

## Factors influencing malnutrition in under-five children in Yemoh Town community; Bo city, Southern Sierra Leone

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### Abstract

This study investigated the prevalence and risk factors of malnutrition among under five children in Yemoh Town Community, Bo City, Southern Sierra Leone. The study made use of the survey design. The population comprised all under-five children and their lactating mothers/ care givers, a sample of 100 under-five children and 100 lactating mothers selected from the Yemoh town community. Systematic random sampling technique was used to select the households in the Yemoh town community. Semi structured interview questionnaire was developed and administered to the sampled lactating mothers/care takers of the under-five children and the Middle Upper Arm Circumference (MUAC) and height of the under-five children measured. Also, child welfare clinic cards/under five clinic cards were used to determine the age of the children. The study revealed that 48 percent of the sampled under-five malnourished children and out of this percentage, 55 percent were females. The findings revealed that the demographic factor associated with under-five children in Yemoh town community in Bo city is age distribution of the mother at birth. The socio-economic factors are Level of education of parent, parent's knowledge of the causes and methods of prevention of malnutrition, number of meals taken by the child per 24 hours, breastfeeding practices, household's employment status, alcohol intake by respondent mother/ caregiver, and parent's marital status. Also, the health related factors are antenatal clinic consultation (ANC), immunization status, vitamin A supplementation, and institution where child was delivered. It is recommended that increasing household food security and reinforcing educational intervention could contribute to the reduction in the prevalence of malnutrition of under-five children in the communities.

**Keywords:** malnutrition, under-five children, exclusive breastfeeding, parent, guardian

### Introduction

#### Background to the Study

Globally, an estimated 165 million under-five children were stunted in 2011. High prevalence levels of stunting among under-five children in Africa (36% in 2011) and Asia (27% in 2011) remain a public health problem, one which often goes unrecognized<sup>1</sup>. More than 90 percent of the world's stunted children live in Africa and Asia<sup>[1]</sup>.

Malnutrition continues to be a major public health problem in developing countries. It is the most important risk factor for the burden of diseases<sup>[2]</sup>. It is still an important problem among children aged 6-59 months. Therefore, especial attention should be given on its intervention.

A study conducted on malnutrition among under-five children in Bangladesh revealed that household economic status, mother's education, father's education, mother's antenatal visit (s), mother's age at birth and mother's BMI are the most significant factors/determinants of child's malnutrition<sup>[3]</sup>.

The World Health Organization (WHO) recommends a number of infant and young child feeding practices during the first 1000 days of life. These include initiation of breastfeeding within 1 hour of birth, exclusive breastfeeding until 6 months of age, continued breastfeeding up to 2 years of age and beyond, timely introduction of complementary feeding at 6 months, and appropriate complementary feeding to children 6–23 months. The Ministry of Health and Sanitation has instituted an infant and young child feeding program to increase

awareness and improve caregivers' knowledge of proper feeding practices. The activities are conducted at both the facility and community levels, through mother support groups<sup>[4]</sup>.

Minimum dietary diversity represents the proportion of children 6–23 months of age who receive food from four or more food groups per day. Minimum meal frequency is the proportion of breastfed and non-breastfed children 6–23 months of age who receive solid, semisolid or soft foods the minimum recommended number of times per day or more.<sup>4</sup> Minimum acceptable diet represents the proportion of children aged 6–23 months who receive a minimum acceptable diet apart from breast milk<sup>[4]</sup>.

Malnutrition rates in Sierra Leone are among the highest in the world. Some 46 percent of child deaths in Sierra Leone are attributed to malnutrition, the leading cause of child mortality in the country, and 267 out of every 1,000 children die before their fifth birthday. Malnutrition will be the primary cause of an estimated 74,000 child deaths during the next five years. If current levels of iodine deficiency do not improve over the next five years, 252,000 children could be born with varying degrees of mental retardation<sup>5</sup>. A total of 49,740 children are benefiting from the supplementary feeding programme across the country. The programme is vital to reducing malnutrition, and enriched foods provide vulnerable children the nutrients they need to thrive<sup>[5]</sup>.

Currently, more than a third of children under five in Sierra Leone are chronically malnourished. Their immune systems are weak and the risk of premature death is high. With one in every four children dying before his or her fifth birthday, Sierra Leone has one of the highest child mortality rates in the world [6]. The causes of malnutrition are varied and have been linked to a lack of awareness in mothers about breastfeeding, a reluctance to seek health care and a lack of food diversification due to poverty [6]. In Sierra Leone, the rates of early and exclusive breastfeeding for infants aged up to six months are very low – around 8 per cent. Often, infants are fed non-breast milk substitutes, especially water [6]. This can prove harmful, because breastfeeding provides children with essential nutritional benefits that cannot be found in other sources.

### Statement of the Problem

Despite all efforts undertaken both nationally and internationally, poor nutritional status is still a fundamental cause of disease and shortened life-span. Most people are aware that many factors are either directly or indirectly responsible for under nutrition, including insecure food supply, lack of basic education, inadequate health services, deteriorated environment, low income, and inadequate empowerment. The factors contributing to malnutrition vary from community to community. Stunted, underweight, and wasted children have an increased risk of death from diarrhea, pneumonia, measles, and other infectious diseases. However, poverty is nearly always an underlying factor [7].

