malnutrition. One major way to do this is by determining the determinants of malnutrition, which will help in better understanding of phenomena, and tackling it. The study therefore sought to investigate the influence of socio-economic status and household practices on undernutrition among children under five years in the Effutu Municipality.

Objectives of the study

- To determine the association between socio- economic status and the most prevalent form of undernutrition in children under five years in the municipality.
- To determine the levels of malnutrition among the children under five years in the municipality.
- To determine how household practices influence the most prevalent form of undernutrition in children less than five years in the municipality.

2 Methods

2.1 Study Design

The study was a descriptive cross-sectional study to assess the socio- economic status and household practices influence on undernutrition among children under five years in the Effutu Municipality.

2.2   Study Area

The study was conducted in the Effutu Municipality in the Central Region of Ghana. The Effutu Municipal Assembly is one of the 216 Administrative Districts in Ghana and one of the 20 districts in the Central Region. Currently, the Municipality has been divided into four sub-areas called sub-Municipalities with 17 Electoral areas. The land area of the Municipality is 64 square kilometers. It is bounded on the North by Gomoa East, on the South by the Gulf of Guinea, on the East by Gomoa East and on the West by Gomoa West. Winneba with a population of 40,017 is the only urban settlement. Other big settlements in the Municipality are Sankor, Gyangyenadze, Nsuekyir, Ateitu, Osubonpanyin and Woarabeba. All the Sub- districts were used for the study. The Municipality has a total population of 82,470 for the year 2016. The Municipality has 12 Health institutions.

2.3   Study Population

The population for the study were children between the ages of 6-59 months and their caregivers in Effutu Municipality who agreed to participate in the study were included. Children whose parents did not reside in the Effutu Municipality, and caregivers with children with ages below 6 months and above 59 months were excluded.

2.4   Sampling

2.4.1   Sample Size

The formula for estimating the sample size from the target population was $n = Z^2 pq/d^2$

n = Sample size $N = z$
Z = 1.96, that is the value of Z corresponding to the 95% confidence level
p = 0.35 (35%) malnutrition prevalence rate of children under 5 years of 35%
q = 1-p (1-0.35=0.65)
d = 0.05 (5% error margin)

Ghana Statistical Service (GSS) report indicated that 19% of children under five in Ghana were stunted, 5% severely stunted, 11% underweight (15). The p, is the estimate of malnutrition among the target population according to GSS was 19% stunted, 5% severely stunted, and 11% underweight = 35%

$$n = 1.96^{2 \times} 0.35 (0.65)/0.05^2$$

$$n = 3.8416 \times 0.2275 = 0.873964/0.0025$$

$$n = 349.5856$$

$$n = 350$$

The sample size for the study was 350.

2.4.2   Sampling Method

Simple Random Sampling

The community was divided into four sub-districts namely Essuekyir - Gyahadze, Kojo-Beedu north-Low Cost, South East Winneba and south west Winneba respectively. A simple random sampling was used to select two communities from each sub-district. The data was collected from all the four sub-districts. Choosing the households was done by modified random walk. Respondents were chosen based on the population of the chosen communities. The communities do not have a proper housing list therefore, the modified random walk was use to select the households from housing units [17]. In doing the modified random walk, key land marks in the community such as churches, private and public schools, the mosque, the Community-based Health Planning and Services (CHPS) compound, the information centre and the community taxi rank were listed. One of the landmarks was randomly selected and the first house closest to the landmark was chosen as the first house from which subjects were selected. Dwelling place units were used for identification of households. Dwelling place refer to a specific area occupied by a particular household and therefore need not necessarily be the same as a house [18]. Children under-five years were identified by asking the residents of the chosen communities. All children aged 6-59 months from the different households who were eligible to be part of

the study in a house with several dwelling units were used. If in a household, where mothers have more than one child less than five years; one of the children was randomly selected to be part of the study.

2.5 Data Collection Technique/Method and Tools

2.5.1 Anthropometric Technique

Anthropometric measures (weight and height) were all taken and recorded on the questionnaires. All children were in only underwear or light clothing during measurements. The measurements were taken using WHO standard procedure. Each measurement was taken by a field skilled worker. The scales were checked for accuracy by before taken to the field.

