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**A COMPARATIVE STUDY OF NUTRITIONAL STATUS OF ORPHANS
PARTICIPATING AND NOT PARTICIPATING IN SCHOOL FEEDING
PROGRAMMES IN KARIOBANGI, KENYA**

BY

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APPLIED HUMAN SCIENCES OF KENYATTA UNIVERSITY**

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*A comparative study of
nutritional status of*

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DECLARATION


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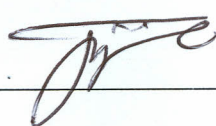
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DEDICATION

This thesis is dedicated to my daughters Lynn and Laura.

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I am indebted to several people without whom this study would not have been accomplished; Dr. Kuria and Prof. Judith Kimiywe who gave their necessary guidance and supervision during this study.

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LIST OF ABBREVIATION

SFP	School feeding programmes
WFP	World food programme
RDA	Required Daily Allowance
FAO	Food and Agriculture Organization
NCHS	National Centre for Health Statistics
UNICEF	United Nations International Children's Emergency Fund
UNAIDS	United Nations Programme on HIV/AIDS
SSA	Sub-Saharan Africa
WHO	World Health Organisation
NGO	Non-Governmental Organizations
HIV	Human Immune Virus
AIDS	Acquired Immune Deficiency Syndrome
NFSC	National Feeding School Council of Kenya
SPSS	Statistical Package of Social Sciences

ABSTRACT

The Millennium Development Goals highlights Malnutrition as one of the priority development issues under its framework of which malnutrition remains an important public health concern in the developing world especially Kenya (MDGs, 2008). Nutritional status and nutritional food security are a priority as malnutrition is a risk factor for morbidity and mortality, poor cognitive development and reduced productivity (Black, Allen, Bhutta, et al., 2008; Grantham-McGregor, Cheung, Cueto, et al., 2007). The aim of the study was to compare the nutritional status of orphans participating in a school feeding programme and that of orphans not participating in such a programme. The study was a cross-sectional comparative survey carried out in Kariobangi location, Korogocho slum. The population under investigation comprised of 7 schools in Kariobangi location, 3 of which were in the school feeding programme and 4 of which were not. A sample size of 160 orphans aged between 5 to 10 years was determined. Sampling techniques were a combination of purposive sampling and simple random sampling techniques. The research instrument was a questionnaire and an interview schedule. Data was analysed using SPSS, nutrisurvey and anthro plus computer packages. The dependent variable was nutritional status measured by indexes, height for age, BMI for age, and underweight. The findings of the study revealed that school feeding programme had a higher proportion of malnourished children (underweight 20.3%, low Body mass Index for age 16.5% and stunting 19.2%) than the non school feeding programme (underweight 5%, Low Body Mass Index for age 10%, and stunting 20%) although only the low BMI for age was significantly different for the two groups at $P < 0.05$. Calorific intake was inadequate in many of the orphans in both groups but more orphans in the non school feeding group were meeting the recommended dietary allowances for most nutrients compared to those in the school feeding group. Majority of school feeding programme group (61.4%) consumed foods of medium dietary diversity score while majority of non-school feeding programme (61%) consumed foods of high dietary diversity score.(significant at $P < 0.05$).The levels of morbidity in terms of cold/cough and fever were significantly higher in non-school feeding programme compared to the school feeding programme. Multiple logistic regression analysis showed that orphans who stayed for a short time without their mothers were less likely to be underweight in the school feeding programme (OR: 0.78 CI 0.64- 0.94 $P = 0.013$) and stunted in the non- school feeding programme (OR=0.72 CI 0.59-0.58 $P = 0.00$) than those who had stayed for a long time. In terms of low body mass index for age, orphans in the school feeding programme who consumed diets of few food groups were significantly thinner compared to those who had consumed foods of many food groups.(OR= 2.15 CI 1.04-61.32 $p = 0.046$). The study recommended diversification of food within the schools offering feeding programmes through urban farming of vegetables and poultry within the school compound. The Ministry of Education and partners like WFP and others NGOs with interest in school going children need to enlarge the scope of school feeding programme in Kariobangi. It is also necessary to carry out a longitudinal study on the impact of school feeding programmes on orphans.

CHAPTER ONE: INTRODUCTION

1.1 Background to the study

The Millennium Development Goals highlights malnutrition as one of the priority development issues under its framework of which malnutrition remains an important public health concern in the developing world (MDGs, 2008). Nutritional status and nutritional food security are a priority as malnutrition is a risk factor for morbidity and mortality, poor cognitive development and reduced productivity (Black, Allen, Bhutta, et al., 2008; Grantham-McGregor, Cheung, Cueto, et al., 2007).

UNICEF (2012) defines an orphan as a child who has lost one or both parents. The orphans are at risk of malnutrition compared to non orphans. There is an increasing number of orphans in the world (UNAIDS 2004). UNICEF, (2012) estimates that there are approximately 210 million orphans worldwide. These children have either lost their parents to HIV and AIDS, wars or natural disasters among other causes.

According to SOS Children's Villages (2012) there are currently an estimated 53.1 million orphans in Sub-Saharan Africa while in Kenya Childinfo (2011) estimates that there are 2.6 million children who have lost one or both parents due to all causes. Meanwhile Lindblade, Odhiambo, Rosen and Decock (2003) states that the impact of orphan hood on the health and nutrition of children is likely to be the greatest on young children including those going to school. This is because young children are dependent on adults to provide them with food, shelter, education and care.

Although orphans are more vulnerable than non-orphans, those from low-income areas and poor resource settings are likely to be more disadvantaged with serious nutritional deficiencies as a result of food insecurity (World Food Programme (WFP),

2008a). Consumption of meals through school feeding programmes (SFP), especially in poor regions may help increase the total dietary intake of school going orphans. SFP also contributes to better nutrition and address specific micronutrient deficiencies (McGregor, Powell, Walker and Himes, 2005).

According to the International Federation of the Red Cross and Red Crescent Societies (2013); discrimination and stigma, emotional need and grief over illness or death of parent(s), increase of poverty, loss of property and inheritance rights, loss of shelter, inadequate health care, vulnerability to physical and sexual abuse or being in youth headed households (YHH), child headed households (CHH) or engaging in child labor increases the vulnerability of orphans to nutritional insecurity.

Urban malnutrition is an increasing problem (Fotso, 2007), with 72% of sub-Saharan Africa's urban residents living in informal settlements characterised by poor environmental and health conditions, limited livelihood opportunities, and a higher prevalence of other health hazards including poor environmental sanitation and HIV/AIDS (Nairobi: APHRC; 2002). Kenya is a low-income, food-deficit country. The country has been ranked by the Food and Agricultural Organization (FAO) as amongst the 10 most food insecure countries in the world (WFP, 2008). Endemic poverty, low economic growth, environmental degradation and high population growth conspire to create problems for household food security, while recurrent floods and droughts tip the fragile balance and send households living on the borderline into food insecurity and desperate need.

Kariobangi is an area characterized with people with low economic status which holds Korogocho slum the third largest in Kenya; it is also well known with its high levels of poverty and food insecurity. In Korogocho itself, the dumping site is a source of livelihood for many residents. Cow, fish and chicken intestines from factories find their way into the community as cheap protein. Given that 26% of children die as a result of diarrhea each year in the urban slums, food safety is a major force affecting health care (EHP, 2004).

In a study by Wakoli, Etyyang and Lakati, (2012) "Undernutrition of orphans and vulnerable children: a comparison of cash transfer beneficiaries and non beneficiaries in Korogocho slums, Nairobi" findings, among the beneficiaries shared that prevalence of wasting was 6%, underweight 6% and stunting 32.7% and nutrient inadequacies were high in vitamin A, folate and zinc in both beneficiaries and non-beneficiaries.

World Food Programme (2007) supports many school feeding programmes all over the world. The programmes' objectives are to impact educational attainment by increasing enrollment, attendance, cognition, and educational achievement, although the scale of benefit and the evidence of effect vary by program type. SFP ensure that children from poor backgrounds get a meal on each school day.

The basic WFP food commodities for school feeding: cereals: maize (whole or meal), wheat flour, bulgar wheat, sorghum or rice pulses: beans, lentils or peas canned fish or meat vegetable oil sugar fortified blended foods (BF) such as corn soy blend (CSB) fortified biscuits (WFP, 2007). Consumption of these meals may help meet the specific nutrient needs of the children (McGregor *et al.*, 2006). In particular, SFP are

very useful to orphans in the slums where malnutrition is likely to be a problem as a result of limited dietary intake (Mwangi *et al.*, 2007).

Orphans are also faced with greater health and nutritional risks than children who have parents to care for them (UNAIDS 2004). With the increase in the number of orphans in Kenya, especially due to HIV and AIDS, it is important to have specific nutritional information on orphans so as to put in place necessary policies and interventions that will safeguard them from nutritional risks.

In Kenya, some of the studies that have been done include: Ngome (2002) carried out a study on the impact of the school feeding programme on the school participation rates of primary pupils in Kajiado district. The study revealed that the nutritional status of pupils in SFP schools is relatively better than that of pupils in the non-SFP schools. Meme *et al.*, (1998) found that children participating in the NFSCCK programme in Nyambene District were better off in terms of nutritional status and school performance than children not participating in the programme.

Another study by Mwaniki (2011) revealed that malnutrition was prevalent among HIV/AIDS orphans and therefore appropriate strategies should be applied or formulated to alleviate the sufferings of this disadvantaged group. However, the studies reviewed did not focus on the effect of school feeding programmes on nutritional status of orphans in urban low income areas. It is in light of this background the study embarked to fill the existing knowledge gap with special reference to Kariobangi slum.