Malnutrition in Sierra Leone is an important contributor to child mortality and morbidity. While there has been some reduction in malnutrition rates since 2005, data collected on stunting using different types of national surveys between 2010 and 2013 indicated that about 300,000 or one third of all children under five years are stunted and may never achieve their full potential in life. The causes of malnutrition are complex; encompassing dietary quality, caring practices, hygiene and access to effective health care [8].

Many nutrition efforts in Sierra Leonean communities saw added strain from the Ebola outbreak and the current austerity measures that have hit the country. Despite these setbacks, Sierra Leone is working hard to increase the nutrition and health status of its population. Although the country is making progress, there is still work to be done to decrease malnutrition in the various communities in the country. Malnutrition cannot be minimized or eradicated in communities without an insight into the factors that are influencing it.

It is against this background of lack of adequate information on the nutritional status and factors that are influencing the nutritional status of the under-five children in the Yimoh town community that this study has been tailored to respond to the following research questions.

### Research Questions

1. What is the nutritional status of under-five children in Yemoh town section in Bo city?
2. Which socio-economic characteristics, demographic characteristics, and health-related conditions contribute to the occurrence of malnutrition in children under the age of 5 years in Yemoh town section in Bo city?

### Justification of the Study

This study will help the health systems to detect malnutrition

at an early stage so that appropriate measures could be taken to address the factors related to malnutrition and designing relevant and timely interventions with the view to reduce the incidence of malnutrition in under-five children at the community levels.

The result of the finding and determinations of the risk factors for the condition of malnutrition among under-five children in Yemoh town community, Bo city, Sierra Leone may help the decision makers to formulate appropriate policy and intervention guidelines aimed at combating these factors and improving the nutritional status of the under-five children in the Community.

Institutions need to have among their resource materials, such a useful research product, which could be used to upgrade their knowledge about the factors influencing malnutrition in under-five children and as a result create more room for further research.

### Methodology

#### Research Design

The research is a survey design.

#### Study Area

The study was conducted in the YEMOH TOWN community which is one of the sections in Bo city. It is a densely populated community with a population of about 18,089 inhabitants [9] (Census 2015). Yemoh Town is bounded by new Gerihun road in the West, Gbendeva street in the North, Sogbandi street in the East and Fatu Kaillie street in the South. From the Summary of survey data for 20 sections of Bo city, Yemoh town section covers an area of 0.40 km<sup>2</sup> of land [10].

The major streets are Koroma yemoh street, Ngovao street, Thomas street, Belmoh street, Lucy kailie street, Umu street, Manganga, Abu and Momodu street. This community host two primary schools, Arkodus Muslim Primary School and Bo District Education Committee Primary School (BDEC), and one secondary school, St. Paul Junior Secondary School. There are mosques and churches located in the community.

In terms of their social activities the Yemoh town youths embark on football Gala, sport activities and dancing etc. The economic activities of the people are vegetable gardening, small scale business and commercial motor bike (okada) riding.

#### Population and Sample

The population comprised all under-five children and lactating mothers/care takers of children less than five years in Yemoh town section of Bo city.

The sample comprised 200 respondents in all, out of which 100 were under-five children and their 100 lactating mothers/caregivers in Yemoh town community, Bo city.

#### Instrumentation

Semi structured interview questionnaire was developed and administered to the sampled lactating mothers/caregivers of the under-five children in Yemoh town community. Also, the Middle Upper Arm Circumference (MUAC) tape and height board were used to measure the circumference of the upper arm and the height of the under-five children respectively. The child welfare clinic cards/under five clinic cards were used to determine the age of the under-five children.

**Sampling Techniques**

Systematic random sampling was used to select the households with eligible lactating mothers/care givers of under-five children. The households were selected starting with the house of the female chief of the Yemoh town community. If the household did not have eligible child or parent/caregiver refused to be interviewed or had no caregiver available replacement sampling was done by continuing to the next household.

**Data collection Methods**

Three data collectors were recruited and trained for one day using general instructions and practical exercises on how to measure the Middle Upper Arm Circumference (MUAC) and height of the under-five children, and administer the interview questionnaire. Their recruitment was based on reading and writing skills, ability to communicate in both English and any other local languages, experience in community based surveys and mobilization, and availability during the study period.

The interview questionnaire was pre-tested to gauge its feasibility. Based on the results of the pre-test, the interview questionnaire was re-adjusted for final administration. The interview information of the study was collected over a period of 10 working days on all the sampled lactating mothers/caregivers of under-five children in Yemoh town community. Each questionnaire was administered for 10-15 minutes. One hundred lactating mothers/caregivers were interviewed in English and where necessary in their local languages in their respective households. The questions in the schedule were both closed and opened questions to enable probing by the interviewer on important information that could not be directly brought out by them.