Length measurement

Recumbent length was taken for children below 24 months. It was measured with the infantometer. The child was placed on the infantometer gently with his/her head against the head board. The child's head was positioned firmly in place by cupping the ears. It was ensured that the vertical line formed from the ear canal to the lower border of the eye socket the child was at right angle to the horizontal board. This is referred to as the Frankfort vertical plane. While another fieldworker ensured that the child's trunk was straight and flat on the board. The foot board was pushed gradually to the feet of the child with the left hand whiles the right was used to hold the legs together in place. The length was recorded on the questionnaire. Height was taken for children the rest of the children (above 24 months) with a stadiometer. The child was asked to stand on the footboard with the back of the head against the back board. This was to ensure that the back of their head, shoulder blade, back, buttocks calf and their heel touched the back board of the stadiometer. The head was positioned such that the horizontal line connecting the upper ear opening and lower edge socket of the eye ball run parallel to the base board. This is the formation of the Frankfort horizontal plane. The child's tummy was pushed in gently to help the child to stand straight and the head board pressed firmly on the top of the head. The reading was then taken and recorded on the questionnaire. Standing height and length were recorded to the nearest 0.1cm. Weight measurement: For children below 24 months, their mothers were made to stand on the scale without footwear and all heavy objects she was holding or adorned with had been collected. The scale was then tarred and the child handed to the mother on the scale for the weight of the child to be taken. For children above 24 months, they stood by themselves on the scale and their feet positioned slightly apart. They were instructed to stand still and the reading taken and recorded on the questionnaire. Weight measurements were taken to the nearest 0.1kg

2.5.2 Questionnaire

A questionnaire constructed by the researcher was used to collect the data from the respondents. The questionnaire consisted of a list of items related to the topic, research questions and the objectives of the study.

2.6 Data management and analysis

Of all 350 sampled people, 350 was obtained. Data was analysed with Statistical Package for Social Sciences (SPSS) version 20 and WHO Anthro Software version 3.2.1. Data collected on demographic characteristics were presented in tables as frequencies and percentages. For the anthropometric data obtained, the Height-for-age, (H/A), Weight-for-age (W/A) and Weight-for-Height (W/H) of the subjects was compared to the WHO child growth standards [6]. The general prevalence of malnutrition was assessed by the Z score so that those who fall below -2 Z score for height of age, weight of height and weight of age were classified as stunted, wasted and underweight. Those who fall above +2 Z-scores for weight of age were classified as overweight. The results for the prevalence of malnutrition was presented in pie and bar charts. Association between undernutrition and selected characteristics was limited to the most prevalent undernutrition, specifically stunting using chi –square test at 95% significant level. The study employed logistic regression to assess the statistical association between stunting of children under five years and those variables that were significant in the bivariate analysis at 95% significant levels. Crude and adjusted odds ratios, and p-values were obtained and statistical significance determined at 95% confidence intervals (CI).

2.7 Ethical Consideration/ Issues

Approval was sought from Ghana Health Service (GHS) Ethical Review Committee. Initial consultations was done with the Municipal Director of Health Services, Municipal Chief Executive, community leaders and assembly men of the selected suburbs, and management at the hospital and letter followed up to confirm the study. Written informed consent was obtained from mothers or guardians of the children, and consent was sort from the mothers or guardians before the children were used for the study. Explanation of the study to the participants was done in a language they understand to gain their maximum cooperation. Purpose and objective of the study was explained to the participants.

They were also informed that there will be no financial or material reward for participating, except that their participation will generate knowledge for taking measures to prevent undernutrition in the municipality and the country at large. Again they were told that their participation is voluntary and they can withdraw at any time if they feel like and without any consequences to them. Anonymity was also ensured by given a code number to each participant instead of their names. During data collection, all materials related to the study was stored in locked cabinet in the researcher's office.

