

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND
TECHNOLOGY, KUMASI

COLLEGE OF HEALTH SCIENCES
DEPARTMENT OF COMMUNITY HEALTH

NUTRITIONAL STATUS OF STATUS OF PRE-SCHOOL CHILDREN;

A COMPARATIVE STUDY OF TWO COMMUNITIES

IN SAVELUGU-NANTON DISTRICT

NORTHERN REGION

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A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES, KWAME NKRUMAH UNIVERSITY OF
SCIENCE AND TECHNOLOGY, IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF
MASTER OF SCIENCE IN HEALTH EDUCATION AND HEALTH PROMOTION



DECLARATION

I hereby declare that, except for the references to other people’s works, opinions and observations which have been duly acknowledged, this work is the result of my own original research.

I hereby declare that, this work has neither in whole nor in part been presented for a degree elsewhere.

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DEDICATION

This piece of work is dedicated to the entire family for unflinching love and support during the period of my absence from home.

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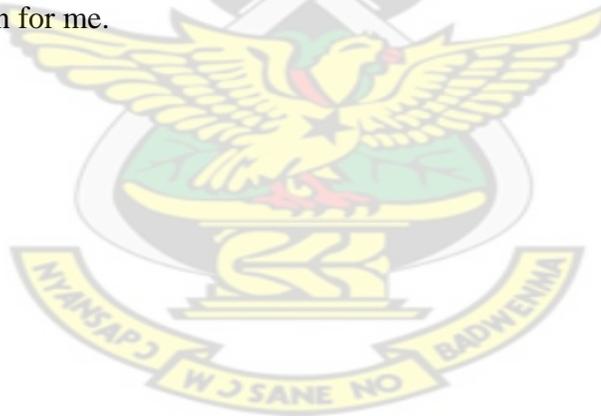
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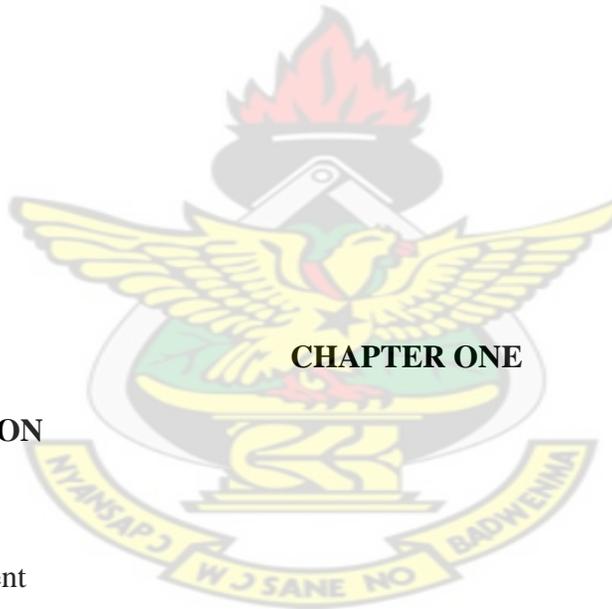
ABBREVIATIONS

| | |
|--------|--|
| CHPS | Community -based Health Planning Services |
| CRS | Catholic Relief Services |
| CWC | Child Welfare Clinic |
| DHA | District Health Administration |
| DHMT | District Health Management Team |
| GDHS | Ghana Demographic and Health Survey |
| GHS | Ghana Health Service |
| GSS | Ghana Statistical Service |
| IMCI | Integrated Management of Childhood Illnesses |
| MDG | Millennium Development Goals |
| MOH | Ministry of Health |
| NCHS | National Center for Health Statistics |
| NGO | Non-Government Organization |
| P E M | Protein Energy Malnutrition |
| RCH | Reproductive and Child Health |
| SCN | Standing Committee on Nutrition |
| TZ | Tuo-Zaafi |
| UNICEF | United Nations International Children's Education Fund |
| WFP | World Food Programme |
| WHO | World Health Organization |

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ABSTRACT

A well-nourished child is one whose weight and height measurements compare very well with the standard normal distribution of heights and weights of healthy children of the same age and sex. The study was conducted in two communities all the 160 children aged between 6 and 23 months were assessed in Savelugu/ Nanton District in the Northern Region of Ghana during the year 2007.

The main objective was to compare nutritional Status of children 6-23months in two communities, one with food supplementation, and the other without the intervention.

The study was a comparative study using a structured questionnaire and measurements of weight and height.

Participants were recruited in July, 2007 using purposive and random sampling procedures. A structured questionnaire was administered to mothers in their home setting.

Information on child health, socio-economic status of parents, childhood illness, mothers' knowledge in nutrition and weaning practices, cultural practices that affect complementary feeding and anthropometric measurement of children were gathered.

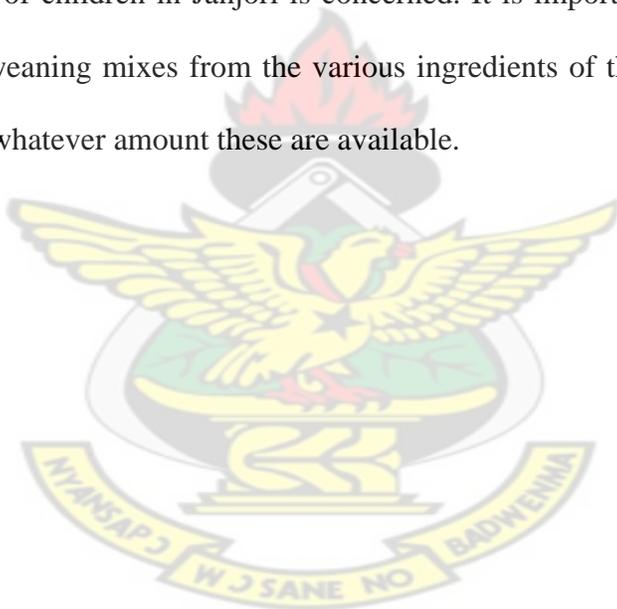
Reference standards used were those of the National Center for Health Statistics NCHS standards for weight for age was utilize to classify children in various grades of nutritional status.

We found that the ignorance of mothers (94% had no education) about good nutrition is affecting the prevalence of infection and under nutrition.

The level of childhood illness (malaria) was very high in both communities, 58% in Janjori and 81% in Nyoligu. Mothers did not meet the recommendation of WHO on the initiation of complementary feeding at 6 months as they introduced food at 4weeks. Corn-based food

accounts for almost 90% of the food consumed by the children. Sixty-four percent (64%) children in Janjori and 68% in Nyoligu were underweight (W/H). There was no statistically significant difference as far as underweight was concerned in the two communities. (Chi square= 1.3; df=1; p-value=0.03)

There was no difference with respect to nutritional status of children in both communities (p-value=0.02). The null hypothesis of no difference between the two communities cannot be rejected. The food supplement therefore has not made any impact as far as the nutritional status of children in Janjori is concerned. The food supplement therefore has not made any impact as far as the nutritional status of children in Janjori is concerned. It is important to teach mothers how to prepare nutritious weaning mixes from the various ingredients of their farm output and add vegetables and fruit in whatever amount these are available.



CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND INFORMATION

Nutrition is the sum total of the processes involved in the intake and utilization of food substances by living organisms, including ingestion, digestion, absorption, transport and metabolism of nutrients found in food.(Melvin, 2005).

Adequate nutrition during early childhood is fundamental to the development of each child's potential. It is established that the period from birth to two years of age is a "critical window" for the promotion of optimal growth, health and overall survival of children (Ali, et al 2006).

Good food is important for good health. Children who are well fed during the first two years of life are more likely to stay healthy for the rest of their childhood. During the first six months of a child's life, breast milk alone is the ideal food. It contains all the nutrients needed for healthy growth as well as immune factors that protect against common childhood infections (Ashworth, 2002).

Good nutrition is the cornerstone for survival, health and development for current and succeeding generations. Well-nourished children perform better in school, grow into healthy adults and in turn give their children a better start in life (UNICEF, 2006). The United Nations Children's Fund (UNICEF) and the Ministry of Health (MoH), Ghana recommend exclusive breastfeeding for the first six months of the infant's life. Children between the ages of six months and four years who do not get enough of the right types of food to eat easily become malnourished

According to UNICEF (2006), each year under-nutrition contributes to the deaths of about 5.6 million children under- 5 in the developing world and 146 million children younger than 5 are underweight and at increased risk of early death, illness, disability, and underachievement. UNICEF reports that, in the least developed countries, 42% of children are stunted and 36% are underweight as a result of poor nutrition or under nutrition.

The World Health Organization (WHO) refers to malnutrition as “Failure of cells to perform their physical functions due to inability to receive and use the energy and nutrients needed in terms of amount, mix and timeliness. Waterlow and Insel (1995) described malnutrition as “Failing Health that results from long standing faulty nutrition that either fails to meet or greatly exceeds nutritional needs. This description could mean inappropriateness of the food taken. Again, Harrison and Waterlow (1990) defined malnutrition as “The effects of any nutrient deficiency including energy, protein and micronutrients.”

Malnutrition can be operationally defined as a lack of essential nutrients or failure to use available foods to best advantage (Barasi, 1997). Malnutrition affects physical growth, morbidity, mortality, cognitive development, reproduction and physical work capacity and it consequently impacts on human performance, health and survival. A well-nourished child is one whose weight and height measurements compare very well with the standard normal distribution of heights and weights of healthy children of the same age and sex (Salah, 2006).

In this perspective, malnutrition is not less food or food without the needed nutrients present. It is rather the failure of cells to perform their physiological functions due to inability to receive and use the nutrients in the right proportion.

Malnutrition especially among young children is a widespread problem in most developing countries. Over one hundred million children less than five years of age suffer from protein-energy malnutrition and more than ten million of them suffer from severe protein energy malnutrition, which is usually fatal if untreated (WHO, 1981).

Malnutrition refers to disorder resulting from an inadequate diet or failure to absorb or assimilate dietary elements (Jackson, 1975).

Malnutrition may involve undernutrition and include the symptoms of deficiency diseases or it may be due to overnutrition arising from excessive intake of nutrients (Barasi, 1997). In the case of children under two years they suffer mostly from undernutrition specifically, protein-energy malnutrition. The African Region has the highest estimated prevalence of stunting (48.1%) and has the lowest rate of improvement (20%) (Vlok, 1991). Under-nutrition and under-nourishment also refer to a condition where there is insufficient intake of food to cover energy and nutrient needs. Insufficient intake of food that results in malnutrition could be attributed to varied reasons (Morley and Woodland 1992).

Under-nourished children have lowered resistance to infection; they are more likely to die from common childhood ailments like diarrhoeal diseases and respiratory infections, and for those who survive, frequent illness saps their nutritional status, locking them into

a vicious cycle of recurring sickness and faltering growth. Their plight is largely invisible; three quarters of the children who die from causes related to malnutrition were only mildly or moderately undernourished, showing no outward sign of their vulnerability (UNICEF, 2006).

In Asia, the prevalence of stunting (32.8-43.7%) is high, particularly in south and central Asia, although rates of stunting continue to improve throughout this region. In a review of mortality and morbidity trends in Bangladesh between 1970 and 1975 by Hussain (1987) it was found that the crude mortality rate, the infant mortality and the childhood malnutrition rate fell and rose with improvement and deteriorations in food supply that were largely determined by political, economic, climate and social factors.

The importance of addressing childhood malnutrition is a prerequisite for achieving internationally agreed goals to reduce malnutrition and child mortality. Child growth is therefore internationally recognized as an important public health indicator hence growth monitoring centers are established in all communities.

In Ghana malnutrition rate among children under-two years recorded 2.7% in 2003, 5.4% in 2004, and 7.5% in 2005 (GHS, 2005). The Ghana Health Service Nutrition unit collaborates with the WFP in executing a food supplementation programme in five regions of the country where malnutrition rates are considered especially acute. The five regions are Central, Brong-Ahafo, Northern, Upper East and Upper West Regions. Under this programme food rations are distributed to pregnant and lactating women as well as

children 1-3 years of age at the feeding centres in selected communities during periods of the year when food is particularly scarce. Centre attendants who have been trained to conduct growth monitoring also educate mothers on basic nutrition and hygiene.