**Method of data analysis**

The statistical package SPSS was used to analyse the data. Descriptive analysis (percentages) was carried out on the data that were collected. The results are presented using tables, pie charts and bar graphs.

**Results**

**Research Question 1: What is the nutritional status of under-five children in Yemoh town section in Bo city?**

Data presented in table 1 and figures 1 are used to answer research question 1.

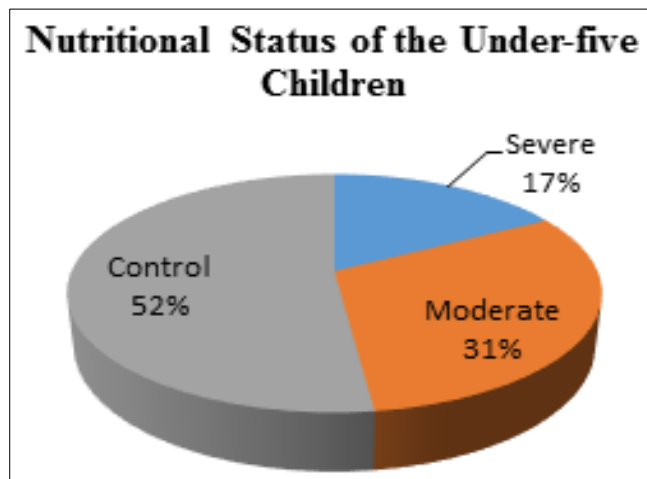
**Table 1:** Age and Sex Distribution of Sampled Under-five Children

Age Range of Under-five Children	Percentage of Children
Age (months):	
0-12	56
13-24	12
25-36	13
37-48	10
49-59	9
Sex:	
Male	45
Female	55
Total	100

Source: Field data collected

Table 1 shows that 56 percent of the under-five children sampled are aged 0-12 months, 12 percent are aged 13-24

months, 13 percent are aged 25-36 months, 10 percent are aged 37-48 months, and 9 are aged 49-59 months. Also, 55.0 percent were female under-five children while 45.0 percent were male under-five children.



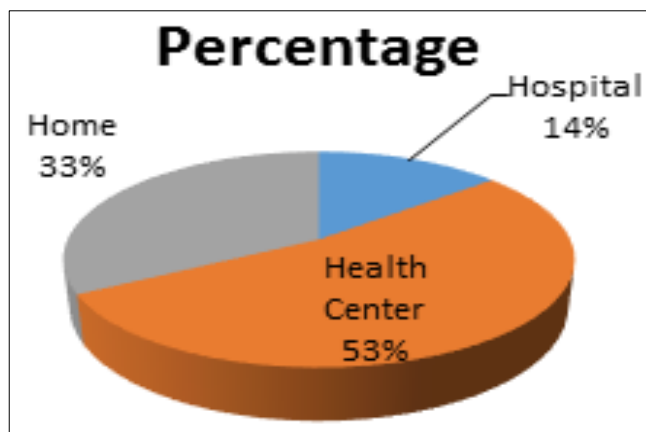
Source: Field data collected

**Fig 1:** Nutritional Status of the Under-five Children

Figure 3 shows that 52.0 percent of the participant children were well nourished and 31.0 percent were moderately malnourished while 17.0 percent were severely malnourished. The figure shows that 48 percent of the under-five children sampled were malnourished.

**Research Question 2: Which socio-economic characteristics, demographic characteristics, and health-related conditions contribute to the occurrence of malnutrition in under-five children in Yemoh town community in Bo city?**

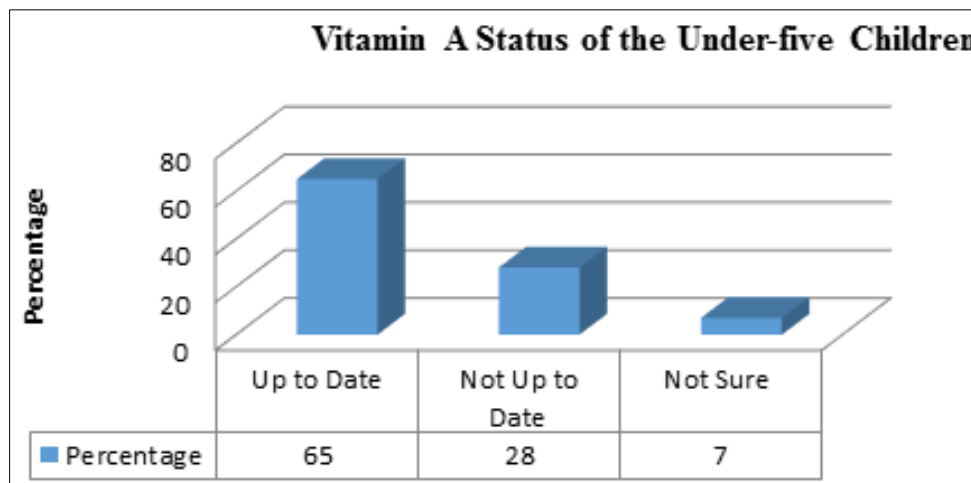
Data presented in figures 2 to 14, are used to answer research question 2.