3 Results

3.1 Characteristics and socio-demographic information of Children under five years

All the 350 respondents responded to the questionnaire. The results presented in Table 1 shows that majority of the children were within the ages of 12 to23 (33%) and males (50.9%), and majority of the mothers were within the age range of 20 to 34 (58%), Christians (68%), singles (35.4%) and have one child (33.2%). The results also showed that most (67.7%) of the parents of the children examined lived in rural areas.

Table 1 Characteristics and socio-demographic information of Children under five years

Variables	Frequency(N=350)	Percent
Age of Child (Months)		
6-11	88	25.1
12-23	114	32.6
24-35	60	17.1
35-47	50	14.3
48-59	38	10.9
Sex of Child		
Female	172	49.1
Male	178	50.9
Age of Mother		
less than 20 years	89	25.4
20-34	202	57.7
35-49Yrs	59	16.9
Religion of Mother		
Christian	237	67.7
Muslim	105	30
Traditionalist	8	2.3
Marital Status of Mother		
Single	124	35.4
Married	121	34.6
Separated	19	5.4
Divorced	2	0.6
Widowed	5	1.4
Cohabiting	79	22.6

|		
Number of Children by Mother		
1 Child	116	33.15
2 Children	87	24.9
3 Children	66	18.9
4 Children	69	19.7
More Than 4 Children	12	3.5
Type of Community		
Urban	110	31.4
Rural	240	76.7

3.2   General malnutrition levels of children under five years

The weight of age nutritional status had majority of the children used in the study being normal (64%), Figure 1
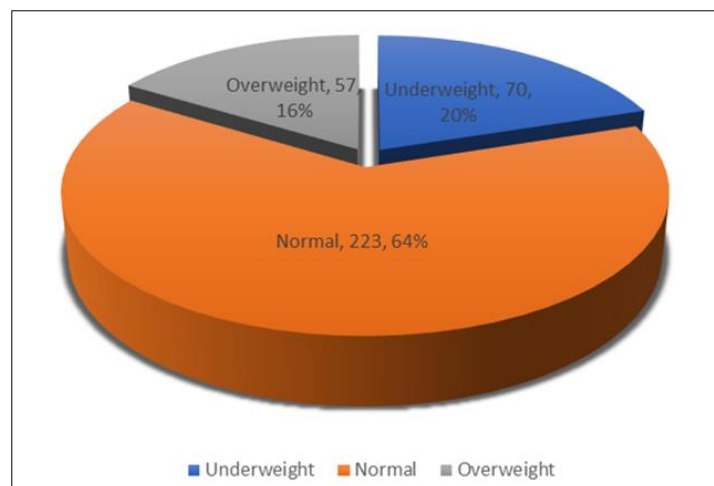
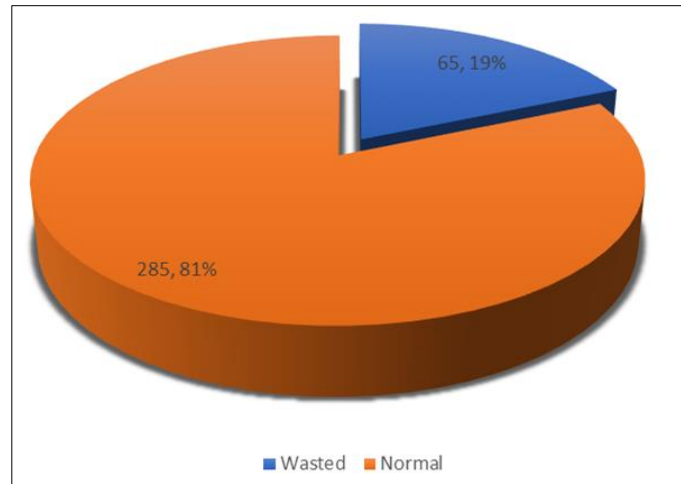**Figure 1** Nutritional status of under-five according to weight of age