1.2 Statement of the Problem

Most orphaned children have limited access to food mainly because one or both of their parents have died (UNAIDS and UNICEF, 2009). This, coupled with discrimination and stigma, emotional need and grief over illness or death of parent(s), increase of poverty, loss of property and inheritance rights, loss of shelter, inadequate health care, vulnerability to physical and sexual abuse or being in youth headed households (YHH), child headed households (CHH) or engaging in child labor increases the vulnerability of orphans. Orphans who are malnourished are also more susceptible to disease (UNAIDS and UNICEF, 2009). Such orphans' conditions are aggravated by the fact that they live in resource poor settings characterized by lack of access to adequate medical attention.

One objective of School Feeding Programme is to improve the nutritional status of school going children (WFP, 2004/2008). It is therefore expected that there should be an empirical difference between the nutritional status of school children engaged in School Feeding Programme and those not engaged. As noted earlier, orphans are particularly at risk of malnutrition as compared to non-orphans. The purpose of this study therefore, was to determine if there is a difference in nutritional status between these two groups of orphans in the low income Kariobangi area which is characterized by high levels of poverty and food insecurity.

1.3 Purpose of the Study

The purpose of the study was to compare the nutritional status of orphans aged 5-10 years participating and not participating in a school feeding programme in Kariobangi.

Study Objectives:

- i) To determine the demographic and socioeconomic characteristics of the households of the two study groups in Kariobangi.
- ii) To determine the nutritional status of orphaned children in the two groups in Kariobangi.
- iii) To determine the morbidity status of orphaned children participating and those not participating in school feeding programme in Kariobangi.
- iv) To determine the dietary intake of orphaned children participating and those not participating in school feeding programme in Kariobangi.
- v) To determine the factors that influence nutritional status of orphans in the two groups of orphans in Kariobangi.

1.5 Hypothesis

The study tested the following hypothesis;

H_0 : There is no significant difference in nutritional status of orphans participating in SFP and those not participating in SFP.

1.6 Significance of the Study

The findings of this study will be beneficial to The Ministry of Education and Non-Governmental Organizations (NGO), United Nations bodies dealing with Food Security and Nutrition such as (FAO) World Food Programme (WFP) and World Health Organization (WHO) and other development partners in the formulation and implementation of effective intervention policies and strategies targeting food security of orphaned children.

These findings will also contribute to the on-going research efforts on the role of the school feeding programme in improving the nutritional status of school children and orphans, who are an important segment of the Kenyan populace.

1.7 Delimitation

This study was carried out among orphaned children in school feeding programs in Kariobangi slum area. Results can only be generalized to a population that has similar characteristics and in similar situations.

1.8 Study limitation

The 24 hour recall method was used to determine the dietary consumption. The one day recall is a short period and did not reflect an individual's usual food consumption pattern. It relied on the subject ability to recall the food and drinks consumed. This could have been strengthened by conducting multiple 24 hour recall which was not done.

Another limitation was that there were other different school feeding programmes but the study only concentrated on schools under WFP- school feeding programmes.

1.9 Conceptual Framework

The conceptual framework underlying this study was as shown in figure 1.1. The determinants of orphan's nutritional status are not interlinked , morbidity, dietary intake and factors affecting nutritional status(independent) while the Comparative of orphans participating and non participating in school feeding programmes (dependent variable). Dietary intake and morbidity status are the immediate determinants of an orphan nutritional status that manifest themselves at the level of the individual human being.

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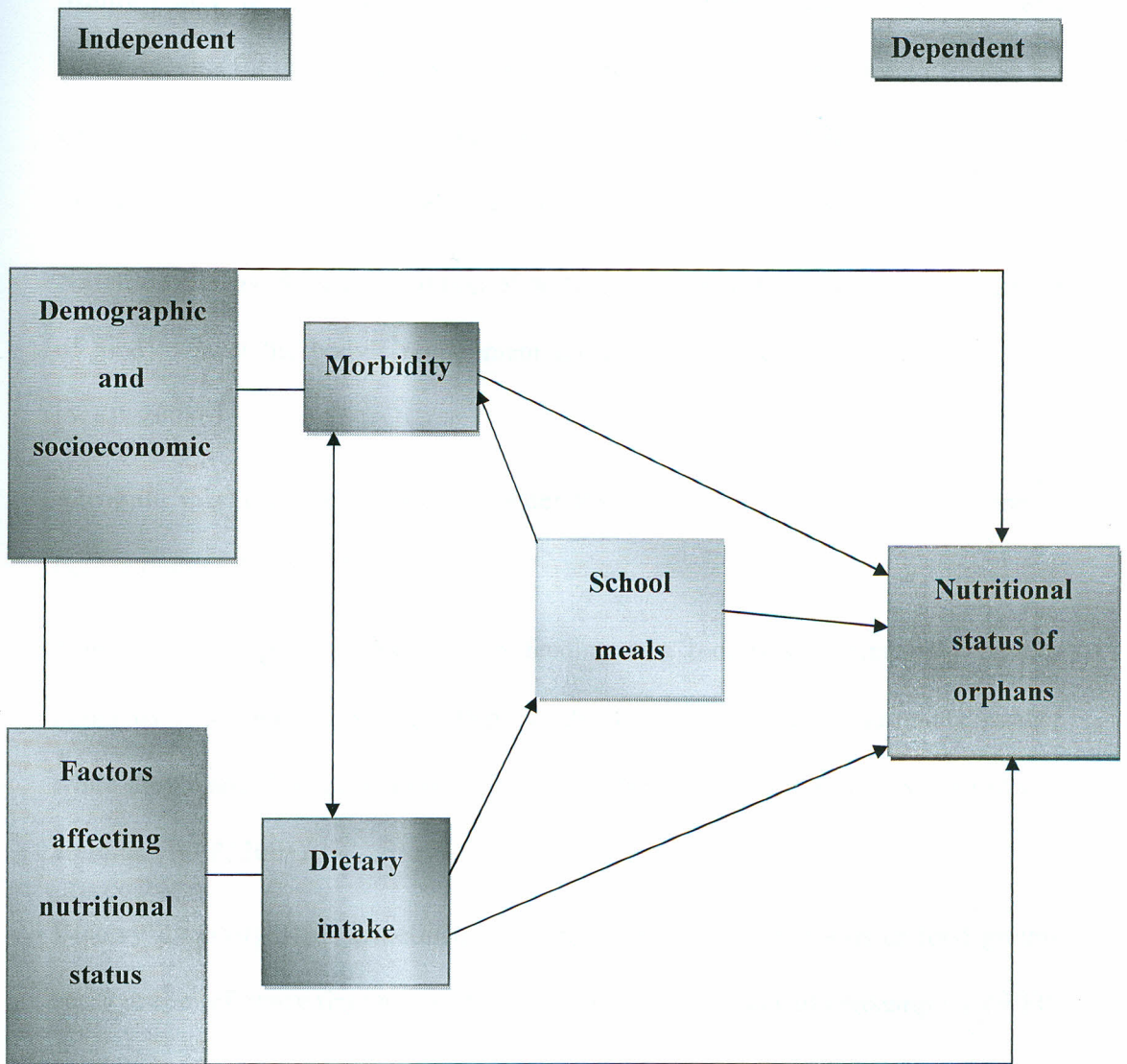


Figure 1.1: Conceptual framework

Source (modified from UNICEF 'Nutritional status', 2008)

1.10 Operational Definitions of Terms

Energy/Nutrient Adequacy: the level of intake of energy or essential nutrient in relation to the energy/nutrient requirement for adequate health, which is expressed as percentage of recommended energy and nutrient intake (NSCB, 2008)

Malnutrition: In this study, it is described as the condition manifested by adverse measurements for the incidences of BMI for age, stunting and underweight. These are evidenced by the ratios BMI for age, height-for-age and weight-for-age respectively. This is as follows: < -1 is normal, < -2 is moderate and < -3 is severe (WHO, 2006)

Nutrition Status: State or condition of body in relation to food intake and utilization of food to meet the body's requirement for growth, maintenance and reproduction (WFP, 2008b)

Orphan: this is defined as a child, under the age of 18 years, who has lost one or both parents (UNICEF, 2012).

School feeding programme: School feeding is a tool which effectively enables hundreds of millions of poor children worldwide to attend school and reduce hunger while they learn. This programme ensures that free school meals are given to school children (WFP, 2004).

Dietary diversity: This is defined as the number of different foods or food groups eaten over a reference time period, not regarding the frequency of consumption (WFP, 2007 3ff).

CHAPTER TWO: LITERATURE REVIEW

2.1 Theoretical framework and conceptualization

School feeding programmes in low-income countries are generally aimed at achieving the Millennium Development Goals and Education For All goals, framed within education sector strategies and plans. In food insecure contexts, household choices regarding education are often a result of complex decision processes where poverty and hunger play an important role in determining schooling outcomes (World Bank, 2006). In building a programme theory for school feeding from the educational perspective, an initial outcome that drives increased school participation is the incentive to households to send children to school.

Generally, this incentive is achieved through an income transfer offsetting the financial and opportunity costs of schooling and through an enhancement of the services provided at school. School feeding may also have an incentive effect on pupils actually wanting to go to school to receive food rather than staying at home and missing out. In theory, both of these effects will contribute to shift short-term household decisions towards increased schooling.