Source: Field data collected

**Fig 2:** Institution where child was delivered

According to figure 2, 53 percent of the respondents said that they were delivered in the clinic, and 33 percent said they were delivered in home while 14 percent said they delivered in private hospital. About one third of the under-five children were not delivered in health care institutions.



Source: Field data collected

Fig 3: Vitamin A Status of the Under-five Children

According to figure 3, 65 percent of the Vitamin A supplementation was up to date for the age and 28 percent were not up to date for age while 7 percent were not sure of taking the vitamin for their age. The dates were collected from the

children’s under five cards that were presented by the respondents. In summary, 35 percent of the under-five children were not up to date for the supplementation.

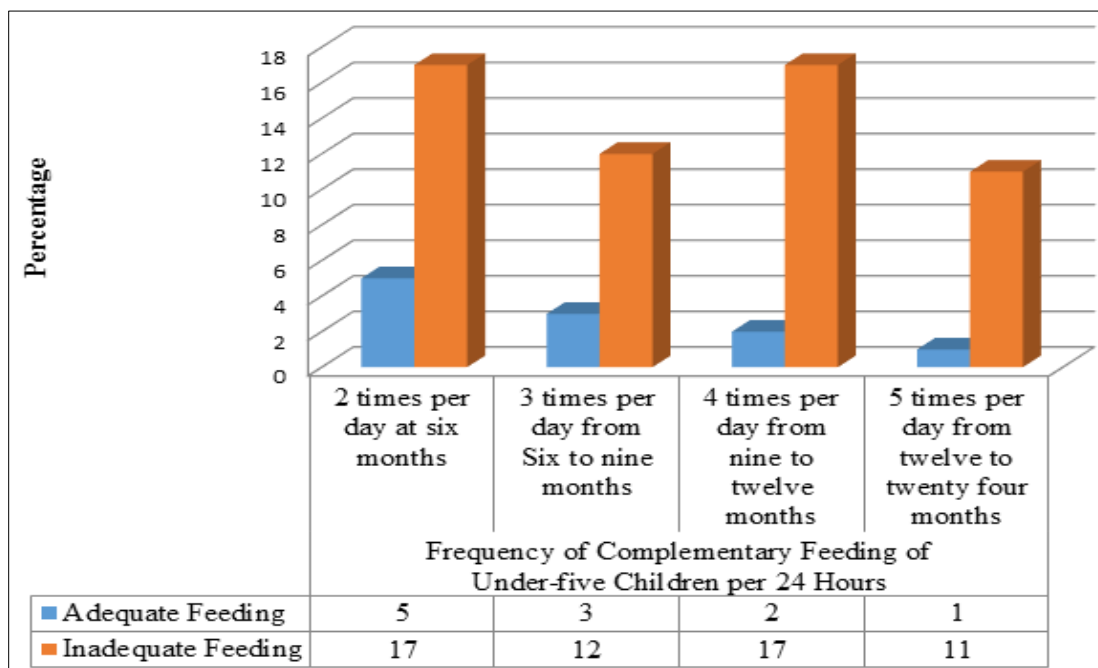
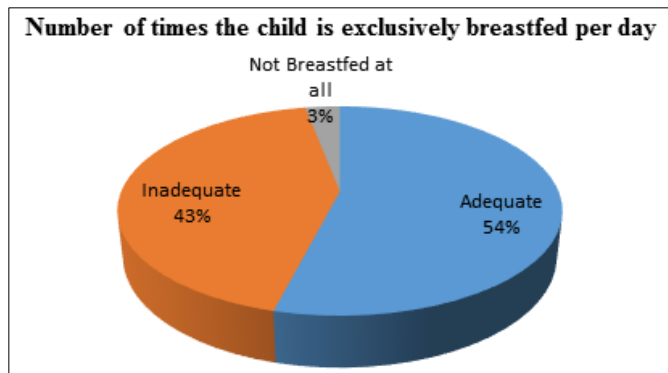


Fig 4: Frequency of Complementary Feeding of Under-five Children per 24 Hours

Figure 4 shows that 11 under-five children sampled had adequate age appropriate feeding per day (i.e. 2 times at 6 months, 3 times from six to up to nine months, 4 times from

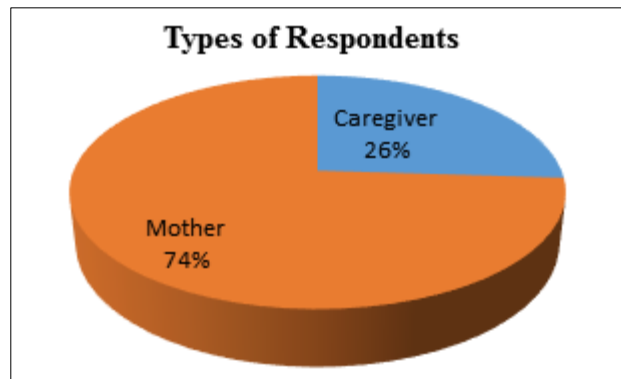
nine to twelve months, and 5 times from twelve to twenty four months), while 57 had inadequate age appropriate feeding per day.