The height of age nutritional status had majority of the children used in the study being stunted (59%), Figure 2.
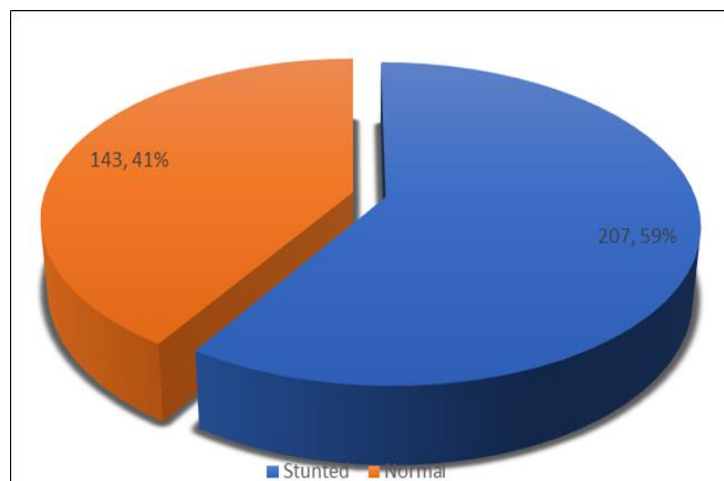
Figure 2 Nutritional status of under-five according to height of age (Stunting)

The weight of height nutritional status had majority of the children being wasted (59%), Figure 3.

Of all the undernutrion status, stunting was the most prevalent hence the study concentrated on stunting.

Figure 3 Nutritional status of under-five according to weight of height (Wasting)

Children who were between the age group of 12-23 months were most prevalent with stunting (35.5%). Followed by those who were within the ages of 6-11 months. The Least age group with stunting were those who were up to five months old.
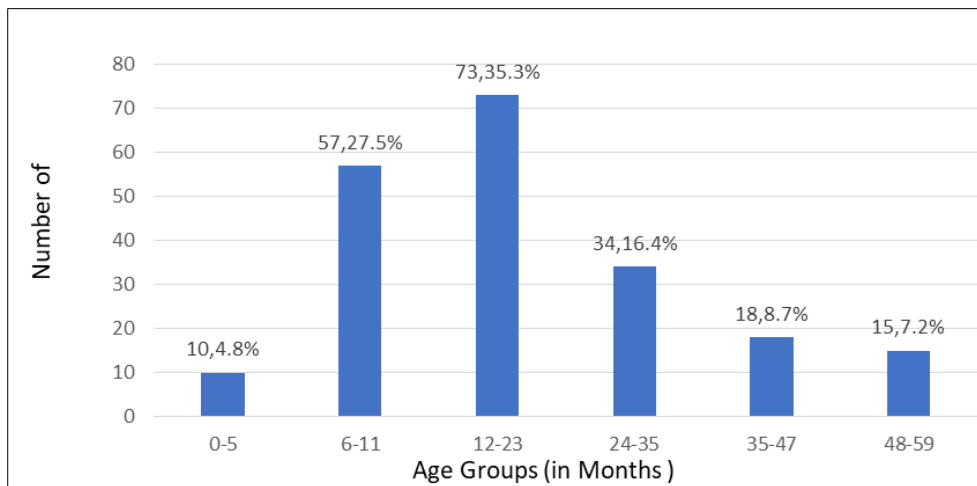
Figure 4 Stunting by age

3.3   Association of socio-economic factors with stunting

Unemployed mothers were found have more (68.5%) stunted children than normal. With regards to the occupation of the father, children of unemployed father were more (51.3%) stunted than normal. Children who lived in households that earn less than Gh100, were more stunted than normal with (62.1%). Children of mothers who had no formal education were more stunted than normal (62.2%).

Of all the socio-economic factors of undernutrition, occupation and education of the mother and household incomes was found to be significantly associated with a child's undernutrition status at $P<0.05$ and $P<0.01$ respectively.