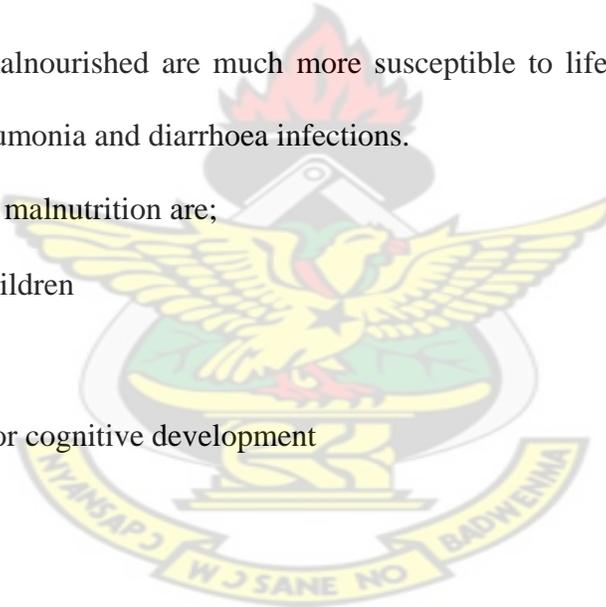
The Millennium Development Goal 4 (MDG 4) is aimed at ensuring child survival and a reduction in malnutrition among children under five by at least one third and to reduce mortality by 2/3 by the year 2015 with special attention to children less than two years of age. (UNICEF, 2006)

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Children who are malnourished are much more susceptible to life-threatening diseases such as malaria, pneumonia and diarrhoea infections.

Complications from malnutrition are;

- Anemia in children
- Convulsions
- Poor mental or cognitive development
- Stunting



1.2 STATEMENT OF PROBLEM

Malnutrition situation in Ghana is a serious public health problem among pre-school children. About 3 out of every 10 young children are undernourished. Nearly 2 out of every 10 babies born die before their 5th birth day. Undernutrition is an important cause of death (MoH 1995)

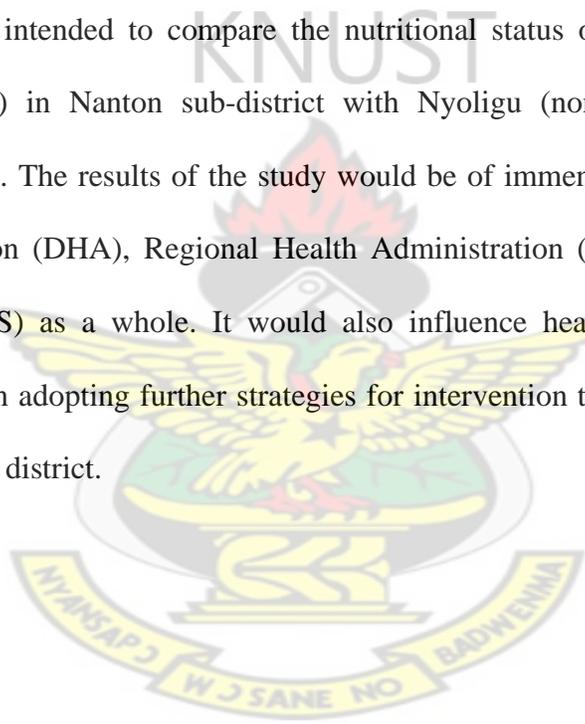
According to the Reproductive and Child Health (RCH) annual report, (2005) among children registered at Child Welfare Clinics, malnutrition rates have been increasing over the years. In children 0-11months, about 4.1% of children were found to be malnourished. This shows an increase when compared with 2.6% in 2004. Among children 12-23 months, 7.5% were malnourished as compared to 5.4 in 2004.

The 1998 Ghana Demographic and Health Survey (GDHS) shows that under-nutrition is significant in Ghana with one in four Ghanaian children less than five years of age being stunted (short for their age) 10 % wasted and 25% under weight. The Survey revealed that, in general children residing in the three northern-most regions of Ghana (Northern, Upper West and Upper East Regions) and children of uneducated mothers are more likely to be malnourished.

Savelugu /Nanton district is one of the eighteen districts in the Northern Region of Ghana. A 2003 baseline survey conducted by the District Health Management Team (DHMT) revealed that 38.5% of children underweight, 33.8% were stunted and 35.3% were wasted. These figures are higher than the findings of GHS annual report 2004 and unacceptable.

1.3 RATIONALE FOR THE STUDY

Undernutrition is a major public health problem and the World Food Programme (WFP) through the Savelugu-Nanton District Assembly has initiated food supplementation to help address the problem in Janjori Kukuo and some other communities in the district. What is unknown is whether the intervention resulted in significant changes in nutritional status when compared with other communities that received the routine services. This study therefore was intended to compare the nutritional status of children in Janjori-Kukuo (intervention) in Nanton sub-district with Nyoligu (non-intervention) in the Savelugu sub-district. The results of the study would be of immense help to the District Health Administration (DHA), Regional Health Administration (RHA) and the Ghana Health Service (GHS) as a whole. It would also influence health partners including UNICEF and WFP in adopting further strategies for intervention to improve nutrition of children in the whole district.



1.4.1. Null Hypothesis

1. There is no difference in disease conditions among the children in the two communities.
2. There is no difference in the level of knowledge of mothers in adequate nutrition in the two communities.
3. There is no difference between the nutritional status of children under-2 years in Janjori-Kukuo and Nyoligu communities

1.5. RESEARCH QUESTIONS

- What is the difference in the cultural factors towards complimentary feeding in the two communities?
- Is there a difference in socio-economic status of parents of these children in the two communities?
- What is the difference in disease conditions affecting children in the two communities?
- What is the difference in level of knowledge related to mothers' knowledge in adequate nutrition in the two communities?
- Is there a difference in nutritional status of children under-2 years in the two communities?

1.6.1 MAIN OBJECTIVE

To compare the nutritional status of children under two years in Janjori-Kukuo with those in Nyoligu.

1.6.2 SPECIFIC OBJECTIVES

1. To determine whether there is a difference in cultural taboos related to complimentary foods in the two communities.
2. To determine the difference in socio-economic status of parents of these children in the two communities
3. To identify the difference in diseases affecting children in the two communities.
4. To compare the level of knowledge of mothers in child nutrition
5. To measure using anthropometric indicators the nutritional status of children under-two in Janjori-Kukuo and Nyoligu respectively.
6. To make recommendations to programme implementers with the view to improve the programme implementation

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

The study sought to compare the nutritional status of children under-two years in two communities (Janjori-Kukuo, and Nyoligu,) in Savelugu- Nanton district. The literature was reviewed based on the objectives of the study.

2.2 CULTURAL FACTORS

Food consumption in developing countries is still strongly influenced by complex socio-cultural factors affecting food behaviour, including customary systems of food sharing within the family, cultural attitudes towards various foods, food preparation methods and child rearing practices (Maletnema, 1978).

Linkages Ghana, a Non-Governmental Organization (NGO) sponsored by USAID has over the years contributed tremendously towards the behaviour change of people particularly in the three northern regions against traditional and cultural practices that militate against appropriate complementary feeding. (Linkages,2000). It has been established by Armar-Klemensu (1995) that feeding styles employed in most rural northern communities are either by hand, cup and spoon, bottle or calabashes. Children eat in communal group depending on the age and sex.

According to Linkages (2004) most mothers enrich infant meals with fish powder, groundnut paste, oil, eggs and 'dawadawa' among others even though this good dietary practice is not very popular among the poor rural women.

Qualitative evidence indicates that position as the head of a household and income-earning members receive preference in food sharing and take the best part of the food. In some traditional societies it is common for the youngest and weakest children to be at a further disadvantage in family food sharing (Maletnema, 1978).

Another study conducted by Ghana Sustainable Change Project (GSCP) in 2006 showed that there were no firm rules to the frequency of feeding children on complimentary foods in northern Ghana. Mothers and caregivers are often of the opinion that children should be fed as many times as the child wants while others maintain that it should be four times daily. According to Beaver et al (2002) each region or country has developed its own local diet over many years. Diets have evolved based on available foods which in turn depend on climate, geography, agricultural patterns, as well as social factors such as religion, culture, class, and lifestyle. Each diet contains a balance of essential nutrients.

A well-balanced diet which includes a variety of food will provide all the vitamins and minerals required for the efficient functioning of the body. It is only when diet becomes restricted in illness or because of food shortages or poor choice of foods that shortages of essential vitamins and minerals will occur (Beaver et al, 2002).

2.3 SOCIO-ECONOMIC STATUS

A World Food Programme (WFP) survey conducted in 1987 in Ghana shows significant correlation among three indicators of malnutrition and a number of variables relating to income, food supply, environment, social and health status. A high socio-economic standing of a house-hold will determine the nutritional status of a child.

The level of income is by far the greatest single cause of variability in food intake although income is not the only measure of poverty. Many other social and environmental factors contribute to malnutrition and are closely linked to the poverty levels of individuals and countries (Lipton and de-Kadt, 1998).

In developing countries income from home-produced food and payment received in kind are generally more important than cash income in the determination of food availability in a household in a rural community, however, food availability is determined primarily by cash income (Lipton and de-Kadt, 1998). According to De Boer (2000), meals in most northern communities (Northern, Upper East and Upper West) are known to be either monotonous with hardly any variety or are low in terms of protein and micronutrient contents.

The nutritional status of a person depends largely on the quantity and quality of food available on the market, purchasing power of the household that would determine the accessibility to food and the distribution of food within the household.

Although food intake influences the nutritional status of an individual to a great extent it is not the only critical factor responsible for malnutrition particularly in the case of children under five years of age. Living standards, water and sanitation, birth weight, birth interval, parity, sex of child, weaning practices and mothers certification are a few of the important contributory factors which have been identified from research stages carried out on the subject in the recent past, However, dietary inadequacy is certainly the basic cause of malnutrition in pre-school children and many of the above identified factors directly or indirectly contribute to the incidence of malnutrition (Raheela, 1994).

2.4 Diseases and infections

Under-nourished children often come from poor families, with crowded houses and poor hygiene, so they are exposed to more infections. Micro-organisms are more likely to get into the child's body and multiply in it. The immune system is less able to fight infection in an under nourished child than it is in a healthy child (Morley and Woodland, 1992).

Dewey et al in 1999, revealed that exclusive breastfeeding provides protection against mild upper respiratory tract infections, inflammation of the middle ear, urinary tract infections, bone and joint infections and diarrhoeal illness.

Malnutrition is a multisystem disorder when severe, immunity is impaired, wound healing is delayed and operative morbidity and mortality increased. Malnutrition worsens the outcome of illness, example; malnourished children are susceptible to diseases and more apathetic. These behavioural abnormalities are rapidly reversed with proper

feeding, but prolonged and profound malnutrition probably does cause some permanent delay in intellectual development (Clayden and Lissaurer, 2005).

The WHO expressed concern about the vast numbers of infants and young children who are still inappropriately fed and whose nutritional status, growth and development; health and survival are thereby compromised. As much as 55% of infants who die from diarrhoeal diseases and acute respiratory infections may be the result of inappropriate feeding practices.

Usually during sickness such as malaria, measles and diarrhea the child loses appetite. Therefore, inadequate food intake due to loss of appetite and poor absorption of the food eaten are the reasons why children who fall sick often do not grow well (Stanfield, 1999). Undernourished children have lowered resistance to infection; they are more likely to die from common childhood ailments like diarrhoeal diseases and respiratory infections, and for those who survive, frequent illness saps their nutritional status, locking them into a vicious cycle of recurring sickness and faltering growth. Their plight is largely invisible: three quarters of the children who die from causes related to malnutrition were only mildly or moderately undernourished, showing no outward sign of their vulnerability (UNICEF, 2006).

2.5 Mother's Knowledge in child nutrition

A comparative assessment of a nutritional education in growth programme in India showed that counseling of mothers on feeding practices showed improved feeding practices even in areas where females are discriminated against (Ghosh et al, 2002).