Source: Field data collected

Fig 5: Number of Times the Child is Exclusively Breastfed per Day

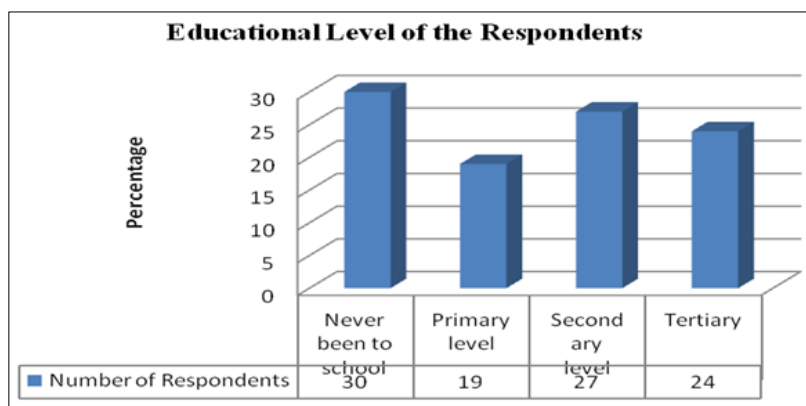
From figure 5, 54 percent of the respondent said they gave adequate breast milk 6-8 times per 24 hours to their child after delivery and 43 percent said the only gave breast milk to their child 3-5 times per 24 hours while 3 percent did not breastfeed at all during lactation.



Source: Field data collected

Fig 6: The Types of Respondents

According to figure 6, 74.0 percent of respondents were the biological mothers of the participant children of the sampled size of the study while 26.0 percent were caregivers of children.

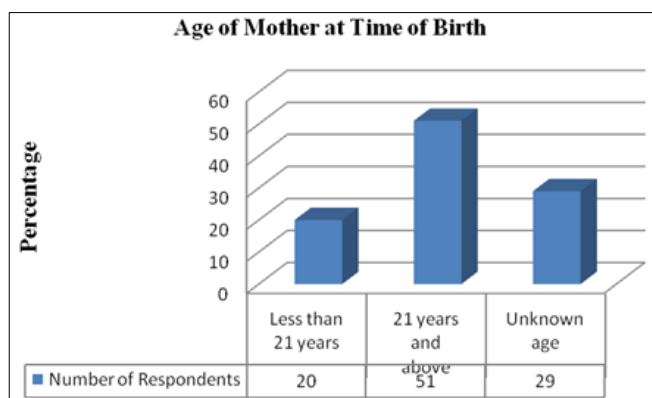


Source: Field data collected

Fig 7: Educational Level of Mothers of Under-five Children

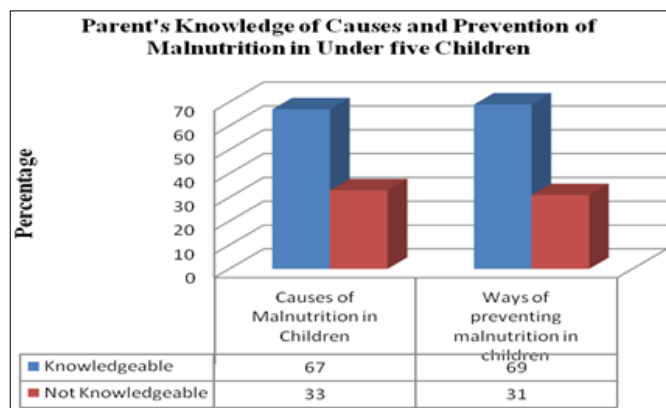
According to figure 7, 30 percent of the respondents said they have never been to school 19 percent attained primary school level and 27 percent attained secondary school level while 24 percent attained tertiary education. From the figure the illiteracy level is higher, which may lead to high prevalence of malnutrition in the sampled community.

Figure 8 shows that 20 percent of the respondents were less than 21years at the time of birth of the participant child, 51 percent of these respondents were above 21years of age at the time of birth of the participant child while 29 percent were unable to show their age



Source: Field data collected

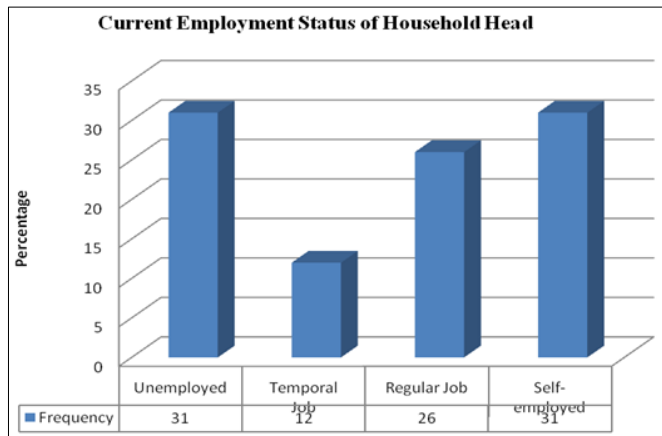
Fig 8: Age Distribution of Mother at Time of Birth