The specific effect of the incentive will very much depend on the context in which school feeding is operating. Conceptually, the health and nutrition improvements from school feeding actually reinforce the impact on education. Addressing micronutrient deficiencies, in particular iron and iodine, has been shown to have a positive impact on learning, as has the systematic deworming of school-age children in areas of high prevalence of intestinal helminths (Jukes et al., 2008). Extending the school feeding programme theory to cover explicitly other nutritional benefits is an important area of

ongoing work (Adelman et al., 2008). The income transfer incentive and the improved health and nutrition status resulting from school feeding service provision would then lead to improved access and learning outcomes. From the educational perspective, these outcomes would then lead to the long term goals of school feeding programmes as captured by the Millennium Development Goals and Education For All Goals.

2.2 Concept of nutritional status of orphans

Food is believed to be an essential requirement for any functioning, the process of growth and development (ILO, 2008). This is especially true in the critical stages of young orphans. There is an accumulating evidence showing that the factors that might help in creating malnutrition in orphans are numerous and complex. Socio-economic status is one of the major factors that deeply influence the nutritional status of orphans. The conceptual framework for this study shows that the demographic and socio-economic status has strong effects on the child's nutritional status, especially in the developing countries, mainly in urban areas. Gibson and Mace, (2006) explained how the increase in family size raises the percentage of malnutrition. They identified that the percentage of children with poor nutritional status obviously increased in families with three or more children.

Rizkallah (2005) determined the economic status and the possibility for concerning the adequate food that is needed for improving infant's nutritional status. She explained how family income can be one of the most important determinants of nutritional status of children that deeply affect the food quality and preparation. She reported that malnutrition is increased with the increasing poverty. Mother's or care

givers knowledge, awareness and feeding practices have direct effect on orphan's nutritional status that might place the child at risk (UNICEF Press Release 2009).

2.3 Demographic and Social economic factors

2.3.1 Demographic factors

Candace Miller (2007) in her study on "Children Affected by AIDS: A Review of the Literature on Orphaned and Vulnerable Children" cited Caldwell (1997) and Madhavan (2004) who stated that in Sub-Sahara Africa (SSA), children frequently reside with numerous family members throughout their lifetime to ease the burden on single parents, for children to go to school, and for domestic or agricultural labor. Indeed this tradition is a vital coping mechanism in nations with growing orphan populations. The statement was coined in by citing Monasch & Boerma (2004) who reported that by the year 2000, 7%-37% of households with children contained orphans throughout SSA.

Ainsworth & Filmer (2002), Case et al., 2004 and Monasch & Boerma (2004) cited by Miller (2007) noted that the literature on the characteristics of care giving households is primarily based on three cross-national comparison studies that use DHS and MICS surveys. Each of these analyses use data from 1992-2002 so do not necessarily reflect the current situation, nor do they focus on any one country. Also, countries with the highest rates of HIV and orphanhood (Swaziland and Lesotho) are not included. Finally, while these studies identify regional trends, household surveys were not designed to capture complex fostering patterns, the dissolution of households, and OVC mobility, all of which occurs in a dynamic epidemic.

Other studies provide data on orphan households but contribute limited demographic insights because they use non-representative samples. Nevertheless, the analysis of 10 SSA nations mostly in Eastern Africa, revealed that nearly half of 6-14 year old maternal and paternal orphans lived with surviving parents, followed by grandparents (Rusakaniko, Chingoco, Mahati *et al.*, 2006).

In addition, 86% of double orphans aged 6-14 lived with grandparents, other relatives, and adopted caregivers, while 9% lived with siblings and 4% lived with non-relatives. Likewise, Monasch and Boerma (2004) find similar results in their analysis of 13 SSA nations: Of youth not living with surviving parents, 90% of double and single orphans lived with extended family. The majority of orphans lived with grandparents in Namibia (62%) and Zimbabwe (63%). Grandparent-headed households became more common in Tanzania, Zimbabwe and Namibia, where 44% of children lived with grandparents in 1992 compared to 62% in 2000, perhaps indicating that other relatives are saturated with caregiving responsibilities. The mean age of the head of orphan households is 49 in West and Southern Africa, compared to the SSA average of 43 in non-orphan households (Monasch & Boerma, 2004).

Orphan households in SSA are more likely to be female-headed than households without orphans. Throughout SSA, 31% of households without orphans and 42% of households with orphans are female-headed (UNICEF, 2005 updates), while in Southern Africa, 55% of households with orphans are female-headed. Children may be more malnourished in female-headed households because women often have fewer years of formal schooling and lower earning potential than men; they frequently work longer hours for less pay, and fulfill caregiving responsibilities for children and older

persons (UNESCO, 2005). Ethnographic research from Northern Uganda found that female-headed households received little support from their own clan (Oleke, Blystad, and Nekdar, 2005). In Zimbabwe, the percentage of orphans living in female-headed households grew from 36% in 1994 to 53% in 1999 (Miller, 2006). However, increases in female-headed households may slow as the growing numbers of women with HIV die (Schultz, Madhavan and Williams, 2011), which in turn, may force children to form their own households or live on the street in the absence of willing caregivers making their nutritional status become poor.

Single and older persons are the primary caregivers for orphans, so it is not surprising that orphans tend to be malnourished. Paternal orphans, in particular, lived in the poorest households in 10 East African nations (World Bank, 2004). Orphans aged 7-14 lived in poorer households than non-orphans in Ghana, Senegal, and South Africa, although the reverse is true in Uganda and Zambia (Case & Ardington, 2005). In Botswana, household surveys revealed that orphan households had fewer assets, poorer housing quality, smaller living spaces, and worse dependency ratios than non-orphan households (Miller, 2006).

In many countries, orphans are living in households where the head has low levels of achieved education, which impacts employment opportunities, earned income, and caregiving behaviors. In Botswana, Kenya, and Tanzania, orphans were more likely than non-orphans to live in households where the head had no education (Miller, 2005). In Zimbabwe, 36% of orphans lived with households where the head had no education, compared to 14% of non-orphans (Case & Ardington, 2005). In addition, the dependency ratio is less favorable in orphan than non-orphan households

throughout SSA so that orphan households struggle to meet economic and caregiving responsibilities (Miller, Gruskin, et. al. 2006).

UNICEF *et. al.*, (2005) stated that there have not been consistent patterns in the distribution of orphans by urban and rural residence. A higher percentage of orphans lived in urban areas in 14 countries, such as Malawi and Uganda, while a higher percentage of orphans lived in rural areas in Kenya and Namibia. The location of a households impacts access to public services like medical which influences the nutritional status of orphans, employment options, and orphans protection mechanisms, yet insight into these situations is extremely limited.

The researcher recognizes studies undertaken on the comparative analysis of orphans objectively; most of these studies have concentrated on orphans with HIV or left by parents who have died through HIV but they have not considered to seek information from school feeding orphans taking into account the most populated slums like Korogocho which stands to be the third largest slum in Kenya. The researcher therefore took this step to undertake the study to create more literature for future scholars with related studies.

2.3.2 Social economic factors

Reduction in household income and the large expenditure for medical care arising from the death or morbidity of prime age adults puts significant financial strain on households. Household income shock may reduce orphan's schooling because of food constraints. In addition, illness or death of parents may change their orphan's time allocation: the demand for their time to engage in income-earning activities and to care for an ill person may increase substantially, leading to poor care practices that

may affect their nutritional status. Furthermore, orphans may suffer emotional trauma of seeing parental death or develop psychological problems, such as depression, anger, and fear, for their future (UNAIDS 2004).

Traditionally, mutual cooperation systems, such as fostering children by kinship, extended family, and communities, have functioned well as a risk-coping mechanism in Sub-Saharan Africa increasing chances of improving nutrition. Extend families (in particular, grandparents) have had a great responsibility as orphans' caregivers and, in fact, most orphans have been cared for by them (Williamson, Foster, and Levine 2005)

Many households struggle with a heavy burden of fostering ever more orphans (Heymann et al. 2007). Households that take in orphans may face severe nutrition constraints. For instance, in southern Africa, more than 20 percent of households with children are caring for one or more orphans (UNICEF 2010). Under these circumstances, households may invest less in human capital of children, especially of fostered children. It may well be the case that disparities in human capital investment exist between fostered orphans and biological children. If intra-household discrimination against orphans exists, even though the returns to schooling are not different between orphans and non-orphans, a policy intervention to redress the inequality in human capital investment could be effective.

This study seek to know more in relation to sources of food consumed by both school feeding orphans and non-school feeding orphans, meanwhile having a knowledge that most slum dwellers have no permanent employment making their source of income to cater for their food become hard to achieve.

2.4 Assessment of Nutritional status of children in school feeding programmes

Orphans constitute one of important segment of our population. Growth and development of the children is largely dependent on their nutritional status. Survana in her study “nutritional status, level of intelligence and participation in extracurricular activities of school children” (2007) cited Khadar (1997) who indicated that the nutritional status of children is assessed by various methods viz., Anthropometry, Biochemical, Clinical, and Dietary Intake. Nutritional status assessed by anthropometric measurements indicates physical growth of a child. Among the various anthropometric measurements height and weight either single or in combination are used to assess the physique.

Other commonly used anthropometric measurements include circumference of chest, head, mid arm, foot length sitting height, limb length, biceps and candy or breadth of the femur and limb circumference. Height and weight are the best to determine the growth pattern of a subject in a larger group. Anthropometry is simple and reliable method for assessing the growth status progress of normal children. It helps to identify the abnormalities at the sub clinical level. Hence anthropometry is considered as one of the important tools for assessment of malnutrition.

In a study by Kim A. Lindblade, Frank Odhiambo, Daniel H. Rosen and Kevin M. DeCock (2003) on “health and nutritional status of orphans <6 years old cared for by relatives in western Kenya” they found that there was no significant difference between orphans and non-orphans in terms of the mean H/AZ scores Only in W/HZ scores did orphans appear at a disadvantage compared with non-orphans, with W/HZ scores almost 0.3 standard deviations (SD) lower in orphans.