A cross-sectional study was conducted at the Lefaragatha village of Bophuthatswana, South Africa to document the prevalence and risk factors for malnutrition in children aged 0-5 years in June 1991. Fifty-four households, in which there were children in the right age groups, were interviewed over three weeks. Of these children, 14 (25.9%) were below the 3rd percentile of weight for age (National Centre for Health Statistics standards in South Africa, 1991). In the age group of 2 years and less, this figure was 28.6%, while in children older than 2 years the corresponding figure was 71.4%. Malnutrition was associated with a mother's lack of resources such as water and inappropriate staple diet. Education and income were significant variables.

In a study carried out by Sanjay (2002) in Nepal, he concluded that a traditional food made by mothers has been shown by scientists to be very nutritious. The porridge is made from a finely ground flour of roasted cereal grains and pulses. The mixture is known as super flour or 'Sarbotam pitho ko lito'. Some of the advantages of the super flour include its convenience and adaptable food storage. The flour can be used for baking bread and biscuits. Mashed vegetables and fruits can be added to the porridge to improve the nutritional value and vary the flavour. This is highly recommended for use with severely malnourished child.

In 1979 the World Health Organization and the United Nations Children's Fund (UNICEF) recommended an exclusive breastfeeding (EBF) period of 4-6 months however a WHO expert committee in 2001, upon assessing the extent of EBF concluded that for optimal nutritional status of a child, an EBF period of 6 months must be adhered to. The first six months of life are extremely important as the brain may suffer for the rest

of life if the child does not get enough good food. At age six months of the child, breastfeeding should be complemented with appropriate solid foods. By this age, the gastro-intestinal functions are adequate to deal with the weaning foods while the kidneys can easily handle the solute load especially under conditions of low fluid intake.

In Nigeria ten variables that influence the under-five nutritional status at Oranfe, a semi-rural community in Ife East Local Government Area of Ogun State, Nigeria were assessed. The two types of protein-energy malnutrition (PEM) that are prevalent in the community are stunting and wasting. Of the 230 children assessed using Waterlow's technique, 23% and 22% were stunted and wasted respectively. The results confirmed that mother's educational level, age, parity; types of family and children's immunization status and age of child are some of the key determinants of the nutritional status under five. The intensification of exclusive breastfeeding, female education, compulsory food demonstration unit in all health centers, use of complementary feeds from 7 months upward, growth monitoring and promotion are some of the strategies to reduce the high prevalence of PEM in both rural and urban areas of developing countries (Ojofeitimi, 2003).

Studies on infant and child feeding practices conducted by Linkages (2004) in the Northern Ghana showed that the food often offered to this category of children is unfortified, plant based and bulky. These foods thus, fail to meet their needs for certain micro nutrients particularly, iron, zinc, calcium and vitamins. In another study conducted

in Northern Region by Catholic Relief Service (CRS) on the rate of malnutrition, the findings were;

Table 2.1 Nutritional status in 3 Northern Regions

| | Underweight | Stunting | Wasting |
|-------------------|-------------|----------|---------|
| Northern Region | 35.5 | 48.8 | 6.6 |
| Upper East Region | 32.4 | 31.7 | 12.9 |
| Upper West Region | 25.9 | 34.1 | 11.0 |
| Ghana | 22.1 | 29.9 | 7.1 |

Source: CRS, (2006)

This was attributed to inappropriate feeding practices. They concluded that to address childhood malnutrition, there should be an improvement of complementary feeding. (Ali et al, 2006).

In a comparative study carried out in children on nutritional and growth difference in Southern New Jersey States of America, there was little difference in growth between Hispanic and white youths. Children were assessed with the use of the Centers for Disease Control's nutritional surveillance cut points; less than 5% of each ethnic group fell below the fifth percentile, according to the National Center for Health Statistics' weight-for-height standards. White and Hispanic youths were twice as likely as blacks to fall below the 5th percentile for stature or to be overweight (above the 95th percentile for weight-for-height). Compared with black girls, white and Hispanic girls were three to four times more likely to fall below the fifth percentile for stature.

Anthropometric measurements provide one of the most important indicators of a child's nutritional status. In combining the infant's spine length, weight and age data, three

indices of physical growth used in describing children's nutrition status are height for-age, weight-for-age and weight for height. In all the indicators, the standard deviation 2 and -3 are referenced as malnourished and severely malnourished respectively. Height for -age determines level of stunting; weight-for-age for the level of underweight and; weight for height for assessing wasting (WHO, 2000).

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CHAPTER THREE

3.0 METHODOLOGY

3.1 STUDY METHODS AND DESIGN

Analytical cross sectional study design was used in a comparative analysis conducted in two communities in the Savelugu-Nanton district. The study covered a period of three months; June to August 2007.

3.2 DATA COLLECTION METHOD

Both qualitative and quantitative techniques were employed to collect data

A questionnaire was to obtain data from mother-child pairs. The anthropometric measurements were obtained using an infantometre, a tape and a Salter spring and followed the procedures as recommended by the National Center for Health Statistics (NCHS), Ghana.

3.3 STUDY POPULATION

Mother and child pairs in the District formed the study population representing the selected communities. A mother with a child under-2 years who has lived in the community for at least 2 years was considered eligible to be enrolled for the study.

3.4 DISTRICT PROFILE

3.4.1 Location:

The Savelugu/Nanton district is one of the districts carved out of West Dagomba in 1988. The district is about 1,760 square kilometers and shares boundaries with the Tamale Metropolis to the South, Gushegu/ Karaga district to the east, West Mamprusi to the North and the Tolon /Kumbungu district to the West. The population of 106,284 is mostly rural and resides in 136 communities. This population is predominantly made of the youth and less than 15 years of age constitute as high as 49% of residents (UNICEF 2000). The provision of social amenities such as education and health therefore has to take into consideration the youthful structure of the population.

3.4.2 Ethnicity.

The Dagomba ethnic group pre-dominantly inhabits the area with a few other tribes from other parts of the country who are working in government departments and agencies.

3.4.3 Religion.

A Socio-cultural and religious norm in the communities of the districts vests most authority in the hands of chiefs, religious leaders and clan heads that are mostly male.

The system of inheritance is patrilineal thus making women more dependent on men for resources. Women are therefore disadvantaged in terms of access to education, health and other social amenities in relation to men though they face the same levels of poverty. The females comprise 51% of the population and 49% are male. However, only 3.1% of household heads are women.

3.4.4 Geography:

Two major rivers, the Volta and Nasia run through the district with numerous streams feeding into these rivers. Most of these streams dry up after the rainy season making it difficult for the inhabitants to have water for their activities. The vegetation is Savannah Grassland and the land is low-lying. There are two seasons, which characterize the climate in the district and these are the rainy season, which is from May to October and the dry season is from December to March when the North Westerly Harmattan Winds are most prominent.

3.4.5 Road/Transport.

A greater portion of the district is accessible to transport throughout the year except the Kudanali area in the Pong Tamale sub-district due to flooding from the Volta river and some streams. Telephone and postal facilities exist between Savelugu and other parts of the country.

3.4.6 Education:

The Pong-Tamale Veterinary College is the only post – secondary institution in the district. The basic educational system has 76 public primary schools, 3 private primary schools, 19 junior secondary schools, 2 senior secondary schools and 1 specialized school for the deaf and dumb. There are 44 public and 13 private nurseries, which cater for children of pre-school age. Non – formal education is undertaken in various communities by non-governmental organizations and the Ghana education service. The level of

illiteracy is high with dropout rate being higher amongst girls than boys. Gross enrollment is 46% but 56% for boys and 35% for girls. Dropout rate is 7.7% for boys and 12.1% for girls.

3.4.7 Social Amenities:

A few communities enjoy electricity from the national grid and only the district capital is supplied with potable water from a small town water system. The Diare and Nanton communities have mechanized water systems. A large number of communities continue to use water from dams and boreholes. There are 53 boreholes 212 hand-dug wells and 45 dams, which are sources of water for the people in the district. The water and sanitation system in the district also has over 600 KVIPs, 115 water closets and 28 rubbish dumps.

3.4.8 Health Infrastructure:

There is one operational CHPS zone at Pigu at the northern part of the district, which serves seven communities. Health centers are located in Nanton to the east and Pong Tamale and Diare to the north. Three communities are located at Moglaa, Janjori-Kukuo and Tampion. Bruham Clinic is privately owned and operates in Savelugu. The New Life Laboratory is in partnership with the Savelugu Hospital and offers services to the hospitals and health centres on absolute basis. The Savelugu Hospital is the only facility providing in-patient care services and at the same time referrals centre for the rest of the facilities.

MAJOR HEALTH INDICATORS:

The institutional Maternal Mortality Ratio is 308/100,000 live births and the infant mortality rate using the community-based surveillance system is 5/1000 live births. The department of births and deaths recorded 3,596 births and 124 deaths for the year 2006. The major diseases of concern are guinea worm, malaria, diarrhoeal diseases and acute respiratory tract infection

Table 3.1

TOP TEN CAUSES OF DEATH SAVELUGU HOSPITAL JAN-DEC 2006

| NO | CONDITION | NUMBER | PERCENTAGE |
|----|--------------|--------|------------|
| 1 | Malaria | 90 | 66 |
| 2 | Anemia | 9 | 7 |
| 3 | Pneumonia | 9 | 7 |
| 4 | Convulsion | 9 | 7 |
| 5 | Hypertension | 5 | 4 |
| 6 | Sepsis | 5 | 4 |
| 7 | Septicaemia | 3 | 2 |
| 8 | Dehydration | 3 | 2 |
| 9 | URTI | 2 | 1 |
| 10 | Hepatitis | 2 | 1 |
| | Total | 137 | 100 |

Source: Savelugu District Hospital (2006)

According to the District Health Reports (2006) the ten top causes of death in the hospital were Malaria 90(66%), Anaemia 9 (7%) Pneumonia 9 (7%) Convulsion 9 (7%), Sepsis 5 (4%) Hypertension 5 (4%) Septicaemia 3 (2%) Dehydration 3 (2%), URTI 2(1%) and Hepatitis 2(1%) In all total deaths were 137.

Table 3.2 Staff Strength

| STAFF CATEGORY | NUMBER |
|-------------------------|--------|
| Senior medical Officer | 2 |
| Health promoter | 1 |
| Public Health Nurse | 2 |
| Medical Assistants | 3 |
| Midwives | 8 |
| General Nurses | 4 |
| Community Health Nurses | 11 |
| Disease Control Officer | 3 |
| Store Keeper | 1 |
| Accountants | 2 |
| Total | 37 |

Source; Savelugu District Health Service 2006

REPRODUCTIVE AND CHILD HEALTH CARE SERVICES

The District ensures the delivery of health care services in the area of reproductive and child health by providing the following health care services at the district and sub-district level.

- Antenatal Care
- Postnatal Care
- Family Planning
- Child Growth Monitoring
- E.P I
- Home Visits
- Health Education
- School Health Services.

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COLLABORATORS

The district has some partners in development they are;

- World Vision International
- Canada Children's Fund of Canada (CCFC)
- UNICEF
- World Food Programme

3.5. STUDY VARIABLES

Table 3.3

| VARIABLE | INDICATOR | OPERATIONAL DEFINITION | SCALE OF MEASUREMENT |
|--------------------------|--|--|---|
| 1. Nutritional status | Anthropometric indices | 1. Weight for age 2. Height for age 3. Weight for height | Ordinal: Median normal weight -1 SD Mild underweight -2SD Moderately underweight -3SD Severely underweight Ordinal: Median normal height -1 SD Mild stunted -2SD Moderately stunted -3SD Severely stunted Ordinal Median normal thinness -1 SD Mild wasted -2SD Moderately wasted -3 SD Severely wasted |
| 2. Level of knowledge | Response to questions | | Ordinal Good knowledge: 50%-100% Correct answers Poor knowledge: Below 50% |
| 3. Complementary feeding | Age at which complementary feeding is introduced | Age in completed months | Ratio: 4 weeks 4-12 weeks 12-24 weeks 24-52 weeks |

3.6. SAMPLING TECHNIQUE AND SAMPLE SIZE

3.6.1 Sample Size

Based on the assumption that the prevalence rate for malnutrition in the two communities is 12% and 10% in Nyoligu and Janjori respectively, with a desired 95% confidence interval and a standard error margin of 5% the sample size for each community was calculated as;

n = sample size

$P_1 = 12\%$ (Prevalence rate of malnutrition in Nyoligu)

$P_2 = 10\%$ (Prevalence rate of malnutrition in Janjori-Kukuo)

$e_2 = 5^2$ (required size of standard error)

$$n = \frac{P_1(100-P_1) + P_2(100-P_2)}{e_2}$$

$$= \frac{12*88 + 10*90}{25}$$

$$= \frac{1,056 + 900}{25}$$

=78.25 the sample size for each community was 78. For convenience 80 child-mother pairs were used for each community.