Source: Field data collected

Fig 9: Parent's Knowledge of Causes and Prevention of Malnutrition in Under-five Children

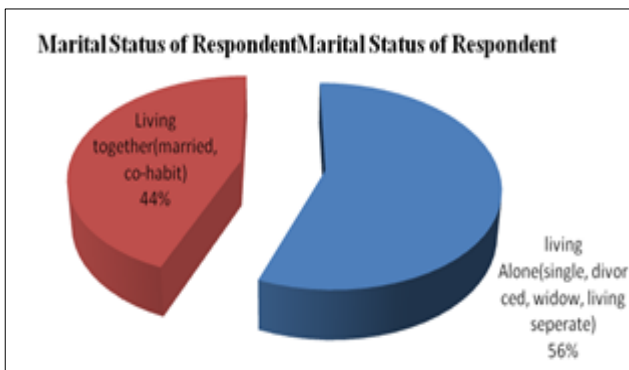
Figure 9, shows a multiple bar of the respondent knowledge about the causes and prevention of Malnutrition in under-five children of the sampled size. The figure shows that 67 percent were knowledgeable about the causes of malnutrition by giving at least one cause and 69 percent were knowledgeable about the prevention of malnutrition in under-five children of the sampled size. However, 33 percent were not knowledgeable of the causes as they failed to give at least one cause and 31 percent not knowledgeable of ways of preventing malnutrition in their under five children.



Source: Field data collected

Fig 10: Current Employment Status of Household Head

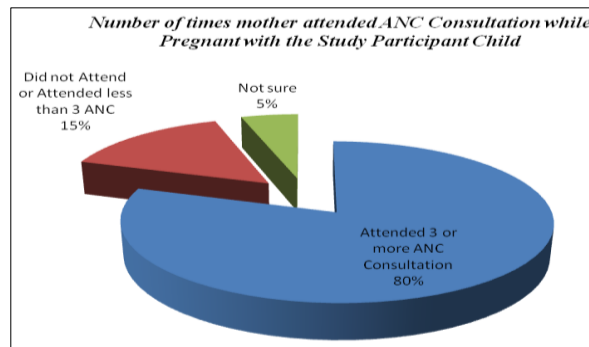
Figure 10 shows that 31 percent of the respondent’s household heads were unemployed, 12 percent were having a temporal job and 26 percent were having a regular employment while 31 percent were self-employed. In summary, slightly above two fifth of the household heads were unemployed.



Source: Field data collected

Fig 11: Marital Status of the Respondent

According to figure 11, 44 percent of respondents said that they are living together with their husbands or co-habiting, while 56 percent of the respondents were living alone meaning they are either single, divorced, widowed, or living separate. Slightly above half of the respondents reported living alone.



Source: Field data collected

Fig 12: Number of times mother attended Antenatal Clinic (ANC) consultation while Pregnant with the study Participant Child

According to figure 12, 80 percent of the respondents said they attended ANC consultation 3 or more times while pregnant with the study participant, 15 percent attended less than three ANC consultations while pregnant 5 percent of the study respondents were not sure of their attendance to ANC consultation. One fifth of the respondents did not or are not sure to have attended ANC meeting less than 3 times.

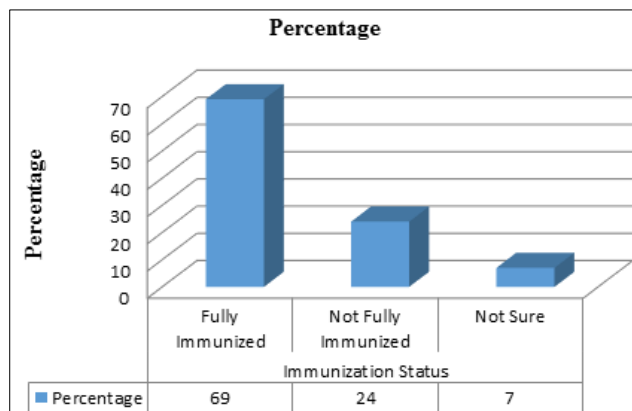
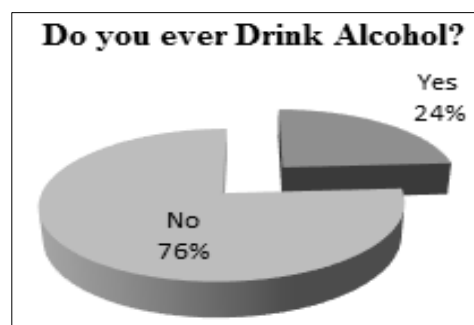


Fig 13: Immunization Status of Under-five Children

Figure 13 shows that 69 percent of sampled under-five children were fully immunized 24 percent not fully immunized, while 7 percent were not sure whether their children had been immunized.