In another study by A. Sadik (2010) on "Orphanage Children in Ghana: Are Their Dietary Needs Met?" it was reported that although the dietary patterns of the orphaned children were not good, the orphans were not malnourished 10% were severely stunted and 15% were severely wasted with cut-off points of (<-2) Z-score. This can be partly linked to the poor planning of menus and purchasing procedures found in the orphanage. The study demonstrated that some of these orphaned children in institutional care had poor growth and development.

Helen, Ami and Steve, (2008) pointed out that age should be taken into account to assess weight for height of school children aged 6-12 years. Further the authors observed that height and weight of boys were higher than girls up to the age of eight and then the trend had changed. They also observed that weight for height increased with age consistently for both sexes.

Ann and Elaine (2008) conducted a study on dietary counseling in the management of moderately malnourished children. The result highlighted that half of the respondents fell in moderately under weight (wasted) and one fifth in moderately stunted group. A greater proportion of boys were under weight wasted and stunted than girls.

Pande et al.(2000) conducted study on health status of school children (n=776) aged 5-16 years of Ludhiana revealed that girls of all ages except the 14 years had lower mean weight for age compared to ICMR standard. The height for age was also less in both boys and girls than the standard. The prevalence of wasting and stunting was high (52.2% and 26.3%) in boys and girls respectively indicating equal suffering. The children between 11-15 years (72.4%) were suffering from some sickness at the time of examination. The problem of anemia was more in girls (30.5%) than boys (22.9%).

Sunita Kumari (2005) conducted a study to assess the nutritional status of school children from Bihar. The findings reported a high incidence of malnutrition as revealed by anthropometry. Increment in height and weight were more in girls than in boys although not much variation in intake of food and nutrients. Oninla et al. (2006) conducted a comparative study of nutritional status among urban and rural Nigerian school children. The result on 366 rural and 383 urban children depicted that mean nutritional indices weight for age, weight for height and height for age were significantly lower in rural than urban children.

The sample which was according to WHO standards included 1500 children (705 males and 795 females) from the five representative areas of the Gaza Strip: cities, villages, refugee camps, Bedouin and peri-urban communities. Results indicated that malnutrition is an existing problem. Of the total sample, 15.1% were low-weight. Wasting was found in significant differences between the two sexes. However, geographical differences showed that South Gaza suffered from more malnutrition than other areas. Among other things, the researcher concludes that there is an essential need for continuous monitoring and surveillance of the children's status.

Hence, many research studies indicated that malnutrition (under weight, wasting and stunting) constituted major health problems among school children. However limited studies have been done on nutritional status of orphans in school feeding programmes and those not in feeding programmes.

2.5 Morbidity status of children

Many orphans are exposed to numerous infections because of lack of adequate support and care. In Korogocho, cow, fish and chicken intestines from factories find their way into the community as cheap protein. It is given that 26% of children die as a result of diarrhea each year in the urban slums, food safety is a major force affecting health care. (EHP 2004).

In research done by M. Were, O. Ohiokpehai, J. Kimiywe, M. Mbagaya *et al.*, on Nutritional status and morbidity among HIV/AIDS-affected children aged 6-9 years in Suba district, Kenya results indicated high morbidity patterns among school children. The common illnesses were malaria (16%), skin infections (8.0%), upper respiratory infections (6.1%), stomach ache and diarrhea (1.9%). Malaria coupled with high fever and anorexia causes a reduction in absorption and utilization of nutrients hence leading to increased body requirements for nutrients, therefore leading to malnutrition. Orphans living in slums are prone to various childhood diseases due to overcrowded households and lack of sufficient and clean water; this basically leads

In a research results it was found that there were no significant differences in key health indicators between orphans and non-orphans. As Kim A. Lindblade *et al.*, (2003) states that the proportions of children with fever, parasitaemia, reported history of any illness, diarrhoea, upper respiratory disease and treatment for any illness in the past 2 weeks did not differ by orphan status, nor did mean Hb values.

While in the development of this research the researcher experienced difficulties in getting materials and literature related to morbidity of school feeding orphans however there seems to be a lot studies but also can't access more information. This

study stood to create more information for future scholars researching on morbidity of school feeding orphans and non-school feeding orphans.

2.6 Dietary intake

2.6.1 Food consumption and dietary intakes of the orphaned children

Macro-and micronutrient intakes: A Combination of dietary deficiencies mostly is the underlying cause of malnutrition, but acute infections maybe a cause. Poverty remains a predominantly urban problem Dercon and Stefan (2009) and therefore making children the most affect population also needs most attention. Various interrelated factors are usually contributory to malnutrition, such as a marginal food supply as a result of urban poverty, income and rising prices, all at the expense of child care.

Sadik (2010) discussed that nutrition education should play a major role when improving diets, but the actual practices, as well as the underlying economic and socio-cultural reasons, must be fully understood before attempts are made to modify feeding practices. Children globally obtain their energy, macro-and micronutrients from a variety of sources. However, identifying these sources and comparing them to age groups, present difficulties, since food are sometimes classified in different ways (Sadik, 2010).

According to MRC (2008) children have very high energy and nutrient needs for normal body growth development and activity. Findings of the nutrient intake in Ghana, showed that mean levels of energy for the groups within the same age, were below the RDA whereas protein intake was higher than the RDA. Intake of fat and carbohydrates was low for all the age groups of, two to eighteen years. Although the children's total protein intake was sufficient, their energy intake was low. The

findings indicated deficiency of iron, vitamin A and iodine constitute a problem of major health concern.

T. Colin Campbell Foundation (2008) indicated that one out of two children had an intake of less than half of the recommendation for energy and a number of nutrients (calcium, iron, zinc, vitamins A, D, C and E); other nutrients were riboflavin, niacin and vitamin B6). Sadik (2010) quoted 2003 Ghana Demographic Health Survey statistics indicating that about 21.4% of pre-school children are anaemic and 33.3% of young children had a marginal vitamin A status. The results of this study showed that a low mean intake of micronutrients prevailed, including iron, zinc, calcium, niacin, riboflavin, thiamin, vitamin A and vitamin C, in all the age groups.

Vitamin D is needed for calcium absorption and for deposition of calcium in the bones. Because this nutrient is available from the action of sunlight on the subcutaneous tissue, the amount required from dietary sources, depends on non-dietary factors, such as geographical location and time spent outside, therefore children in Ghana may probably need no dietary vitamin D, which could be ascribed to adequate sunlight. According to Sadik (2010) Results of the present study indicated, that 85% of the orphanage children were engaged in outdoor games, which is a sign that children may not have a serious problem of micronutrient deficiency.

The inclusion of meat and dairy products, poultry, nuts, liver and green vegetables which are rich sources of vitamin B1, B2, B3 and B12 in the eight-day cycle menu, will increase the intake, although sources of the vitamin B group were among the top 20 frequently consumed food items; the quantities consumed were too small. These results suggested that the children might probably be at risk of vitamin B complex,

Iron Deficiency Anaemia (IDA) and Vitamin A Deficiency (VAD) before the intervention (Ghana Demographic Health Survey, 2003).

A similar result by Dannhauser et al. (2000) showed that pre-school children younger than 72 months of age had a low median intake of micronutrient. This study also indicated that intakes of calcium, magnesium, zinc, ascorbic acid, vitamin D and vitamin C were inadequate and therefore the children might probably be at risk of developing micronutrient deficiency disorders. A possible reason for these low intakes could be that of poor food procurement, lack of a planned menu for the orphanage and inadequate nutrition knowledge of caregivers. Victoria Government Health Information (2010) suggested that poorly planned menus could affect adequate nutritional intake.

Government of the Republic of Malawi and FAO (2009) indicated, insufficient quantity and quality of available food did not necessarily reflect growth failure observed in institutionalized children, but rather too few caregivers to ensure that the available food was fed to those too young to feed themselves, a lack of tactical stimulation and care during the planning of meals for infants, children and adolescents.

Many children in Kenyan slums are orphans where most of their caregivers are unable to provide them with three meals in a day meanwhile they tend to join schools offering lunch. Therefore the study seeks information relating to dietary intake from orphans in a school feeding programme and those not in such a programme.

2.6.2 Dietary diversity scores

Dietary diversity score is defined as the number of food groups consumed during the diet-recording period. The individual dietary diversity scores aims to capture nutrient adequacy. Many studies have shown that an increase in IDDS is related to increased nutrient adequacy of the diet (Fanta, 2006). In other studies, dietary diversity scores have been positively correlated with increased mean micronutrient density adequacy of complimentary foods and micronutrient adequacy of the diet in non breastfeeding children (FAO, 2007).

2.7 Factors influencing nutritional status

2.7.1 Health of the caregiver

Geelea Seaford (June 2012) urged that the health of a caregiver is the most important predictor of orphan health, according to a new Duke University study that spans five less-wealthy nations in Africa and Asia. More important than an orphan's geographic location, living conditions or past trauma, the Duke study finds that an unhealthy caregiver likely means an malnourished child. The findings prompt Duke researchers to call for international orphan policies to place greater attention on assessing and treating an orphan and his caregiver's health together, rather than focusing solely on children's health.

Published in PLoS One today, the study of more than 1,300 randomly selected orphans and abandoned children from six diverse settings found strong and consistent associations between poorer child health and poorer health among their caregivers. (Geelea Seaford, 2012). One in five children was in fair or poor health, with one in four reporting symptoms like fever, cough and/or diarrhea in the previous two weeks.

Forty-five percent of the caregivers in the study reported their own health to be fair or poor, and one out of four also had similar symptoms in the past two weeks (Geelea Seaford, 2012).