3.6.2 SAMPLING TECHNIQUE

Simple random sampling was used to select a community with the intervention and a community without the food programme intervention. The communities were Janjori Kuku (food supplement community) in Nanton sub district and Nyoligu (routine community) in the Savelugu sub district. Communities with food supplements were randomly selected through balloting. Names of communities were written on pieces of paper and placed in a box. The box was shaken and a paper with Janjori community picked randomly. The same procedure was done in the communities without the food supplements and Nyoligu was selected.

Random sampling was used to select 80 mother-child pairs in each community. The ages of the children recruited ranged between 6 and 24 months. At the food centre mother-child pairs who fell within this range were selected and informed about the anthropometric measures to be taken the following day in Janjori. At Nyoligu child welfare clinic, mother-child pairs who qualified for the study and opted to partake were made to stay back after growth monitoring for the measurements.

3.7. PRE-TESTING

The structured questionnaire and anthropometric instruments were pre-tested in similar communities; Kanshegu (food supplement community) and Pong (routine community), which were not part of the study communities and the tools were fine-tuned before going to the field for final field work.

3.8. DATA HANDLING AND ANALYSIS (STATISTICAL METHODS)

Three data collectors and a supervisor were trained and supervised on the interpretation of the questions in the predominant local dialect (Dagbani). A proficient assistant checked data collected for correctness and completeness before entry into the computer. The data were entered and analyzed with the Statistical Package for Social Scientist (SPSS) version 11 and Epi info Software. The results were presented in tables, graphs and charts.

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3.9 ETHICAL CONSIDERATION

Permission was sought from the District Chief Executive (DCE) and local chiefs in the study areas. Households were asked for consent to be granted for mothers who fell within the sample frame. All subjects were at liberty to participate in this study or otherwise. The consent of the respondents was sought verbally and they were assured of confidentiality. The study results were produced on community basis without reference to individuals who participated in the study.

3.10 LIMITATIONS OF STUDY

Due to financial and time constraints only one intervention and one control community were selected for the study.

Understanding of the questionnaire was limited by translation in Dagbani.

3.11 ASSUMPTIONS

The following assumptions were made while carrying out the research.

1. the sample size chosen represented the study population
2. Responses from the participants represented the true situation on the ground.
3. Measurements taken with the measuring tape and the Salter scale were precise

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CHAPTER FOUR

4.0 RESULTS AND ANALYSIS

This chapter covers the results and analysis of the study. It is presented according to the specific objectives of the study. The results are shown in tables and charts. In all 160 respondents (i.e. 80 from each community) were interviewed. The communities were Janjori- Kukuo and Nyoligu.

4.1 Background of mother and child pairs in Janjori-Kukuo and Nyoligu

Table 4.1: Background variables of study population

| Number of children/mother | Janjori | | Nyoligu | |
|---------------------------|-----------|------------|-----------|------------|
| | Freq | % | Freq | % |
| 1 | 15 | 18.8 | 13 | 16.3 |
| 2 | 22 | 27.5 | 18 | 22.5 |
| 3 | 22 | 27.5 | 23 | 28.8 |
| 4 | 12 | 15 | 12 | 15 |
| 5 | 7 | 8.8 | 6 | 7.5 |
| 7 | 1 | 1.3 | 6 | 7.5 |
| 9 | 0 | 0 | 2 | 2.5 |
| Total | 80 | 100 | 80 | 100 |

| | Janjori | | Nyoligu | |
|--|----------------|------------|----------------|------------|
| Occupation of Mothers | Freq | % | Freq | % |
| Apprentice | 1 | 1.3 | 5 | 6.3 |
| Dress maker | 0 | 0 | 1 | 1.3 |
| Farmer | 9 | 11.2 | 21 | 26.3 |
| Teacher | 2 | 2.5 | 2 | 2.5 |
| House wife | 41 | 51.3 | 30 | 37.5 |
| Petty Trader | 27 | 33.8 | 21 | 22.5 |
| Total | 80 | 100 | 80 | 100 |
| Educational Background of mothers | Janjori | | Nyoligu | |
| | Freq | % | Freq | % |
| Middle/JSS | 3 | 3.8 | 1 | 1.3 |
| No School | 69 | 86.3 | 71 | 88.8 |
| Primary | 7 | 8.8 | 6 | 7.5 |
| SSS/O'Level | 1 | 1.3 | 0 | 0 |
| Tertiary | 0 | 0 | 2 | 2.5 |
| Total | 80 | 100 | 80 | 100 |

Source: Field data, (2007)

| Marital status of mothers | Janjori | | Nyoligu | |
|---------------------------|-----------|------------|-----------|------------|
| | Freq | % | Freq | % |
| Married | 80 | 100 | 76 | 95 |
| Single | 0 | 0 | 4 | 5 |
| Total | 80 | 100 | 80 | 100 |

| Religious Affiliation of mothers | Janjori | | Nyoligu | |
|----------------------------------|-----------|------------|-----------|------------|
| | Freq | % | Freq | % |
| Christian | 17 | 21.5 | 2 | 2.5 |
| Moslem | 62 | 78.5 | 78 | 97.5 |
| Total | 79 | 100 | 80 | 100 |

Source: Field data, 2007

The modal number of children per mother in both communities was 3 children

Fifty-one percent (51%) and 37% of mothers in Janjori and Nyoligu respectively were housewives

Eighty-six percent of mothers in Janjori and 88.8 in Nyoligu have no formal education and the majority 70% is married. At least 79% are Moslems.

4.2 Cultural factors

Table 4.2 Existence of food taboos in the two communities

| Taboos | Janjori | Percentage | Nyoligu | Percentage |
|--------------|---------|------------|---------|------------|
| Yes | 18 | 22.5 | 5 | 6.2 |
| No | 62 | 77.5 | 75 | 93.8 |
| Total | 80 | 100 | 80 | 100 |

Source: Field data, 2007

In terms of the food taboos, 77.5% mothers in Janjori as compared to 93.8% in Nyoligu said there were no food taboos.



4.3 Socio-economic status

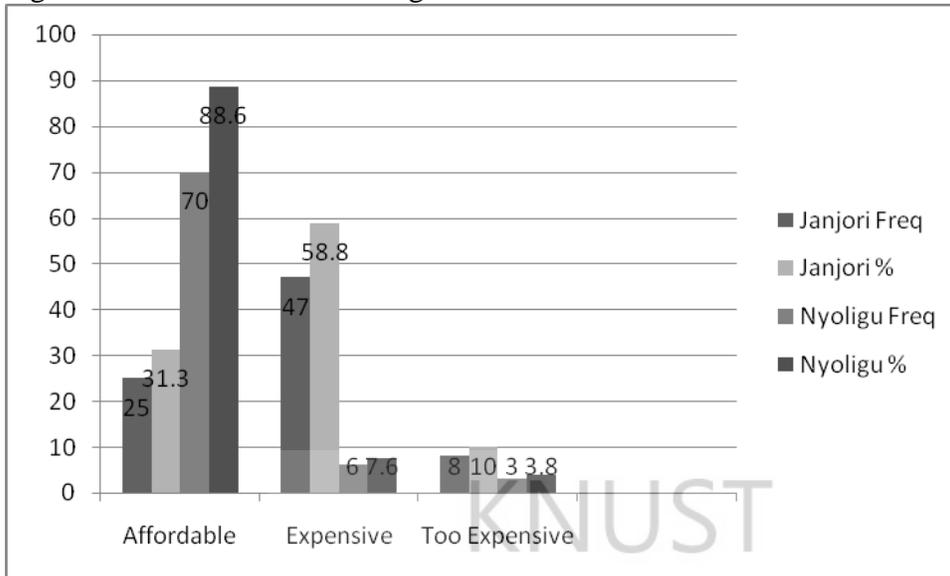
Table 4.3 Cost of feeding a child

| Cost in cedis ¢ | Janjori | | Nyoligu | |
|--------------------|-----------|------------|-----------|------------|
| | Freq | % | Freq | % |
| 2,000 | 2 | 2.6 | 4 | 5.2 |
| 3,000 | 3 | 3.9 | 6 | 7.8 |
| 5,000 | 12 | 15.6 | 27 | 35.1 |
| 7,000 | 0 | 0 | 3 | 3.8 |
| 10,000 | 45 | 58.4 | 33 | 42.9 |
| 12,000 | 10 | 13 | 4 | 5.2 |
| 13,000 | 4 | 5.2 | 2 | 2.6 |
| 14,000 | 2 | 2.6 | 1 | 1.3 |
| 17,000 | 1 | 1.3 | 0 | 0 |
| Total | 80 | 100 | 80 | 100 |

Source: Field data, 2007

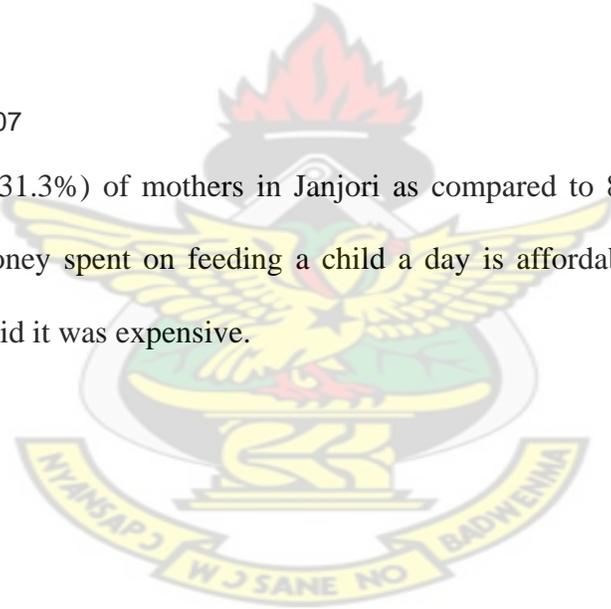
With regard to the cost of feeding a day, 56.3% and 41.3% in both communities spend ¢10,000 while 2.5% and 5% in both communities spend at least ¢2,000

Fig.4.1 Perceived cost of feeding a child



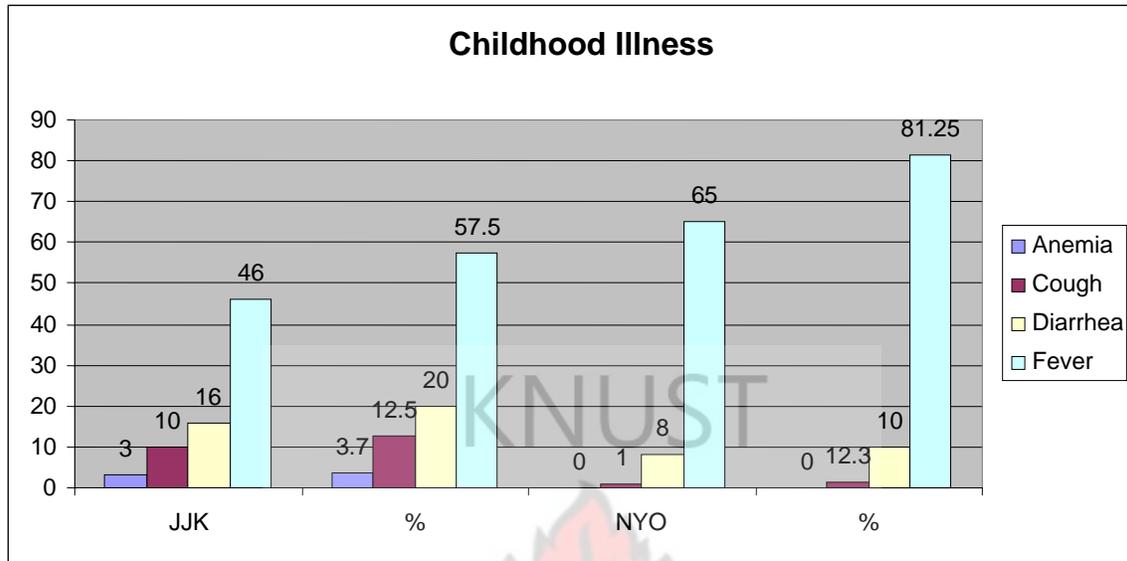
Source: Field data, 2007

Thirty-one percent (31.3%) of mothers in Janjori as compared to 88.6% of mothers in Nyoligu said the money spent on feeding a child a day is affordable. While 58.8% as compared to 7.6% said it was expensive.