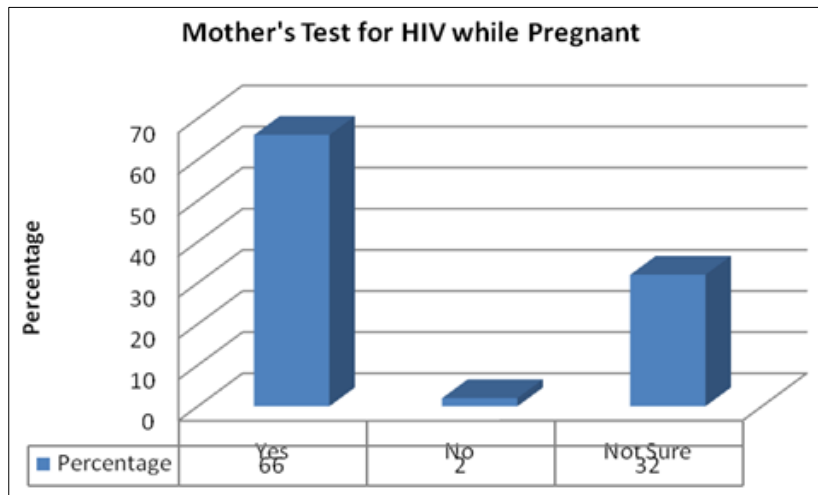


Source: Field data collected

Fig 14: Alcohol Intake by Respondent Mother/ Caretaker

Figure 14, shows that 76 percent of respondents sampled answered NO to the intake of alcohol while 24 percent of the respondent answered YES to the intake of alcohol. Slightly

more than one fifth of the respondents took alcohol during pregnancy

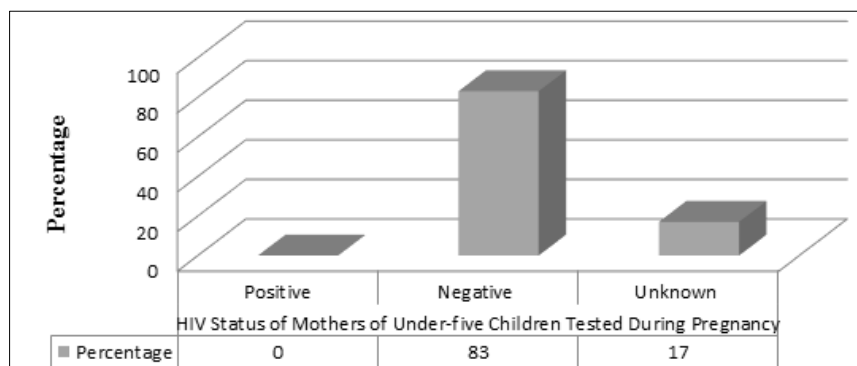


Source: Field data collected

Fig 15: Mother's Test for HIV while Pregnancy

According to figure 15, 66.0 percent of the respondents said they were tested for HIV during ANC consultation, 2 percent said they were not tested while 32 percent of the respondents

said they were not sure if they were tested because the test was not explained to them. The findings revealed that 34 percent of the respondents did not go through HIV test while pregnant.



Source: Field data collected

Fig 16: HIV Status of Mothers of Under-five Children Tested During Pregnancy

Figure 16 shows that 83.0 percent of the respondents were tested for HIV with negative result during ANC consultation, 17.0 percent of the respondents tested with unknown result while 0.0 percent positive result. None of the mothers sampled had HIV/ Ebola during pregnancy.

in children causes direct structural damage to the brain and impair infant motor development and exploratory behavior.

**Discussion of Findings**

**Nutritional status of under-five children**

The study revealed that almost half (48%) of the sampled under-five children in the Yemoh town community were found to be malnourished. Out of this 48 percent, 55 percent were females while 45 percent were males. A study in Bangladesh in 2009 reported that rates of malnutrition were higher in female children than male children<sup>[11]</sup> (Khan, Kraemer, 2009). Also, other studies show that at the national level, differences between under nutrition prevalence rate between young boys and girls are generally small. These studies are in agreement with the findings in Yemoh town community. Under nutrition

**Demographic Factor**

**Age Distribution of Mother at the Time of Birth**

20 percent of the respondents were less than 21 years at the time of birth. Infants born to young mothers who are not fully developed are found to have low birth weights<sup>[12]</sup> (Dewan, Manju, 2008). Low birth weight is one of the indicators of malnutrition.

**Socio-economic factors**

**Educational level of parents**

49 percent of the parents had little or no education which generates cycle of poverty. As a result such parents may find it difficult to even identify correct foods needed for their children because they cannot read the necessary feeding instructions such as breast feeding and best weaning foods.

### **Parent's Knowledge of Causes and Methods of Prevention of Malnutrition**

33 percent of the parents of the under-five children who reported to have lacked the knowledge of the causes of malnutrition and the 33 percent that also reported to lack the knowledge of the prevention of malnutrition was high. This may lead to inadequate food intake, infections, psychosocial deprivation, the lack of sanitation and hygiene, and social inequality may contribute to childhood malnutrition.