He continues to say children in fair or poor health were also more likely to have suffered additional traumatic events beyond losing a parent and to receive fewer than three meals a day. However, children whose caregivers were more involved in their lives and well-being were less likely to be sick or unhealthy. The multi-site study included community-dwelling orphans ages 6-12 and their caregivers from six culturally- and economically-diverse sites across five countries: Cambodia, Ethiopia, India, Kenya and Tanzania. All of the children in the study have survived the death of one parent or were abandoned by both parents.

Of 153 million children orphaned worldwide, 145 million reside in less-wealthy nations where high rates of HIV/AIDS and other diseases like malaria and tuberculosis claim thousands of lives every day (Nathan T., 2012).

“This study produces strong evidence to inform policy and resource allocation relevant to the health of this large vulnerable child population worldwide,” said Nathan Thielman, lead author and associate professor of medicine and global health at the Duke Global Health Institute. “Specifically, policies that promote orphan well-being should include health assessments and interventions that target the caregiver-child dyad.”

Researchers say a lack of economic resources may be a contributor to poor child health. Orphans are often cared for in households headed by females or the elderly; these households may have less money and are less likely to cover medical expenses

associated with caregiver illness, further limiting their ability to provide adequate nutrition and access to health care for the child.

2.7.2 Social-economic support

Orphans and other vulnerable children and their families are confronted with severe threats to their well-being including isolation, loss of income, educational access, shelter, nutrition and other essential necessities. When families and children are forced to focus on daily basic needs to decrease their suffering, attention is diverted from factors that contribute to long-term health and well-being. It is widely recognized that most of the problems faced by AIDS-affected children and households result either directly or indirectly from the economic impact of AIDS.

This study intended to focus its findings on influence of the caregivers'; level of education, type of the caregiver, occupation, income and weekly expenditure on orphans basing the research on the caregivers in urban areas like Korogocho slams.

2.8 Orphans as vulnerable group

If children are described as a group at risk, orphans are the most marginalized subset of this group. Yet the population of orphans continues to increase owing to various factors. These include HIV and AIDS, natural disasters or divorces and separations. Socio-cultural, political and economic factors are also to blame. Orphans are exposed to a whole spectrum of adversities that children with biological parents may be shielded from. Nutrition status is a central concern for this group.

In order to reduce the incidence of global chronic and acute malnutrition, it is vital that planners give special focus to this group. According to the report by Oxford University press (2013), about 43 million children in the sub-Sahara African countries

are orphans. Due to nutritional requirements, most orphans are forced to leave school and engage in hard labor or prostitution. Even some of them are taken in by the orphanages, at times feel the food is not enough for them; they feel lack of protection, care, and love and eventually suffer stigmatization.

2.9 Background of school feeding programme in Kenya

The Government of Kenya and WFP initiated school feeding activities in 1980, and school feeding has remained a core development intervention in the educational sector since that time. At the global WFP level, school feeding continues to occupy priority institutional space, as articulated in Strategy Four of its 2008- 11 Strategic Plan (WFP, 2008-11).

While WFP has traditionally designed school feeding interventions toward the achievement of goals in combating hunger in children, improving nutrition, and increasing educational and learning outcomes, its new School Feeding Policy 2009 also casts school feeding as a key element of safety net programmes that enable households to maintain livelihood asset packages and endure transitory shocks. As a result of this re-orientation (WFP 2009a), WFP has begun to develop concrete indicators of safety net results to incorporate into country programmes (Walingo M. K, and Musamali B., 2008). Kenya has one of the most long- standing and largest school feeding programmes in WFP's portfolio. WFP- assisted school feeding in 2007 reached 1.2 million children in 3600 schools at an estimated cost of 66 million dollars and has consistently been one of WFP's three largest programmes globally since 2002. School feeding began in Kenya in 1979 with a school milk program, 13 but the programme proved too costly and was replaced by the Government - WFP partnership

in 1980. The first WFP- assisted programme targeted 220,000 students at the pre-school and primary school level. In 1999, WFP integrated school feeding into its 5-year Country Programme (CP) cycle (1999- 2003 and 2004-2008). In 2004- 2007, the school feeding coverage under the CP was expanded in response to the widespread drought conditions that required an emergency response.

The additional schools assisted by the ESFP were located in the semi- arid districts. WFP continues to use school meals as a means of timely response to emergency food security crises in targeted locations.

WFP-School school feeding programmes in Kenya

WFP is the largest implementer of school feeding programmes in the world. In 2008, globally, it reached an average of 22 million children in school in around 70 countries. WFP's school meals programme in Kenya is one of the largest and most long-standing (since 1980). From 1999 onwards, responding to increased frequency of food crises resulting from drought and political violence and to the introduction of free compulsory primary education in 2003, the programme in Kenya expanded significantly, peaking at 1.85 million children in over 5,000 schools. In 2008, the Government of Kenya took over responsibility for half the programme, while WFP focused on providing meals in primary schools with the lowest education indicators in the most food insecure part of the country (the ASAL's and urban slums of Nairobi & Mombasa). Government of Kenya commitment to education is high. A new programme of Home-Grown School Feeding and a new policy on School Health and Nutrition herald an integrated, cross-sectional approach, including commitment to providing a 'balanced' meal at school.

2.10 Evaluating school feeding programmes

In light of the political sensitivity of SFPs and the vulnerability of the target population (children), a great deal has been written about SFPs, both negative and positive. The main arguments are as follows: As a result of significant methodological shortcomings, Grantham-McGregor (2005) argues that caution must be expressed with regard to the findings of many of the studies that purport to have found an association between hunger and school performance (Grantham-McGregor, 2005). The World Bank (2006a) has argued that the jury is still out on the effectiveness and sustainability of SFPs, and that there is little evidence that school feeding programmes have a positive impact on nutrition for participating children. There is the added problem of parents in some circumstance providing less food for children in SFPs (the school meal simply replaces a home meal).

School feeding programmes (which are often sold as nutrition programmes) may have benefits in terms of school enrolment, Mark Tomlinson (2007) cites Jamison and Leslie (1990) stating that, particularly for girls, and may help to keep children at school, but they have no impact on the root causes of malnutrition and hunger.

The World Bank (2006b) has argued that one of the main reasons for the relatively weak commitment of many governments to nutrition programmes is that, many governments claim that World Bank are investing in nutrition because of their financing of school feeding programmes. Resources are then not allocated to other nutrition programmes even though there is limited evidence that SFPs work as a nutritional intervention (World Bank, 2006). School feeding is seen as less effective and less strategic in that there are tested technologies which, when implemented at

scale, result in significant reductions in malnutrition and micro-nutrient deficiency (World Bank, 2006)

Perhaps the most common criticism of school feeding programmes has to do with the timing of intervention. The best window of opportunity to address malnutrition and under-nutrition is in the first two years and the pre-school years, where the principal damage occurs. According to the World Bank (2006) school feeding programmes are likely to have little effect on reversing the damage to brain development (caused by early malnutrition and micronutrient deficiency), or on long-term productivity and human capital formation.

Bundy (2005) states that, in countries where food aid can be safely assured for the entire community (antenatally for mothers, and from birth and onwards for children) then the question of whether school children should be targeted for food aid is not an issue. However, where food aid is finite (in most cases) then the appropriate target of food aid should be children under three years of age, to ensure an appropriate developmental trajectory throughout their lives (Bundy, 2005). One of the arguments in favour of nutrition programmes that focus on younger children is the finding that children in poor health start school later in life, and in many cases not at all (Del Rosso, 1999). Buddy (2005) indicates that earlier studies have found the probability of a stunted child attending school as 5%. In addition, malnourished children in Ghana entered school later and completed fewer years of school than better-nourished children (Glewwe and Jacoby, 1994).

Nutrition education, de-worming and iron supplements are widely seen as better school based nutrition interventions than school feeding. In addition, there is good

evidence that iron supplements and de-worming improve schooling outcomes. It has also been argued that school feeding only improves learning when the food is accompanied by other inputs related to teaching quality (World Bank, 2006a).

Bundy (2005) argues that, while there is convincing literature that the enrolment and participation of girls in school can be increased with a school feeding programme, there is also evidence that the same objective can be achieved by a monetary incentive such as a cash transfer.

There is particularly good evidence that an appropriate early morning snack has some educational impact. A hot meal in the middle of the day (or other foodstuffs, as is often the case) has high opportunity costs and there is little or no evidence of any nutritional or educational impact (World Bank, 2006a). The World Bank (2006a) has also argued that most African governments are not in a position to sustain SFPs – the average cost per student in the development SFPs of the WFP in 2000 was \$34 for a 180-day school year. The clearest evidence of the benefit of SFPs is increased school enrolment, particularly of girls (Bundy, 2005).

Cost effectiveness is a complex issue with regard to SFPs. Generally, feeding programmes (including SFP) are the most expensive nutritional interventions. Interestingly, there are no evaluations that assess the cost effectiveness of SFPs, and 12 no analyses that compare SFPs with other targeted food-based interventions (Bennett, 2003). When thinking about cost effectiveness it is useful to consider aspects such as whether food is cooked on site at the school or elsewhere (this is usually cheaper, as it does not involve a kitchen at the school and the necessary equipment). One should also consider whether the food is local or imported.

In the case of school feeding being undertaken by an external agency, food aid in the form of a take-home ration is often seen as being essentially without cost and therefore clearly advantageous (for the national government) over a cash transfer.