Table 2 Cross tabulation using chi-square analysis of stunting status and children under- five in Effutu municipality: Socio-Economic factors

Characteristics	Outcome (n=350)			
	Stunted (%)	Normal (%)	Chi-Square	P-Value
Occupation of Mother				
Unemployed	61(68.5)	28(31.5)		
Self Employed	144(56.3)	112(43.8)	4.897	0.038*
Civil/Public Servant	2(40)	3(60)		
Occupation of Father				
Unemployed	20(51.3)	19(48.7)		
Self Employed	181(60.1)	120(39.9)	1.122	0.571
Civil/Public Servant	6(60)	4(40)		
Household Income per month				
Less than 100	95(62.1)	58(37.9)		
100 to 200	59(59.6)	40(40.4)		
201 to 500	34(63)	20(37)	12.619	0.013**
501 to 1000	17(56.7)	13(43.3)		
Above 1000	2(14.3)	12(85.7)		
Educational Levels				
Tertiary	8(40)	12(60)		
Secondary	30(53.6)	26(46.4)		
Junior High School	6(85.7)	1(14.3)	6.263	0.18
Primary	112(60.5)	73(39.5)		
No Formal Education	51(62.2)	31(37.8)		

*P-value significant at 0.05, **P-value significant at 0.01

3.4 Socio-Economic factors associated with stunting among children under five years

Table 3 Binary logistic analysis of selected exposure variables and Stunting: Socio-economic factors

Characteristics	P Value	Crude OR	95% CI	P value	adjusted OR	95% CI
Occupation of Mother						
Unemployed	0.531			0.451		
Self Employed	0.032	1.902	(1.114 - 3.246)	0.053	1.715	(0.967 - 3.041)
Civil/Public Servant	0.546	3.812	(0.599 - 24.258)	0.621	2.109	(0.225 - 19.81)
Household Income/Month						
Less than 100	0.064			0.385		
100 to 200	0.067	0.994	(0.581 - 1.701)	0.078	1.032	(0.581 - 1.832)
201 to 500	0.241	0.948	(0.494 - 1.818)	0.578	0.918	(0.456 - 1.85)
501 to 1000	0.146	1.297	(0.586 - 2.87)	0.932	0.691	(0.274 - 1.741)
Above 1000	0.004	10.179	(2.198 - 47.145)	0.0241	5.227	(1.03 - 26.533)

Outcomes from the simple logistic regression modelling are presented together with their unadjusted and adjusted measures of association. Children of parents who are self-employed were almost twice less likely to be stunted than those who are unemployed (OR=1.902, 95% CI, 114 - 3.246). Again those who earn more than Ghc1000 are about 10 times less likely to be stunted than those who earn less than Ghc100 (OR=10.179; 95% CI, 2.198 - 47.145).

3.5 Association of Household practices with stunting

Table 4 Bivariate analysis of stunting status and children under- five in Effutu municipality: household practices factors

characteristics	Outcome (n=350)			
	Stunted (%)	Normal (%)	Chi Square	P value
How long child was fed on breast milk only				
did not do exclusive breastfeeding	3(42.9)	4(57.1)		
3 Months	88(60.7)	57(39.3)		
6 Months	87(62.1)	53(37.9)	2.644	0.619
1 Year	5(45.5)	6(54.5)		
More Than a Year	24(54.5)	20(45.5)		
How many times child feeds in a day				
Once	3(75)	1(25)		
Twice	26(43.3)	34(56.7)		
Thrice	117(62.9)	69(37.1)	8.269	0.041*
As and when Necessary	61(62.9)	36(37.1)		
Main Source of Drinking Water				
Pipe Borne Water	148(61.4)	93(38.6)		
Dug Well	28(54.9)	23(45.1)		
Rain Water	1(100)	0(0)	3.603	0.462
Bottled Water	14(66.7)	7(33.3)		
Sachet Water	16(48.5)	17(51.5)		
How Household Prefer Food Served				
Hot	139(60.4)	91(39.6)		
Cold	55(60.4)	36(39.6)	1.088	0.580
warm	13(50)	13(50)		
How Refuse is Stored				
Sanitary Dustbins	108(59.7)	73(40.3)		
Receptacles	36(56.3)	28(43.8)		
Other Storages	1(33.3)	2(66.7)	1.535	0.674
Without Storage Facility	62(62.6)	37(37.4)		
Toilet facility Available				
Water Closet	22(56.4)	17(43.6)		
KVIP	90(56.3)	70(43.8)		
Pit Latrine	84(62.7)	50(37.3)	3.534	0.316
Indiscriminate Defecation	11(78.6)	3(21.4)		