4.4 Diseases affecting children

Fig. 4.2: Frequency of childhood illness Janjori and Nyoligu



Source: Field data, 2007

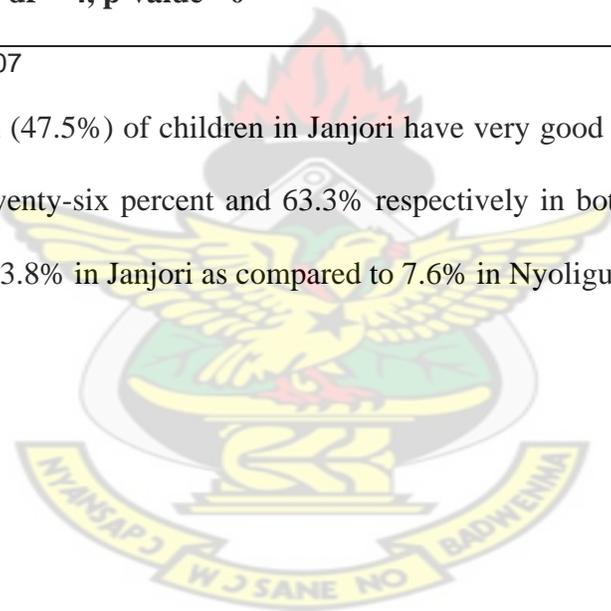
Fifty-seven (57.5%) mothers in Janjori and (81.25%) in Nyoligu mentioned fever, 20% as compared to 10% mothers mentioned diarrhea and 12% as compared to 1.23% in Nyoligu said cough were the frequent causes of ill health among children under-two.

Table 4.3 Appetite of children

| Ratings | Janjori | | Nyoligu | |
|--|-----------|------------|-----------|------------|
| | Freq | % | Freq | % |
| Very Good | 38 | 47.5 | 0 | 0 |
| Fair | 18 | 22.5 | 12 | 15.2 |
| Good | 21 | 26.3 | 50 | 63.3 |
| Poor | 3 | 3.8 | 6 | 7.6 |
| Total | 80 | 100 | 79 | 100 |
| Chi-squared = 29.8, df = 4, p-value = 0 | | | | |

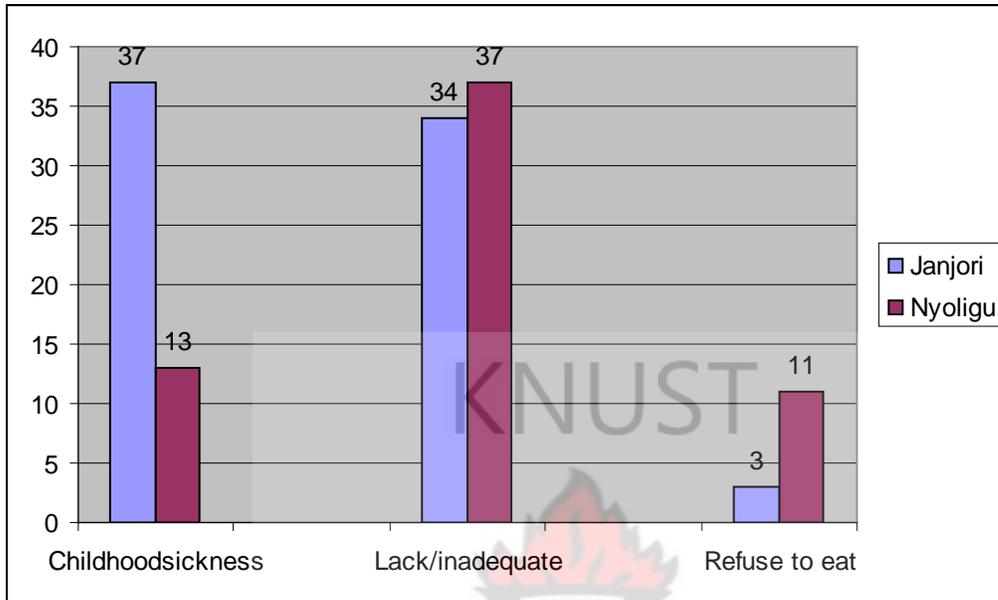
Source: Field data, 2007

Thirty-eight children (47.5%) of children in Janjori have very good appetite for food but none in Nyoligu. Twenty-six percent and 63.3% respectively in both communities have good appetite, while 3.8% in Janjori as compared to 7.6% in Nyoligu have poor appetite.



4.4 Mother's knowledge of child nutrition

Fig. 4.3 Mother's knowledge in causes of undernutrition



Source: Field data, 2007

Thirty-seven (37)46.2% in Janjori and (13)16.2% mothers in Nyoligu attributed the cause of undernutrition to childhood illness. (34)42.5% in Janjori and (37)46.2% in Nyoligu indicated lack or inadequate intake of food. Three (3)3.7% as compared to (11)13.7% said refusal to eat causes malnutrition.

Table 4.4: Choice of complementary food in the two communities

| | Janjori | | Nyoligu | |
|--|-----------|------------|-----------|------------|
| | Freq | % | Freq | % |
| Any food available | 14 | 17.9 | 10 | 13.5 |
| Porridge | 24 | 30.8 | 57 | 77 |
| T.Z | 21 | 26.9 | 2 | 2.7 |
| Wean mix | 19 | 24.4 | 4 | 5.4 |
| Yams | 0 | 0 | 0 | 1.4 |
| Total | 78 | 100 | 74 | 100 |
| Chi-squared = 43.5, df = 5, p-value = 0 | | | | |

Source: Field data, 2007

Nearly a third 30.8% in Janjori as compared to 77% mothers in the Nyoligu chose porridge and 26.9% in Janjori introduced TZ as compared to 2.7% in Nyoligu. In Janjori 24.4% of mothers gave Wean mix as compared to 5.4% mothers in Nyoligu.

Table 4.4 Percentage distribution of health care sourced by both communities

| Source of treatment | Janjori | Percentage | Nyoligu | percentage |
|----------------------------|----------------|-------------------|----------------|-------------------|
| Clinic | 62 | 77.5 | 41 | 51.2 |
| Bought Drugs | 9 | 11.25 | 20 | 25 |
| Traditionalist | 9 | 11.25 | 19 | 23.8 |
| Total | 80 | 100 | 80 | 100 |

Source: Field data, 2007

In the distribution of health care sourced by mothers, 77.5% in Janjori as compared to 51.2% in Nyoligu sought health care at clinics, 11.2% as compared to 23.8% went to traditionalists and 11.2% as compared to 25% bought drugs for their sick child

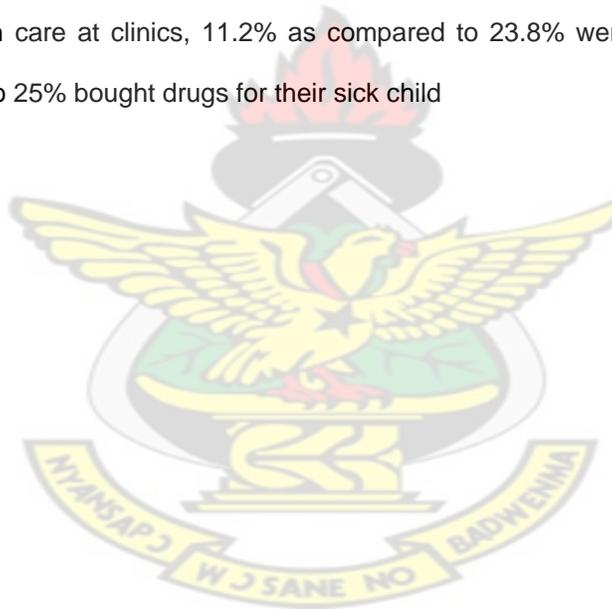


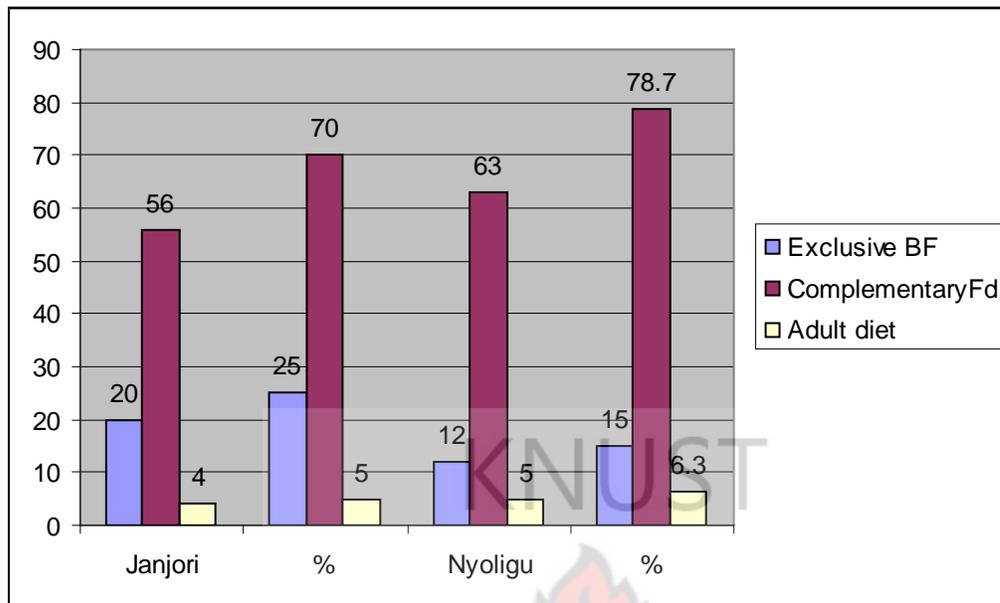
Table 4.5**Age at start of complementary feeding**

| Age in Weeks | Janjori | | Nyoligu | |
|--------------|-----------|------------|-----------|------------|
| | Freq | % | Freq | % |
| 4 | 0 | 0 | 2 | 2.5 |
| 8 | 0 | 0 | 2 | 2.5 |
| 12 | 3 | 3.8 | 20 | 25 |
| 15 | 0 | 0 | 10 | 12.3 |
| 20 | 3 | 3.8 | 6 | 7.5 |
| 24 | 32 | 40 | 26 | 32.5 |
| 28 | 8 | 10 | 4 | 5.1 |
| 32 | 5 | 6.3 | 2 | 2.5 |
| 40 | 5 | 6.3 | 0 | 0 |
| 42 | 4 | 5.1 | 1 | 1.3 |
| 52 | 20 | 25 | 7 | 8.8 |
| Total | 80 | 100 | 80 | 100 |

Source: Field data, 2007

More than a third (40%) of respondents in Janjori and 32.5% in Nyoligu started complimentary feeding at 24 weeks. Twenty-five percent (25%) in Janjori as compared to 8.8% in Nyoligu started at 52 weeks, while 2.5% respondents in Nyoligu however gave complimentary feeding as early as at 4 weeks.