However, this does not take into account the long-term sustainability of food aid. More crucially, it does not take into account the effects of external food aid on local food markets and local farmers (who, in many instances, would be the potential beneficiaries of the food aid). This is particularly relevant with regard to issues of food sovereignty and the extent to which SFPs have an adverse effect on the global economy. Subsidies on food products are likely to distort prices in the local economy, which, in turn, may have negative implications for food production (Bundy, 2005) in the very same communities that SFPs are intended to assist.

In light of the fact that the best evidence for the effectiveness of SFPs is increasing levels of school enrolment (Bundy, 2005; Jamison and Leslie, 1990), the World Bank (2006a) recommends that SFPs should target poor areas where enrolment and attendance are lowest and where the value of food is sufficient to attract children to school. They add, however, that the SFP must be integrated into a broader package that includes the promotion of balanced nutrition, clean water and high sanitary standards. These issues should form part of an educational reform programme that must include teacher training, curriculum reform and student assessment (World Bank, 2006a).

In summary, while it is socially desirable that children do not remain hungry or have to walk long distances home to eat, serious questions remain about whether governments in resource-poor settings should be allocating resources to school

feeding, and whether priority should perhaps be given to younger children. To situate the discussion of a possible alternative model, a brief discussion of SFPs in two African countries is in order.

To those unfamiliar with the concept of school feeding, it may seem like a form of nutritional intervention. School feeding has also been used as a short-term intervention to increase the enrolment of girls and the retention of learners in schools. So, evidence for the nutritional benefits of school feeding is mixed, for the following reasons: School feeding is an ideologically sensitive and highly politicised arena, which makes the conducting of robust trials very difficult (Grantham-McGregor, 2005). Poor nutrition and health complaints that contribute to poor school performance are also associated with a variety of socio-economic conditions, which, in turn, impact on school attendance. In times of crisis, controlling for all the possible covariates is almost impossible (Grantham-McGregor, 2005).

A further complicating factor is that many nutritional and growth difficulties have their origins during the first two years of life rather than during primary school years (Bennett, 2003). Tomlinson 2007 in his study "School feeding in east and southern Africa: Improving food sovereignty or photo opportunity?" cited Mendez and Adair (1999) showing that a child's ability to catch up early nutritional deficiency is limited after the age of two. In contrast, Del Rosso and Marek (1996) have argued that school-age children are, in fact, susceptible to a variety of nutritional difficulties, while ABC (2011) on parenting has shown how some catch up (following stunting) is possible between the ages of two and eight. There is also considerable evidence of the

benefits of micronutrient supplementation for the growth of school-age girls and the reduction of later childbirth complications (Bennett, 2003).

While there is little difference between using SFPs as an emergency measure versus using them as a form of developmental intervention, there is some heuristic value in distinguishing them. Many of the same principles that govern school feeding as an emergency measure govern school feeding as a form of developmental intervention. The main difference is that, in aiding recovery, the targeting becomes more refined (Bennett, 2003).

Developmental SFPs have, as their focus, improving the livelihoods of particular groups that are vulnerable to food insecurity, and not simply (for example) improving school enrolment. The argument here is that, if increased enrolment is the aim, then using government funds to reduce or waive school fees would be a more cost-effective way of ensuring this than an SFP (Bennett, 2003). The SFP here might also include take-home rations, with the explicit focus being on income transfer within the community and not solely on school feeding. The focus here is on wider food security within the community and increasing the availability of, and their access to, food.

The principles underlying the use of an SFP as a developmental intervention include the fact that school feeding and take-home rations add to the food baskets of families, and thereby indirectly alleviate the costs of education. In the developmental approach, school feeding is also considered to be an impetus for the community – and possibly the private sector – to become involved in the implementation of SFPs (Bennett, 2003).

CHAPTER THREE: METHODOLOGY

3.1 Research design

This study adopted a cross-sectional survey design that was comparative in nature with analytical components to establish the nutritional status of those orphans participating and those not participating in school-feeding programmes. A survey design was used as it seeks to obtain information that describes the existing phenomena.

3.2 Study of variables

3.2.1 Dependent Variables

Nutritional status, the key dependent variable, was determined as low body mass index (BMI) for age to measure wasting, height for age (HFA) to measure stunting and weight for Age (WFA) for under-weight. The cutoff point for severely malnourished was below -3 SD, moderately malnourished was between -2 and -3 SD and above -1 SD for mild/normal.

3.2.2 Independent Variable

Independent variables are variables which affect the nutritional status of the orphans. These included demographic and social economic, nutritional status, morbidity status, dietary intake and factors that influence nutritional status.

3.3 Location of Study

This study was carried out in Kariobangi location in Nairobi (Map Appendix 3) Kariobangi is a low-income residential estate in northeastern Nairobi, Kenya. It is composed of both apartments and slum-type dwellings. The houses in Kariobangi

Estate are varied in design and range from the flats and massionates, including the famous red brick, timber houses (owned by the Nairobi City Council), to the privately owned bungalows. This area also encompasses Korogocho slums, which is the third largest informal settlement in Kenya, after Kibera and Mathare. Korogocho is divided into nine villages. The area is characterized by very many informal settlements, lack of basic infrastructure, poor access to health services and basic waste-disposal systems (GOK/ KBS, 2008).

As is common with most city council estates, the estate has suffered its share of maintenance neglect coupled with uncoordinated housing extensions and new real estate developments. A number of former open-children play grounds and land reserved for building light industry enterprises to fight poverty in the area, have been grabbed and turned into low cost, permanent and semi-permanent, housing units. The highlight of this unfortunate trend has been the development of an informal settlement estate or 'slum', near the primary schools (GOK/ KBS, 2008).

Kariobangi South Estate is served by one City council maintained school, the Kariobangi South Primary School. Other schools include St Johns Informal School, Kariobangi North, St Daniel Comboni/Korogocho Primary School, St Michael, New Starlight, Valley Bridge and Ngunyumu Primary Schools. Of these, only three are supported by WFP/GoK feeding programmes while the others are not. Those supported by SFP include St. Johns Informal School, Kariobangi North primary school and St Daniel Comboni/Korogocho Primary School.

Therefore the location of this study was Korogocho slums in Kariobangi location. The slum characterized by people with low economic status also is the 3rd largest slum in

Nairobi with high rate of poverty. It has 11 primary schools with orphans of which 8 of them do not participate in school feeding programs while 3 participate.

3.4. Target Population

The target population consisted of all orphans in primary school in Korogocho slums. For purposes of this study, out of the 11 schools only 7 schools were surveyed, four schools were without school feeding programmes and three schools had school feeding programmes. The accessible population consisted of orphans between the ages of 5 to 10 years in schools participating and those not participating in SFP in Korogocho slums. This category of children was selected because at this age children are very physically and mentally active but as orphans, they lack adequate care (UNAIDS, 2008). The orphans participating in SFP and those not participating formed the target population. The SFP had 132 orphans while those not in the SFP were 315.

3.5 Sample Size determination and sampling procedures

3.5.1 Sample size determination

According to Saunders, Lewis and Thornhill (2009), a minimum sample size of 30 subjects in each group is adequate for comparative studies in any population. This was increased to 80 in each group to decrease the margin of error to make the sample more representative. On this basis, the researcher settled on a sample size of 80 for each group. Therefore, a sample of 80 orphans from schools participating in school feeding programme and 80 orphans not participating in school feeding programme was used giving a total sample size of 160.

3.5.2 Sampling technique and procedures

Purposive sampling technique was used to develop the sampling frames. Three schools were selected since they were in SFP and 4 were selected from the 8 schools without SFP since they were close to the schools with SFP. The total population was divided into 2 groups (SFP and non-SFP schools).

To come up with the sample size, simple random sampling was used with the use of random number tables. Each case of the sampling frame was numbered with a unique number. The first case was numbered 0, the second 1 and so on. Starting with the first random number, the random numbers were read off in a regular and systematic manner until the sample size was used. The numbers were sampled with a replacement to avoid read off a second time.