### **Breastfeeding Practices**

Although breastfeed is packed with diseases fighting substances that protect their babies from illness and breast feeding is the normal way of providing young infants with the nutrients they need for healthy growth and development such as vitamins, minerals and essential calories, 43 percent of the mothers sampled never gave adequate exclusive breastfeeding to their children. Exclusive breastfeeding for the first four to six months of life should continue to be promoted as the primary way to prevent vitamin A deficiency in young infants<sup>[13]</sup>. Inadequate breastfeeding may lead to malnutrition and childhood infection and mortality. Bruno de Benoist, José Martines, and Tracey Goodman (2001), recommended that

### **Frequency of complementary Feeding of Under-five Children per 24 Hours**

Out of 68 sampled under-five children whose frequency of complementary meals taken were investigated (0 – 24 months), 11 had adequate age appropriate feeding per day (i.e. 2 times at 6 months, 3 times from six to up to nine months, 4 times from nine to twelve months, and 5 times from twelve to twenty four months), while 57 had inadequate age appropriate feeding. The transition from exclusive breastfeeding to family foods should span from 6 months to 24 months. The frequency of complementary meals taken by the child per 24 hours should depend on the age of the child. If a mother is not knowledgeable about the age appropriate feeding practices, the frequency of meal, amount of meal, thickness of meal, and varieties of the food being given to the child, good hygiene practices, and responsive feeding habit may increase the chance of the under-five being malnourished.

### **Household's Employment Status**

Slightly above two fifth of the household heads were found to be unemployed. The relationship between unemployment and malnutrition could be explained by the fact that unemployment can led to poverty, which in turn lead to household food insecurity and insufficient access to food. Insufficient access to food can lead to inadequate dietary intake by the child, which can finally lead to child malnutrition. The high unemployment rate could also explain the high prevalence of malnourishment among the under-five children in the community.

### **Alcohol Intake by Respondent Mother/ Caretaker**

Slightly more than one fifth of the respondents took alcohol during pregnancy. Intake of alcohol reduces the immune system and cause anorexia (poor appetite) which may lead to malnutrition of the mother and the unborn child. When such children are delivered they may develop mental retardation or fail to thrive.

### **Parent's Marital Status**

Slightly above half of the mothers of the under-five children reported living alone. It will be very difficult for a single parent bringing up a child to meet that child's nutritional and other basic needs. However, if there is a help mate, such needs could be shared by both. Also, both parents living together may influence the growth of the child physically, psychologically, and emotionally.

### **Health-related factors**

#### **Antenatal Clinic Consultation**

One fifth of the respondents did not or was not sure to have attended antenatal clinic consultation up to 3 times. Not attending antenatal clinic consultation means they were not assessed for HIV, Ebola, malaria, syphilis, their hemoglobin not tested and did not get health talk on nutritional foods, early and exclusive breast feeding which if not followed might lead to early malnutrition of children.

#### **Immunization status**

Although Immunization boosts up the immune system of the child through both passive and active immunization, about one fifth of the sampled under-five children were not fully immunized. If they are not fully immunized for the dates they will be at high risk of getting vaccine preventable diseases such as measles, diarrhea, whooping cough, tetanus and diphtheria, and other diseases as a result of low immune systems.

#### **Vitamin A supplementation**

35 percent of the under-five children were not up to date for the vitamin A supplementation. Severe vitamin A deficiency, may cause blindness, reduce immunity and increase the severity of infections, while iron deficiency can lead to anemia. In Sierra Leone, nutritional deficiencies are considered one of the leading causes of mortality and morbidity<sup>4</sup> (DESA 2012).

#### **Institution where child was delivered**

About one third of the sampled under-five children were not delivered in health care institutions which may put them at risk of developing neonatal tetanus, hypoglycemia as a result of poor environment, unclean delivery surfaces and unsterilized instruments used by Traditional Birth Attendants (TBAs) and other untrained and unqualified birth attendants which may eventually lead to early child malnutrition and mortality.

### **Conclusion**

The result of this study indicates that child malnutrition in Yemoh Town community is becoming worrying and requires multi-disciplinary and multi-level actions to combat the situation. This study has discovered that there is basic underlying and immediate causes that act at various levels in society which contributed to the occurrence of child malnutrition in this community. There is a need for prompt intervention to prevent child malnutrition in the community by addressing all the factors.

### **Recommendations**

Based on the research finding the following recommendations are made:

- The Government of Sierra Leone and the local authorities in Bo city should join hands to provide more employment

in the district to reduce the unemployment rate, which is driving child malnutrition in the communities.

- Health Education should be reinforced at all levels of health care service institutions and communities to improve parent's knowledge of the recommended infants and child feeding practices.
- The District Health Management Team (DHMT) should strengthen the implementation of vitamin A supplementation in all health care services institutions and outreach service through on the spot check and supportive supervision of all health services delivery point within and around the City of Bo.
- Similar research should be conduct by other researchers on a large sample size of under-five children to detect the effect of some of the factors that could not have been observed by the present research.
- The Ministry of Health and Sanitation in collaboration with Ministry of Social Welfare Gender and Children's Affairs should put in place measures to intensify the campaign against early child marriage and teenage pregnancy to reduce the number of girls who get pregnant under the age of less than 21 years.

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