Fig.4.4 Feeding practices of mothers in the two communities

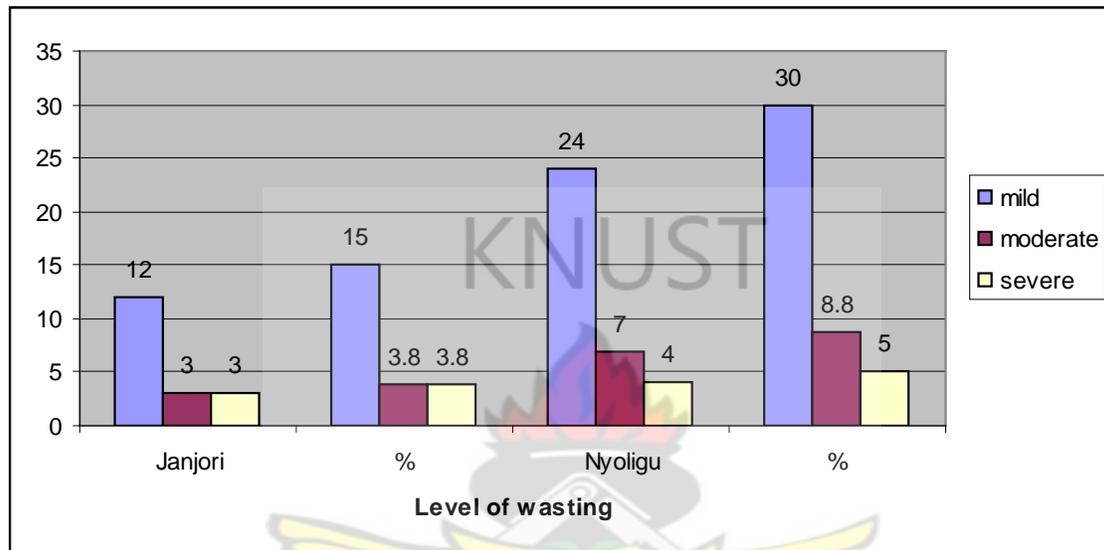


Source: Field data, 2007

With the feeding practices of mothers, 25% in Janjori as compared to 15% in Nyoligu were exclusively breast feeding, 70% in Janjori and 78.7% in Nyoligu were given complimentary feeds, and 5% in Janjori, 6.3% in Nyoligu were given adult diet.(food that the family eats.)

4.5 Nutritional status of children

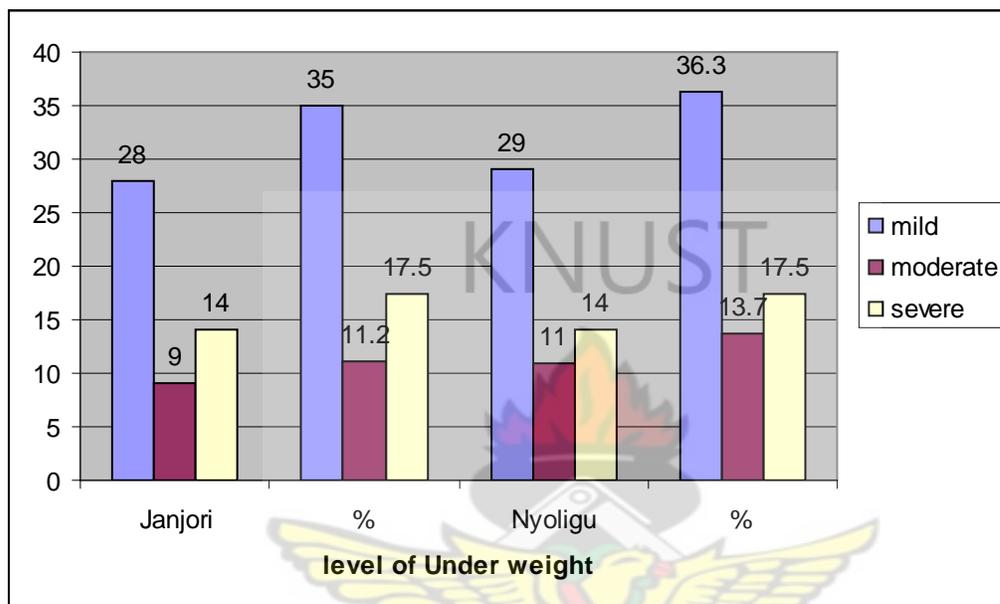
Fig. 4.5 Difference in percentage of wasting in the two communities



Source: Field data, 2007

Fifteen percent 15% of children in Janjori as compared to 30% in Nyoligu were mildly wasted, 3.8% as compared to 8.8% were moderately wasted and 3.8% and 5% were severely wasted.

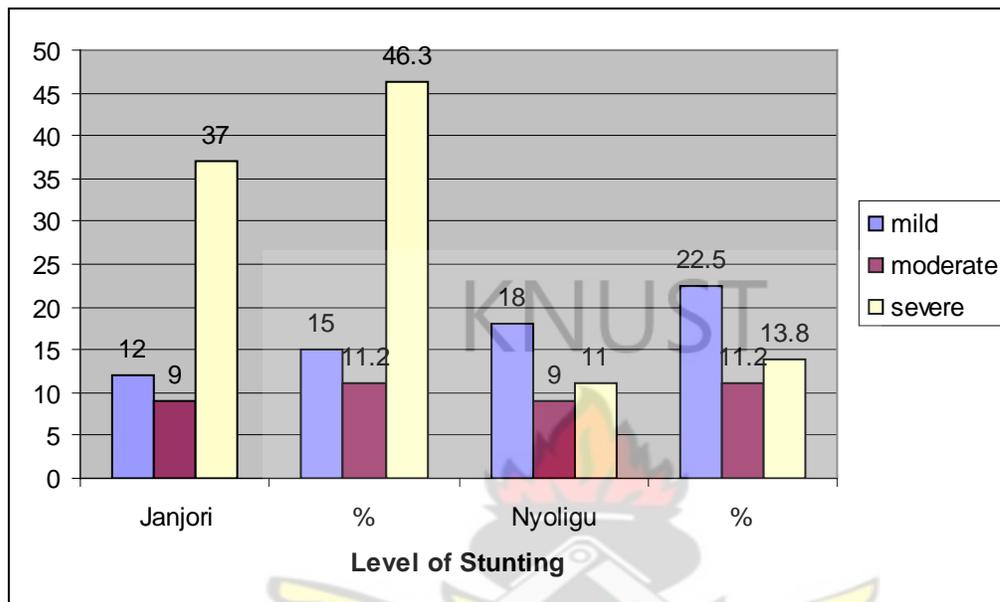
Fig 4.6 Differences in underweight between two communities



Source: Field data, 2007

Among the children underweight, 35% in Janjori as compared to 36.3% in Nyoligu were mildly underweight, while 11.2% as to 13.7% were moderately underweight and 17.5% in both communities were severely underweight.

Fig.4.7 Difference in stunting between the two communities



Source: Field data, 2007

The population of mild stunting in Janjori is 15% as compared to 22.5%, in Nyoligu while 46.3% as compared to 13.8% were severely stunted in Janjori and Nyoligu respectively.

CHAPTER FIVE

DISCUSSION

This chapter looks at the various findings that have been established from the two communities. The findings are on differences and similarities related to nutritional status of children under-two in the study communities as compared to what is available in the literature.

The modal number of children per mother in both communities was 3 children

Fifty-one percent (51%) and 37% of mothers in Janjori and Nyoligu respectively were housewives

Eighty-six percent of mothers in Janjori and 88.8 in Nyoligu have no formal education and majority 70% is married. At least 79% are Moslems

5.1 Cultural taboos related to complimentary foods

The majority of respondents, (77.5%) in Janjori and (93.8%) in Nyoligu said there were no taboos while the rest, 22.5% as compared to 6.3% mothers responded 'yes' there was and that children should not be given eggs, meat and fish because they will grow to become thieves. There was no difference in terms of food taboos affecting children's feeding. The notion of children becoming thieves when given eggs, meat and fish has been a major problem and the health personnel especially field workers thought it is a thing of the past. The problem in this study is why the intervention community; Janjori had more respondents saying 'yes' than Nyoligu, for they have had more contacts with health personal on feeding and at food demonstration centers. The findings are contrary to that found by Linkages that suggested that there has been tremendous behaviour change of people in the three Northern Regions against traditional and cultural practices that militated against appropriate complementary feeding. Food taboos have often been

blamed for under nutrition and yet there is no community without taboos. The main problem is not the taboo but both the accessibility and ability to buy the food. However, it is gratifying that the largest proportion said there were no taboos with regards to complementary feeding. Probably health talks on child feeding at the welfare clinics are adhered to.

5.2 Socio-economic status of mothers

The study revealed that 86% in the intervention community and 88.8% in the control community have no formal education. This result is higher than the national literacy rate of 49.9% (GSS, 2000) Ignorance and lack of education affects knowledge of women in the understanding and preparation of adequate nutrition.

The majority (56.3%) of mothers had 3 children each which are proportional to the National fertility rate of 4.5 (GSS, 2000) however, 6.3% had 7 or more children.

From the study, majority of mothers (51.3%) in Janjori and (37.5%) in Nyoligu were housewives. Housewives do not earn an income and are burdened with care of children. This finding confirms the study by Lipton and De kadt (1988) that the level of income is by far the greatest single cause of variability in food intake. These communities are rural and housewives in this sense mean they really did not do anything economically, but rather depend on their husbands. Even if they did the proceeds will go to their husbands.

The majority of fathers (80%) in Janjori and (66%) in Nyoligu were farmers. It is therefore surprising that these men who farm the food we eat rather have their children malnourished. This confirms the findings of Linkages 2004, in the northern regions that the level of income is by far the greatest single variability in food intake although income is not the only measure of

poverty and many other social and environmental factors contribute to malnutrition are closely linked to the poverty levels of individuals and countries.

With regards to the cost of feeding a day, 56.3% and 41.3% mothers in the respective communities spent ₦10,000 in a day. While 2.5% and 5% in the communities spent at least ₦2,000. On affordability, 31% in Janjori as compared to 88% mothers in Nyoligu said the money spent on feeding a child a day was affordable. While 59% as compared to 7.5% said it was expensive, this could be attributed to the fact that the Janjori communities do not buy food to feed their children as Nyoligu do and therefore see the amount spent as expensive.

5.3 Incidence of ill health in children

Fifty-eight percent (58%) of mothers in Janjori and 81% in Nyoligu said fever was the most frequent cause of ill health in their children. Malaria and other infections present symptoms such as fever. Malaria being endemic in these communities could be the reason why mothers in both communities mentioned fever as the main ailment in their children. Twenty percent (20%) of children in Janjori as compared to 10% in Nyoligu had had episodes of diarrhea two weeks preceding this survey. The intervention community had more number of children who had diarrhea. Common infection like diarrhea last longer and are more severe in malnourished children. The study affirms Morley's assertion that undernourished children often come from poor families, with crowded houses and poor hygiene, and are exposed to more infections. Most children get episodes of diarrhea in the first 2 years of life especially if their food is contaminated.

Thirty (47.5%) of children in Janjori have very good appetite for food but (0%) in Nyoligu. Twenty-five percent (25%) and 63% in the communities had good appetite, 3.8% in Janjori as

compared to 7.5% in Nyoligu had poor appetite. Poor appetite is one of the most important blocks to eating enough food. This could be due to infections, teething and sores in the mouth. It is however encouraging that majority (26%) in Janjori and (63%) of the children in Nyoligu have good appetites. This confirms the assertion; that a child who does not eat enough to cover his nutrient needs is under nourished. Under nourished children develop growth failure and may become malnourished (Stanfield, 1999)

As cited by Ali et al (2006), several studies on infant and young child feeding practices in northern communities (Armar-Klemesu, 1995, Linkages, 2000, and GSCP, 2006) have showed that mothers in most communities acknowledge that children develop poor appetite during illness. 'Light foods' such as '*light Koko* (fermented maize porridge), soft Tuo-zaafi (TZ) and light soup are usually fed to children in small quantities and at frequent intervals.