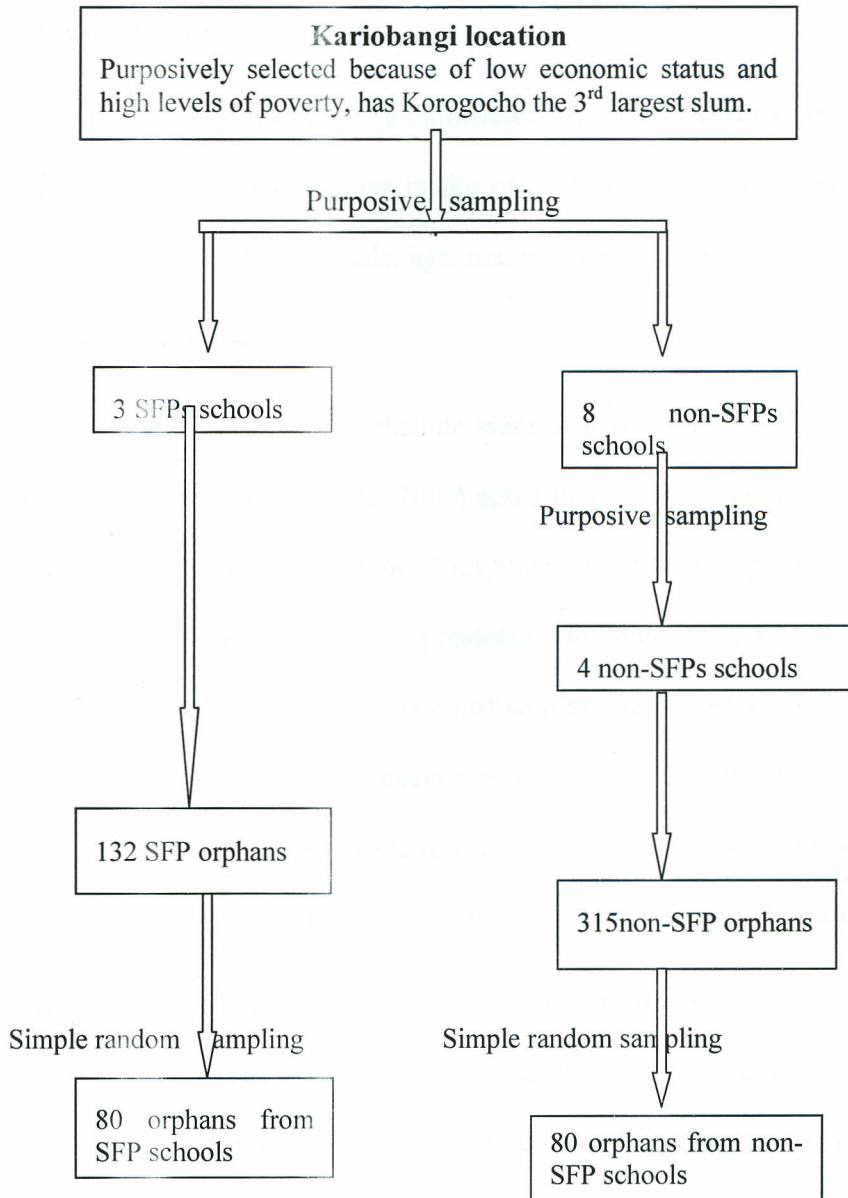


Figure 3.1: Sampling procedure

3.6 Data Collection instruments

The study used a questionnaire (Appendix IV) and interview schedule (appendix V) to collect data from both the guardians/caregivers of the orphans, meal servers and class teachers of the orphans.

3.6.1 Questionnaire

The guardians/caregivers were administered with a questionnaire to provide information with regard to dietary intake of orphans, morbidity patterns and socio demographic factors, which include; age, sex, religion, education and income.

3.6.2 Interview schedule

The questions in the interview schedule were a mixture of open-ended and closed ended questions. Kothari and Pals (2004) noted that whereas the open-ended types of questions give respondents freedom of response, the forced response types facilitate consistency of certain data across respondents. The interview schedule was ideal for this study, as it enabled quick collection of similar data across a relatively dispersed population. Using a pre-designed interview schedule ensured that information sought was relevant to the objectives of the research, was standard and focused the research on collecting the information rather than thinking about what information to collect.

The instrument was used to collect information from the guardians/caregivers, meal servers and teachers. The interview schedule used were two, where one (Appendix V) was used to collect information regarding school feeding programme from the teachers in charge of SFP. The second (Appendix VI) was used to collect information from guardians/caregivers, class teachers and meal servers in regard to the 24hr recall. To collect information on the 24hr recall a questionnaire was first used with the guardians/caregivers to give details of meals consumed by the orphan during breakfast, morning snack, afternoon snack and supper. The meal servers in SFP to gave information on the proportion of meals consumed by the orphan during lunch hour. The meal servers and class teachers were also asked to provide information on

food preparation methods and the ingredients used to prepare the school lunch, amount served and leftovers by the child.

3.6.3 Anthropometry

Anthropometric data was collected to determine the nutritional status. To obtain anthropometric data, heightmeters were used to determine height and bathroom scales were used to collect weight of the orphans respectively.

3.7 Data collection procedures

The dietary assessment was carried out both at home and in school so as to determine the caloric, protein and micronutrient intakes. The meal servers gave information on the school meal and how it was prepared while the guardians gave details of meals prepared at home.

The nutrient intake of the orphans was assessed using 24-hour recall and 7 day food frequency. The 24-hour recall method was used because it was inexpensive, easy and quick with low respondent burden and high compliance. It was the most suitable method since most of the respondents were of low level of education. In this method, the guardians were asked to remember in detail the type and quantities of food consumed during the previous 24 hours. Details of ingredients used, food preparation methods and equipments were taken. The amounts served to the children and any leftover foods were also recorded. This information was then used to determine the child's dietary intakes. These intakes were then listed down.

Household food frequency (an estimate of how often various types of food and drinks are ingested) in a week was carried out by asking the respondents the types of food they ate and how often they ate them. The 7-day food frequency was used to explain

the 24-hour recall results. The figures so obtained were compared against estimates for the recommended dietary intakes for the various food categories. Dietary diversity scores were calculated by summing the number of food groups over the 24 hours recall period. In this study the DDS was based on 14 food groups, cereals, Vitamin A rich vegetables and tubers, white tubers, dark green leafy vegetables, Vitamin A rich fruits, organ meat, Flesh meat, eggs, fish, legumes, nuts and seeds, milk and milk products, oils and fats.

The height of the orphans was taken using a length meter. The child was asked to stand barefooted on the flat surface with feet parallel to each other. The child's head was held upright and the headpiece lowered to make contact with the head crushing the hair gently. The reading was taken three times to the nearest 0.1 cm and the average was calculated. The weight was measured using a bathroom scale. The lightly dressed child was asked to stand on the bathroom scale and the reading was taken to the nearest 0.1 kg. The accurate ages of the children was determined by examining documentary evidence of the birth date such as birth certificate and clinic cards.

3.8 Pre-testing of the Research Instruments

The research instruments were pre-tested using 10% of the actual sample size which gave 45 respondents; of this 13 respondents were interviewed from school feeding programme and 32 from a non-school feeding. The respondents were selected randomly since the two groups had different number of respondents. The pretest was done in preparation for the major study. The instruments were tested for their reliability to the major study for consistency while the items were tested for validity for clarity of the findings. The instruments were pretested to check whether they were

meeting the research objectives. They were later adjusted to proceed with the major study.

3.9 Data Analysis

Data analysis was carried out using Statistical Package for the Social Sciences (SPSS v18), anthropus software for nutritional data relating to the Z-scores and Nutri-survey v3 software for dietary intakes. Results obtained using 24-hour recall were analyzed using Nutri-survey software to establish the total amount of selected nutrients in the meals consumed per day. The amounts of nutrients consumed per day were then compared with the RDA to determine dietary adequacy (Sehmi, 1993).

SPSS was used to analyze the Z scores for the two groups and perform comparative analysis. Comparison of the means of the Z scores of the children participating in the SFP and those not participating was done using paired samples t-test while the morbidity experiences, nutritional status and nutrition adequacy of the two groups were compared using Pearson's chi-square test.

The standard deviations complemented the means by informing about the dispersion of the scores or measures around the mean of each variable and by giving information regarding the extent of individual differences in a given variable. Frequency distribution tables showed how many times a score or response occurred and percentages gave the proportions of a subgroup to the total group-very useful in cases where there was a need to see the differences between, for instance, male and female responses.

The t-test procedure compared the means of two variables for a single group. It computed the differences between values of the two variables for each case and tests

whether the average differs from zero. This enables a comparison of the means of the two groups (Kothari, 1993). The Pearson's Chi Square test procedure tabulates a variable into categories and computes a Chi Square statistic.

Anthroplus computer package was used to generate anthropometric indicators which were used to assess the nutritional status of the study children. These indicators include WFA (underweight), HFA (stunting) and (BAZ). HFA was used to express the height of the child as a percentage of the expected height for a standard child of that age. BAZ was used to express the BMI of the child and age of the child as a percentage of the expected weight and height for a standard child of that age as given by WHO (2006). Stunting is a long term (chronic) consequence of malnutrition and may not reflect as a consequence of short-term illnesses. BAZ assess thinness (Low BMI for age) and obesity (high BMI for age. Z scores were generated and used to classify the school children into categories based on nutritional status cutoffs.

The information from the teachers in charge of the SFP was collected and analysed qualitatively by the researcher since the respondents were only three. The qualitative data was on the challenges and success of SFP which targeted the teachers in charge. This was done by picking the most said variables in the selected items on the instrument; again the data could not have been computed since the schools in SFP programmes were three and each had only one teacher in charge.

Multiple logistic regression was used to predict the factors affecting nutritional status of orphans. The Odds ratio statistic was used to interpret the results.

3.10 Logistical and Ethical Consideration

Before conducting the research, permission and clearance was obtained from the Ministry of Education in order to carry out the research through the school of graduate studies, Kenyatta University. To gain consent from the respondents the purpose of the study was well and clearly explained to them also the study frequently used acronyms and synonyms to maintain confidentiality. The respondents were also assured that no information received from the study was to be disclosed to any unauthorized persons. Only the required data was collected and used for the purpose of the study.

CHAPTER FOUR: RESULTS AND DISCUSSIONS

4.1 Demographic and socioeconomic characteristics of orphans

4.1.1 Demographic characteristics of orphans

The demographic characteristics of the orphans in the SFP and those not in the SFP were established. These included age, sex, and orphan status, type of caregiver, age and education level of caregiver. The distribution of children by sex and age and their orphan status is shown in Table 4.1.

Table 4.1: Distribution of demographic characteristics of the orphans

Variable	SFP		Non-SFP		P-Values
Sex	N=80	Percent	N=80	Percent	0.530
Males	38	47.5	42	52.5	
Females	42	52.5	38	47.5	
	80	100	80	100	
Age (Yrs)					0.020*
5- <7	15	19	29	36.2	
7- <9	47	58.2	31	38.8	
9-<10	18	22.8	20	25.0	
	80	100	80	100	
Orphan status					0.093
Single orphan	64	79.5	72	90.0	0.071
Total orphan	16	20.5	8	10.0	0.095
	80	100	80	100	

*Significant at 0.0 level

In the SFP the proportions of males (47.5%) was equal to the proportion of females (47.5%) in the non-SFP. The same case applied to the proportion of females in the SFP (52.5%) which was the same with the proportion of males in the non-SFP (52.5%). The age category with majority of the study subjects was that for 7-9 years for both feeding programme (58.2%) and non-programme (38.5%). The differences in ages 5-7 years for the two groups were found to be significant at $p < 0.05$. The mean age of the children was 8.1 years in the programme and 7.7 years for children not in the feeding programme. Dietary requirements and thus attainment of recommended nutritional status have been observed to vary depending on the child's gender (UNESCO, 2004).