P-value significant at 0.05, **P-value significant at 0.01

Considering how long children are exclusively fed on breast milk, there were more stunted children than normal children for those who did exclusive breast feeding for six months (62.1%). With regards to how many times a child feeds in a day, more stunted than normal cases were recorded for those who feed once a day (75%). With regards to the main source of drinking water for a household and their child being either stunted or normal, there were more stunted children than normal for those whose main source of drinking water rain water (100%). Majority of children were stunted than normal in households who preferred food served hot and cold (60.4%). The way refuse are stored in a household had majority of the children being stunted than normal for those without storage facilities (62.6%). There were more stunted than normal cases for children who lived in households that do indiscriminate defecation (78.6%). On the whole, only the number of times a child feeds in a day was significantly associated with stunting with *p-value* 0.041.

Household practices factors associated with stunting among children under five years:

Outcomes from the simple logistic regression modelling are presented together with their unadjusted and adjusted measures of association. Simple logistic regression was performed for all selected household practices factors that were significant at P<0.05. From the logistic regression model, the number of times a child feeds in a day is not a significant related to a child being stunted.

Table 5 Associations between selected exposure variables and Stunting: household practices

Characteristics	P value	Crude OR	95% CI	P Value	Adjusted OR	95% CI
How Many Times Child Feeds in a day						
Once	0.521			0.621		
Twice	0.231	2.615	(0.225 - 30.434)	0.312	3.211	(0.258 - 39.999)
Thrice	0.121	1.145	(0.102 - 12.869)	0.112	1.29	(0.104 - 15.98)
As and when Necessary	0.076	1.049	(0.092 - 12.017)	0.089	1.001	(0.08 - 12.545)

4 Discussion

In this study, the indicators used in the assessment of general malnutrition were stunting, underweight, overweight and wasting. A total of 350 children were assessed. The findings of the study show that the prevalence of stunting, underweight, wasting and overweight were 59%, 20%, 19% and 16 % respectively. In investigating the undernutrition status in children under five years, it was discovered that in the three major types of undernutrition, stunting was more prevalence. This finding is close in line with those carried out on under five -year old children and under two-year old children in Pakistan [19] and Golestan, Iran province [20] where it was discovered that the prevalence of were stunted 44.4% of under-five children, 29.4% were underweight and 10.7% were wasted and slight to acute underweight, slight to acute wasting and slight to acute stunting were 21.4%, 16.5%, and 31.4% respectively. Also this is in line with the findings a study conducted among pre-school children in a rural area of western Kenya, and discovered that the prevalence of stunting, underweight, and wasting were 30%, 20%, and 4%, respectively [21]. It is also in congruence with the study conducted at North Shewa Oromia with the aim of assessing the prevalence of undernutrition and associated factors among children aged 6-59 months at Hidabu Abote district [22]. The similarities of the findings with these studies is in line with the study design, and tools for the data collection. The study also adopted a community based cross sectional study by sampling 820 children aged 6-59 months at Hidabu Abote district. Anthropometric measurements and structured questionnaires were used. The result showed that, 47.6%, 30.9% and 16.7% of children were stunted, underweight and wasted, respectively. The finding is however against a study that was carried out among 25-36 months old children under the care of Kerman, Iran rural health houses [23]. It was concluded that the prevalence of underweight, wasting, and shortness was worked out 16.1%, 7.2%, and 15.6% respectively. The occupation of fathers however had no significant relationship with their children being stunted. However, evaluating the phenomenon further, those who had self-employed mothers and fathers, were more predominantly associated with stunting than normal. Those who had mothers to be civil/public servants were predominantly normal than stunted. The findings also indicated that the level of household income was significantly association with stunting. Further, those living in households that earn more than GhC1000 were more predominantly normal than those who lived in households that earned less than GHC 1000. This finding is not in line with studies conducted in Bam, Wardha and Saudi Arabia. The authors posited that higher income results in higher probability of accessing quality health care, education, and