Usually during sickness such as malaria, measles and diarrhea the child loses appetite. Therefore, inadequate food intake due to loss of appetite and poor absorption of the food eaten are the reasons why children who fall sick often do not grow well. King Savage and Burgess Ann (1993) noted that, children who have frequent illness may not have time to regain the weight loss with one illness before the next illness reduces their appetite, again children who are under nourished may have illnesses that are severe and delay in recovery causing malnutrition. The WHO expressed concern about the vast numbers of infants and young children who are still inappropriately fed and whose nutritional status, growth and development; health and survival are thereby compromised. As much as 55% of infants who die from diarrhoeal diseases and acute respiratory infections may be the result of inappropriate feeding practices.

5.4.1 Difference in Mothers' knowledge in nutrition

The knowledge level of mothers from the two communities was assessed on causes, type of complimentary feeds and feeding practices.

With regards to age of introduction of complementary feeds, mothers in the intervention (Janjori) community introduced complementary foods at 12 weeks and the routine community (Nyoligu) did at 4 weeks. Chi-Squared=0.2, df = 1, p-value 0.6. It is evident that there was no significant difference in knowledge levels of mothers in Janjori and Nyoligu as to when to start complementary feeding. Even though there is a nutrition centre and a mother's support club at the intervention community, mothers did not adopt the internationally accepted age of 6months exclusive breast feeding before the child could eat solid diet. After six months if enriched weaning foods are not introduced sufficiently then breast milk can minimally sustain the children and under nutrition would manifest at the child's weaning period.

As to the causes of under nutrition, 46% in Janjori as compared to 16% mothers in Nyoligu attributed the cause of under nutrition to childhood illnesses. However 34% in Janjori and 46% in Nyoligu mentioned lack or inadequate intake of food as the cause of under nutrition. This good knowledge of causes of under nutrition by mothers in both communities could be attributed to the Child Welfare Clinic (CWC) services offered including nutrition counseling by Community Health Nurses in these communities. This result confirms a comparative assessment of a nutritional education in India which showed that counseling of mothers on feeding practices showed improved feeding practices even in areas where females are discriminated against (Ghosh, 2002).

Most mothers 86.3% and 88.8 in both communities have no basic education and few of them 8.8% and 7.5% had primary education and only 2.5% in Nyoligu had tertiary education. Education is vital to mothers particularly on nutrition. Ignorance and lack of education affects knowledge of women in the understanding of what a balanced diet is. Therefore they may have the food available but may not know the right mix and servings for a child.

With the feeding practices of children 25% in Janjori as compared to 15% mothers in Nyoligu were exclusively breast feeding, 63% in Janjori and 79% in Nyoligu were giving complimentary feeds (koko without added protein); 5% in Janjori and 6.3% in Nyoligu were giving adult diet. This practice of giving plain porridge leads to malnutrition in these communities.

As to how mothers sought for treatment when child was sick, most respondents, 77.5% respectively and 51% sought treatment at health clinics while 11% as compared to 29% went to traditionalists and 11% as compared to 25% bought drugs for their children. More than fifty percent of children in each community 57.5% in Janjori and 81.2% in Nyoligu had diarrhea, while 12.5% and 12.3% had cough as frequent cause of ill health.

The intervention in Janjori cannot be said to have made any difference as far as childhood illness and health seeking behaviors' are concern.

Source of treatment depends on the severity of the condition, money, nearness to the source and the belief system of the family.

5.4.2 Comparing Complementary feeding practices in the two communities

With regards to choice of complementary feeds, 31% as compared to 77% mothers in Nyoligu gave porridge; 27% as compared to 2.7% introduced soft TZ while 25% as compared to 5%

mothers gave wean mix. The study shows that the chosen complementary foods are all corn meal. Corn-based food accounts for almost 90% of the food consumed by the children. The finding was similar to that found in Volta, Eastern and the three northern regions of Ghana where corn meal was the main foods introduced to children (Tagoe-Darko, 2003). This finding however opposes Sanjey's study in Nepal where women prepared super flour – a mixture of roasted cereal grains and pulses as complementary food instead of plain porridge.

These mothers in both communities rarely added protein to the porridge. This could be detrimental to the child's growth as it is well established that protein at that stage in life is very critical in the development of the child. It is evident to relate this trend of inadequate complementary feeding in both communities to the incidence of stunting.

As to the frequency of feeding a child in a day the majority 95% and 85% in both communities fed at anytime the child was hungry. The frequency of feeding children was not different in the two communities. This confirms a study carried out by Linkages (2004) that established no firm rules to the frequency of feeding children on complementary foods in Northern Ghana. Mothers are often of the opinion that a child should be fed as many times as the child wants.

WHO and renowned researchers have expressed concern about the vast numbers of infants and young children who are still inappropriately fed and whose nutritional status, growth and development, health and survival are thereby compromised (WHO, 2000).

5.5 Difference in Nutritional status of children (6-23 months) in Janjori and Nyoligu

Anthropometric measurements provide one of the most important indicators of a child's nutritional status. For each of the anthropometric indices, weight-for-age(W/A), weight-for-

height(W/H), and height-for-age (H/A) comparisons are expressed in terms of the number of children falling into various standard deviation categories from the international reference population median.

With regards to wasting, (W/A) 15% as compared to 30% were mild, (-1SD) 3 as to 8.8% were moderate (-2SD) and 3.8% and 5% were severely (-3SD) wasted. Therefore a total of 23% children in the intervention community, (Janjori) as compared to 44% in the control community, (Nyoligu) were wasted. There was a statistically significant difference between the two communities (p-value $p=0.05$). The hypothesis of no difference in wasting of children in the two communities therefore has been rejected.

Sixty-four percent (64%) children in Janjori and 68% in Nyoligu were underweight (W/H). There was no statistically significant difference as far as underweight was concerned in the two communities. (Chi square= 1.3; df=1; p-value=0.3) The null hypothesis of no difference in underweight children in the two communities therefore cannot be rejected.

For children who were stunted (H/A), 73% were from Janjori as compared to 48% in Nyoligu. Again there was no statistically significant difference between the incidence of stunting in the two communities (Chi square =1.9; df= 1; p-value=0.02)

The fact that Janjori the intervention community had more stunted children than Nyoligu the routine community means the food supplementation was not helpful.

In all 26% were wasted, 65.6% were under weight and 60% were stunted. The proportions are however different from those found by Ali et al (2006) in a study in Northern Region we found 35.5%, 6.6% and 48.8.respoectively. In a survey on nutritional status carried out in the Philippines, Johnson et al, (1998) about 9 out of every 100 children (9.2%) are the least

moderately underweight, while about 5 for every 100 preschoolers (5.4%) are stunted and 7 out of 100 preschool (7.2%) were wasted.

There was no statistical difference with respect to nutritional status of children in the intervention community (Janjori) and the control community (Nyoligu). The null hypothesis of no difference between the two communities cannot be rejected (Chi square 0.0005; df=1; p-value=0.9)

The study showed that the food supplement has not made any impact as far as the nutritional status of children in Janjori is concerned.

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CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

These results show that, in spite of improved food supplement from WFP, the nutrition of children in the intervention area continues to be affected and has not shown any improvement. Feeding practices that are in conflict with traditional beliefs must be changed in favour of modern feeding towards the health of the children. Harmful taboos are adversely affecting children's nutritional status.

The study shows that socio –economically the ignorance of mothers about good nutrition is affecting the prevalence of infection and under nutrition.

The null hypothesis that there is no significant difference in childhood illness in both communities cannot be rejected (p-value is 0.05). The level of childhood illness is very high 61% and 88% in both communities and they all mentioned fever (malaria) as disease affecting children. The Ministry of Health has put in place many strategies to control malaria and its complications. The roll back malaria programme-chemoprophylaxis, alternative preventive treatment and treatment of malaria are included in this package.

The (Chi square 0.2; df=1; p-value=0.6) difference in relation to introduction of complementary feeds in both communities, does not suggest there is a food supplementation in the intervention community. In fact both communities did not meet the recommendation of WHO on the initiation of complementary feeding at 6 months since all of them introduced foods at the age of 4 and 12 weeks respectively.

Porridge is the predominant complementary food in the communities, 31% and 77% mothers rarely add protein to it. There should be an increase in complementary food which is well

nourishing for children above 6 months of age. It would be advisable to teach mothers on how to prepare nutritious weaning mixes from the various ingredients of their farm output and add vegetables and fruit in whatever amount these are available.

In a district with a high prevalence of undernutrition (26% wasted, 65% under weight and 60% stunted), it is very important to educate mothers to take appropriate measures to prevent its occurrence. This will require strengthening the package of preventive education in the targeted nutrition programme. The areas which need to be stressed are exclusive breastfeeding for six months and appropriate (both in quantity and quality) and timely introduction of complementary feeding.



6.2: RECOMMENDATIONS

District Assembly

- The District Assembly should empower women by giving them micro credit that will make them engage in economic activities to earn income to feed their children better.
- District Administration should provide safe water and good sanitation to prevent communicable diseases in the communities that affect the children.
- Assembly representatives should talk to mothers in their communities about the importance of nutrition and report on nutritional status of children in their electoral areas.

District Health Administration

- The District Focal Person for Health education and promotion should intensify health education activities on good nutrition and demystify food taboos that affect children adversely. Food demonstrations, using locally produced ingredients at community durbars and at child welfare clinics should be instituted for mothers to learn. This will reduce malnutrition and make children healthy.
- The District Health Management Team (DHMT) should also increase nutritional surveillance so that undernutrition would be identified early for intervention to prevent complication and improve the health status of children and the health of the nation in general.
- All Nurse Prescribers in the district should be trained in Intermittent Management of Childhood Illness (IMCI) approach to improve child health and reduce the incidence of undernutrition caused by repeated infections.

- There should be channels for nutrition education of mothers and community at all contact points through Child Welfare and feeding Centers, and the use of mass media to educate the community on;
 1. Exclusive Breastfeeding for 6 months and to avoid early supplements.
 2. Introduction of nutritious foods (high caloric, micronutrient and protein).
 3. Protecting children from infections, by measures such as immunization against common childhood diseases.

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Health partners

- WFP and UNICEF should adopt additional strategy in food ration in the district, example; meeting mothers' in their own homes with rationed foods.
- Mothers' should be helped with micro credit to either farm or do petty trading, this will empower them sufficiently enough to take proper care of their children.

Opinion Leaders in Janjori and Nyoligu

- Community members and its opinion leaders should organize community durbars and discuss the effects of malnutrition and its prevention.
- There should also be peer education on adequate nutrition, feeding practices and disabuse the minds of people on food taboos that affect their lives.
- Opinion leaders should encourage mothers to exclusively breastfeed for six months before introducing complementary foods.

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Data Collection Tool for a Comparative Study on Nutritional Status of

Children 6-24 months in the Savelugu/Nanton District.

Mother-child pair Questionnaire

You are rest assured that any information will be held in confidence.

Please tick () Yes /No or explain where necessary.

Thank you in advance.

Background Information

1. Child identity Number.....
2. Date of birth/age (month).....
3. Birth weight.....
4. Birthplace.....
5. Age of mother
 - a. <20)
 - b. 20-29
 - c. 30-39
 - d. 40 and above
6. How many children do have?
 - a. 1
 - b. 2
 - c. 3

- d. 4
- e. 5 and above

7. Mother's occupation

- a. Petty trader
- b. Apprentice
- c. Teacher
- d. Civil servant
- e. House wife
- f. Others (specify)

8. Father's occupation

- a. Farmer
- b. Apprentice
- c. Teacher
- d. Civil servant
- e. Others (specify)

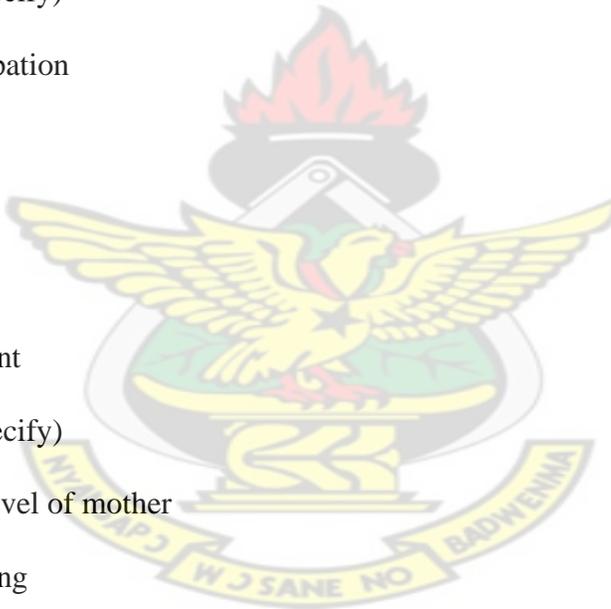
9. Educational level of mother

- a. No schooling
- b. Primary
- c. Middle/JSS
- d. SSS/O'Level
- e. Tertiary

10. Marital status of mother

- a. Married

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b. Divorced

c. Single

d. Separated

11. Religious Affiliation

a. Moslem

b. Christian

c. Traditionalist

d. No religious affiliation

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Nutritional status of the child

12. How is your child's appetite?

a. Good

b. Fair

c. Poor

d. Very good

13. What type of weaning food do you give to your child?

a. Porridge

b. Wean mix

c. T.Z.

d. Any food available

14. What was the weight of your child when you last weighed.

a. Below 5kg



- b. 5-8kg
- c. 9-12kg
- d. Above 12kg
- e. Others

Cultural factors affecting child nutrition

15. What are some of the foods that children are allowed to eat in your house- hold?

- a. Porridge
- b. T.Z, rice,
- c. Eggs, meat, fish,
- d. Yam, potatoes
- e. All foods

16. Which are the foods that children are not allowed to eat?

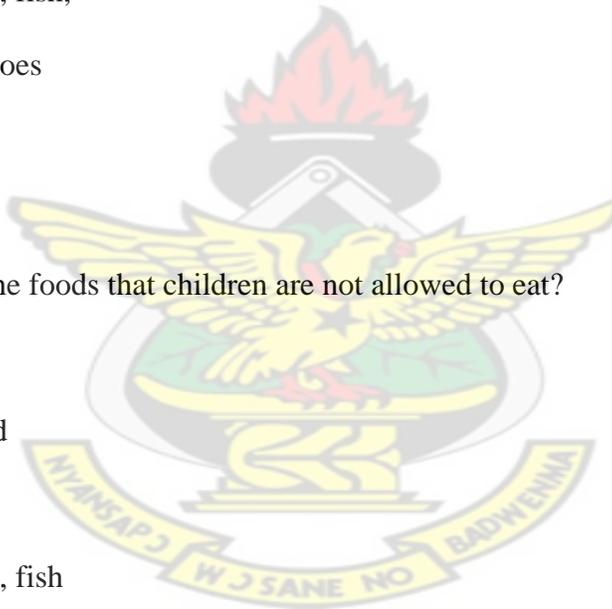
- a. Ice kenkey
- b. Mixed food
- c. Yam,
- d. Eggs, meat, fish

17. State why children are not allowed to eat those types of foods.

18. Do you have any other taboos with regards to foods

Yes () No ()

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19. If yes state them.....

Socio-economic status of mother

20. How many times does your child eat in a day?

- a. Once a day
- b. Twice a day
- c. Three times a day
- d. Any time the child is hungry

21. Where do you get food for the child?

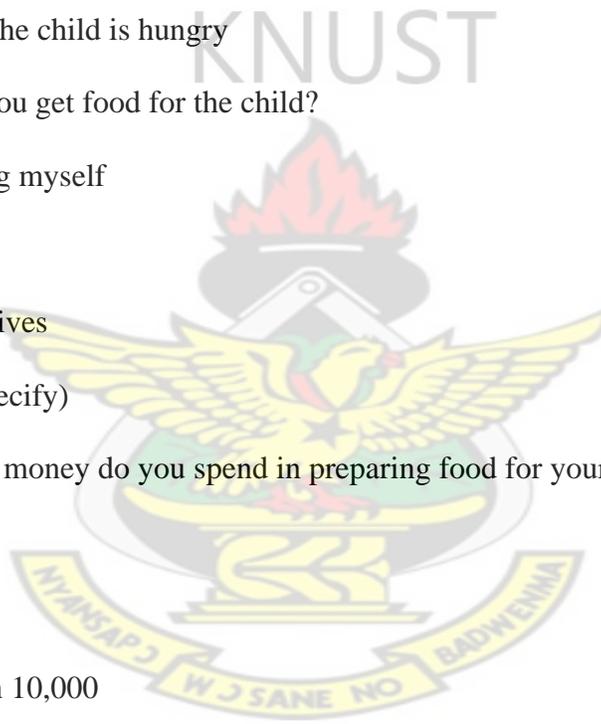
- a. By cooking myself
- b. By buying
- c. From relatives
- d. Others (specify)

22. How much money do you spend in preparing food for your child?

- a. 10,000
- b. 5,000
- c. More than 10,000
- d. Do not spend money

23. How do you perceive the cost of preparing the food?

- a. Affordable
- b. Cheap
- c. High
- d. Too expensive



24. Who provides money or food to be prepared?

- a. Myself
- b. My husband
- c. Husband's relatives
- d. My relatives

Mother's knowledge in child nutrition

25. What causes malnutrition?

- a. Lack/inadequate food
- b. Childhood sickness
- c. Refusing to eat
- d. Lack of time to feed child
- e. Others (specify)

26. When did you start giving your complementary food?

- a. 4wks-12wks
- b. 13wks-23wks
- c. 24wks-52wks(1year)
- d. Above 1year

27. What type of food did you start with?

- a. Porridge
- b. Baby

- c. TZ
- d. Others (specify)

Disease condition of the child

28. How often does your child fall sick/

- a. Once in a week
- b. Twice in a week
- c. Never fallen sick
- d. Once in a month

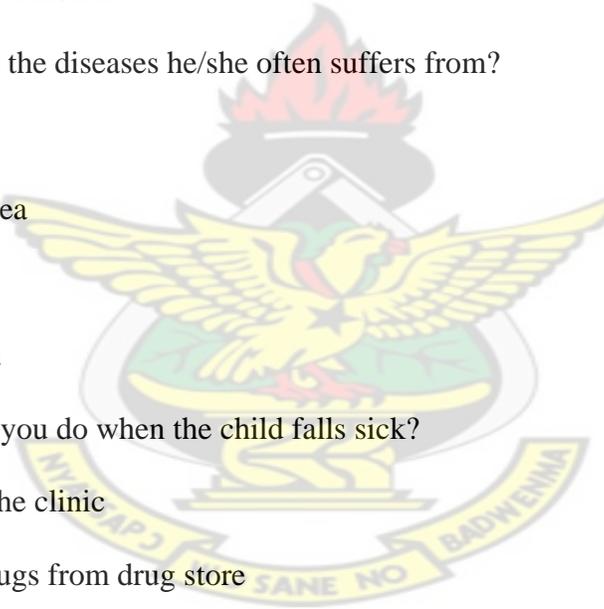
29. What are the diseases he/she often suffers from?

- a. Fever
- b. Diarrhoea
- c. Cough
- d. Anemia

30. What do you do when the child falls sick?

- a. Go to the clinic
- b. Buy drugs from drug store
- c. Consult traditionalist

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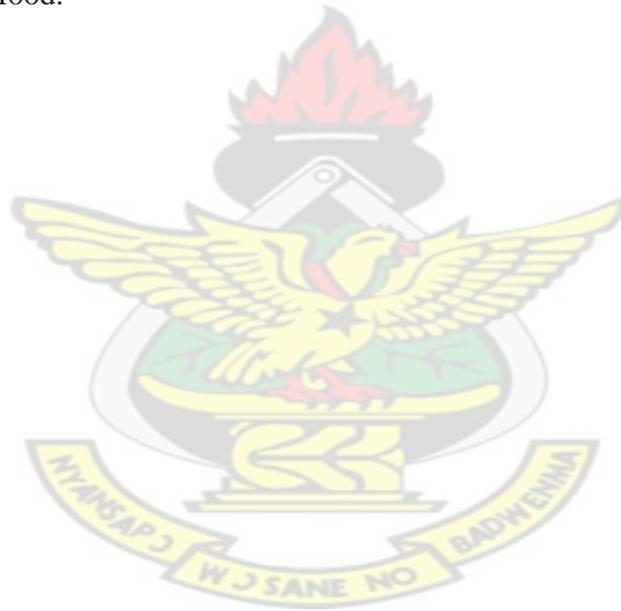
| AGE | SEX | WEIGHT | HEIGHT | OEDEMA | MUAC | FEEDING PRACTICE |
|-----|-----|--------|--------|--------|------|------------------|
| 31 | 32 | 33 | 34 | 35 | 36 | 37 |

NOTE:

1; Exclusive Breastfeeding

2; Mixed feeding (complementary)

3; Exclusive Adult food.



REPORTS ON NATIONAL IMMUNIZATION DAY (NID) AT EAST GONJA DISTRICT 5TH -7TH MARCH, 2010

A regional monitory team left Tamale on 5/3/2010 at 5am and arrived in Salaga on at 7am same day. The District Health Management Team was present and received the regional team. The regional team was welcome by the District Director of Health Service and the regional monitory team leader explained our mission. The coordinator briefed us on preparations done before the start of the exercise that morning.

TRAINING

Training for district supervisors were done on the 2/3/10. All the sub districts did volunteer training on 3rd and 4th respectively. This involved giving of the vaccine, recognition of VVM, marking of houses and little finger and tallying of children immunized.

TRANSPORT

The 3 sub districts had a pick up each for monitory the exercise. The volunteers and staff had either motor bikes or bicycles. There was enough fuel for the vehicles.

LOGISTICS

The district and sub districts had all logistics needed for the exercise. Vaccines, chalk, indelible ink, tally sheets and fuel. Payment of teams was done on the last day of the exercise.

SOCIAL MOBILIZATION

All the subdistricts had Public Address System (PAS) for announcements. Some of the villages also used gongong. Volunteers moved from house to house to make announcements. Announcements were also made in mosques and churches

COMMUNITY VISITS

The regional visited Kafaba, Kakoshe and Lamsa .These areas were adequately prepared with all logistics on hand. However, in Kafaba volunteers finished early to make time for the Damba festival but few vaccinators were still on the field in the surrounding villages. The vaccinators had enough vaccines and other logistics except one team we gave 2 vials of polio and one indelible ink. All houses visited were closed. Rapid assessments were done. Children less than 5 were given the polio vaccine, little fingers on the left were marked with indelible ink and houses were closed. We got back to Salaga at 7pm and briefed the coordinator on findings of our assessments. One child was missed and we vaccinated her.

On day two, 6/3/10 the team visited Kpandi district.

We made a brief stop at Kumdi, one of the subdistricts under Kpandi. The sub district had run out of gas for the refrigerators but was supplied with vaccine and cold packs from kpandi as early as possible each morning before the start of exercise.

We got to Kpandi at about 8am and met with the district team. The coordinator briefed us on the activities on their plan. Micro plan included social mobilization, logistics and transport.

Training of supervisors were done on 27/2/10 and volunteers trained on 3/2/10

Announcements in churches and mosques were made, and house to house information by volunteers. They had three freezers; 2 for ice packs and one for vaccines. The coordinator anticipated shortage of vaccines by the end of the day and had called on Tamale for more vaccines.

COMMUNITY VISITS

We moved to Kitare, a sub district at the river bank. The volunteers had crossed to the other side to work. Rapid assessment was done in Kitare town, Biladja and katigele. In Kpandi township mothers claim they were not previously informed before the exercise. Most houses were marked inside instead of outside walls. In all 89 children less than 5years were assessed. At about 6pm we briefed the district coordinator and the public health nurse on our assessments and left for Salaga.

On day three, we did rapid assessment in Kpembe and Salaga Township (Dagomba line). We met the District coordinator and made briefings on our assessments. Later in the day we moved to Kpalbe, another sub district in East Gonja. Rapid assessments were done at Kpalbe Township and Fuu. No anomaly was detected. Children's little fingers were marked with indelible ink, houses were marked V1 and circled but mothers' were not told when the second phase of the exercise will take place. Final briefing was done through the phone.

Attached are completed assessments forms

TEAM MEMBERS

LUKAYA ALHASSAN – TEAM LEADER

MAHAMA SALIA -DRIVER