nutritional facilities which leads to lower undernutrition [24; 25; 26]. Basically according to them, knowledge with enough income can improve the nutritional status of a family. Also the educational level of mother was found to have significant relationship with their children being stunted. This finding is in congruence with other studies where the authors posit that illiteracy and low education of parents have an influence on the undernutrition of children [24; 25]. It is also in line with a study where Mother's education the strongest factor associated with undernutrition among the children under 5 years of age [27]. Children with mother with low educational level were about three times more likely to be stunted [19]. It is also in line with a study done at rural community of Osun state, Nigeria which was focused specifically on the influence of socio-economic factors on nutritional status of children [28]. It was revealed that children of mothers who were not educated beyond secondary school level had one and a half to two times the prevalence rate of stunting, on the other hand, children of mothers with post-secondary education were more often affected by undernutrition than those with less educated mothers [28]. In investigating how household practices influence the undernutrition in children less than five years certain indicators were considered. The result showed that there is no significant relationship between main sources of drinking water and stunting. Whiles considering how Household Prefer Food Served, it was discovered that there was no significant relationship. However, majority of households preferred food served hot. The least prevalent of the stunted children where those who preferred to be served food warm. How household refuse are stored also showed no significant relationship. Also there was no significant relationship between toilet facility available and undernutrition. However, among those stunted, those who stay in households that use KVIP was most prevalent. Further, the result of the analysis in the study showed that there is no significant relationship between how long children were fed on breast milk. In general, the finding showed that, the number of times a child feeds in a day is not a significant predicator of a child being stunted. This findings are against a study that was conducted on the prevalence and determinants of undernutrition among Under-five Children of Farming Households in Kwara State, Nigeria [29]. The study showed that undernutrition was significant associated gender and age of child, education and body mass index of mother, calorie intake of the households, access to clean water and presence of toilet in the households [29]. Also, the findings are against a study in Beta-Israel and concluded that the main contributing factors for under-five undernutrition was sex of the child, child's age, diarrhoea episode, deprivation of colostrum, duration of breastfeeding, pre-lacteal feeds, type of food, age of introduction of complementary feeding and method of feeding [30].

List of abbreviations

- CI: Confidence interval
- GHS: Ghana health service
- GSS: Ghana statistical service
- OR: Odd ratio
- SDG: Sustainable development goal
- UN: United Nations
- UNICEF: United Nations International Children's Emergency Fund
- WHO: World health organization

5 Conclusion

The study showed for occupation of fathers there was no significant relationship with their children being stunted, however there was for mothers. For educational level of parents there was no significant relationship with their children being stunted. The number of times a child feeds in a day however had significant relationship with stunted. It is recommended that the adverse effect of stunting of children under 5 should be constantly communicated to the general public by the Ghana health service. It is also recommended that parents should be educated on how to prevent stunting by Ghana health service in conjunction with medical professionals and hospitals.

Compliance with ethical standards

Disclosure of conflict of interest

The author has no competing interests.

Statement of ethical approval

The study was approved by the University of Ghana Ethical Review Board, Ghana Health Service, Ethics Review Committee, Effutu municipal Health Directorate, District Health Director, and community leaders. Informed consent was sought from the study participants.

Availability of data and material

The datasets generated during and/or analysed during the current study are not publicly available due to ethical reasons but are available from the corresponding author on reasonable request.

Authors' contributions

VT was responsible for the conception, design, data collection, data analysis, interpretation, and write-up. All authors read the final manuscript.

CA was involved in the design, interpretation of the data, write-up and in the preparation of the draft manuscript. All authors read the final manuscript.

Statement of informed consent

Informed consent was sought from the study participants by giving them informed consent forms to fill. Participants who could not read and write were asked to thumb print as approval for informed consent after the purpose of the study has been explained. Confidentiality and anonymity were ensured. The names of respondents were not associated with responses provided. Participants were informed about their freedom to skip some of the questions and exit from the study.

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