Similarly the prevalence rates of stunting and underweight are related to the age of the child (Imran and Butt 2006). Majority of the orphans in SFP (79.5%) and non-SFP (90 %) were orphans who had lost one parent (single orphans). Orphans who had lost both parents (total orphans) in the non- SFP (20.5 %) were twice the number of those in the SFP (10%) although this was not significant at $p < 0.05$. Total orphans are more likely to be vulnerable than single orphans because they have lost both parents.

4.1.2 Social -Demographic characteristics of the households

Table 4.2 shows the distribution of social-demographic characteristics of the households visited. The study found out that caregivers who were fathers were 8.7% in the SFP and 20% in the non-SFP while mother caregivers were around 47.5% in the SFP and 62.5% in the non-SFP. Guardians were 43.8% in the SFP and 17.5% in the non- SFP.

Table 4.2: Distribution of Social Demographic Characteristics of the caregivers

		SFP		Non-SFP		p-value
		N	%	N	%	
Type of caregiver	Father	7	8.7	16	20	<.001
	Mother	38	47.5	50	62.	
	Guardian	35	43.8	14	17.	
	Total	80	100	80	100	
Age group of the caregiver	16-20	-	-	3	3.8	.005
	21-25	7	9.3	17	21.	
	26-30	12	16.0	21	26.	
	31-35	14	18.7	17	21.	
	36-40	18	24.0	8	10.	
	41-45	12	15	4	5.1	
	46-50	4	5.0	5	6.4	
	51-55	3	3.8	3	3.8	
	56-60	3	3.8	2	2.5	
	60-70	7	8.8	-	-	
	Total	80	100	80	100	
Education level of the caregiver	No formal schools	16	20	3	3.7	.007
	Std 1 –8	42	52.5	60	75	
	Form 1 – 4	15	18.7	15	18.	
	College	7	8.8	1	1.2	
	Adult literacy	0	0.0	1	1.3	
	Total	80	100	80	100	

Forty four percent of orphans in SFP and 17.5% in non SFP (14) were being taken care of by distance relatives who are not their immediate parents. The type of caregiver will influence the kind of care given to the orphans if the orphan is being cared for by one surviving parent they are better than those under the care of distance relatives. Caregiver's gender also influences the household's dietary intake (Krishna, Michelle, Frank and Edmond 2011).

This study showed significance $p < 0.005$ for the age group of the caregiver and the quality of care given to the orphans. Having a 16.0% of age bracket of 26-30 in SFP showed more caregivers in SFP (20%) had no formal schooling as compared to those in non SFP (3.7%).

The education level makes a great contribution to the occupation of a person and in determining their income. Studies have shown that households with educated mothers had children with better zinc status than households with low levels of education (Brown and Peerson, 1998). Children whose caregivers have no formal education tend to have a lower nutritional status than those children of more-educated caregivers (Imran and Butt, 2006).

Table 4.3: Distribution of economic characteristics of the households

		SFP		Non-SFP		P-value
		N	%	N	%	
Food expenditure/week in Ksh	1-500	35	43.7	40	51.3	0.404
	501-1000	33	41.3	32	41.0	
	1001-1500	12	15.0	8	7.7	
	Total	80	100	80	100	
Occupation of the caregiver	Permanent employment	5	6.3	4	5.0	0.220
	Casual laborer	15	18.8	25	31.2	
	Business	36	45.0	31	38.8	
	Student	7	8.7	8	10.0	
	Unpaid workers	17	21.2	12	15.0	
	Total	80	100	80	100	

The economic characteristics (occupation of the caregiver, weekly food expenditure and income) of the households are shown in Table 4.3. Eight point seven percent (8.7%) of the caregivers in the SFP and 10 % in the non-SFP schools were not engaged in any paying employment. Only 6.3% from the SFP and 5.0% from the non-SFP had permanent jobs. About 45% of caregivers in SFP and 38.8% in the non-SFP schools were engaged in business activities. These results are contrary to other similar studies by Mishra *et al.* (2005) where majority of the respondents (44%) were employed while 20 % were not under payment and 35% were not employed at all. Employment status of a household enhances the household's accessibility to income. It may also have a negative effect on the nutritional status of the orphans as it reduces the primary caregiver's time for childcare (Mishra *et al.*, 2005).

The summary for weekly food expenditure is shown on table 4.3 above, whereby it was determined by establishing how much money was spent on named foods in a week. The study showed that most households in the two groups spent up to 1,000 shillings per week on food (85.0% in the SFP and 92.3% in the non-SFP). About 43.7% of households in the SFP and 51.3% of the non-SFP spent less than 500 shillings on food in a week, while 41.3% in the SFP and 41.0% of non-SFP spent between 500-1,000 shillings on food per week. The rest spent between 1,000-1,500 shillings on food per week.

The average spending on food was 631.15 ± 335.76 shillings for the SFP and 517.20 ± 290.7 shillings for the non-SFP. About 60% of the monthly income in the SFP and 56% in the non-SFP was spent on food. There was no significance difference on food expenditure between the two groups at $P < 0.05$. The t- test value of 0.154 also

revealed no statistical differences at $p < 0.05$. The results are similar to those of a study done on orphans in Tanzania and Burkina Faso by Ntozi *et al* (1999) where about 21% of orphan's households from Tanzania and 22% of orphan's households from Burkina Faso could not meet their food needs, while 41% and 25% in the two countries respectively could not meet their schooling needs. On the contrary, studies done by Nyambedha *et al.*, (2003) indicated that 84% of the households mentioned schooling problems (buying school books, uniforms,) while only 48% reported lack of food. Food expenditure is related to income levels; higher income will result in increased food expenditures.

Around 32.9% from the SFP and 9.1% of non-SFP earned between 5000 and 10,000 Ksh as indicated in table 4.3 above. There was a statistically significant difference in income, between the two groups at $p < 0.404$. The SFP groups recorded a higher frequency of earnings greater than Ksh. 5,000 compared to the non-SFP group. The former then must be able to better provide for the orphans than the latter.

Table 4.4: The average (SD) monthly income for SFP group and non-SFP

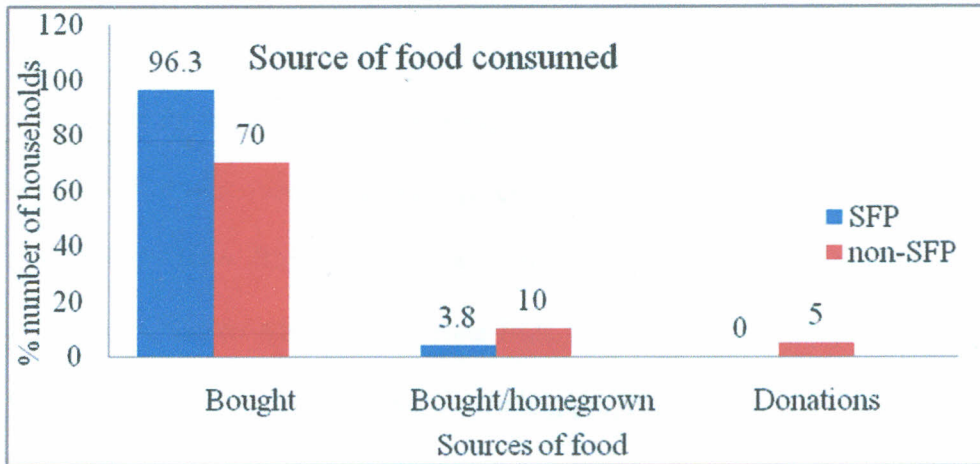
	N	Group	Mean	Std. Deviation
Household	79	SFP	3922.7848	1419.63785
monthly income	78	Non-SFP	3523.0769	1625.50991
Total	157		3724.2038	1521.19223

The average (SD) monthly income was $3,922 \pm 1,419$ shillings for the SFP group and $3,523 \pm 1,625$ shillings for the non-SFP as summarized on table 4.4. Further analysis shows that the average (SD) monthly income for all households was $3,724 \pm 1,521$

shillings as indicated on table 4.4. Independent t-test shows that there is a significant difference for income between the two groups. This means that average incomes for the two groups differed widely and that the difference is not spurious i.e. due to chance but actually exist in the target population.

High income implies high socio-economic status; people in high socio-economic groupings are able to better provide for families and are more aware of the nutritional value of different foods and RDA (Bogue *et al.*, 2005). Nutritional level of the orphans will thus reflect the income status of the caregivers. Turrel (1998) argues that socio-economic status is a complex phenomenon predicted by a broad spectrum of variables often conceptualized as a combination of financial, occupational and educational influences. Sharma and Manoranjan Kali (1990) result highlighted that increase in per capita income level increased the percentage of well-nourished and normal children. Socio-economic status is one of the strongest predictors of a person's morbidity experiences and reflects different individual and societal forces associated with health and disease.

Figure 4.1: Sources of Food Consumed in the Households by Group



The major source of food consumed in the households was established as shown in Figure 4.1

The study indicated that most of the foodstuffs consumed in the households for both programmes of orphans were purchased from the market, 96.3% for the programme households and 70% for the non-programme households. A small percentage of the households were found to grow some of the foodstuffs used for consumption to compliment the food that is bought (10% and 3.8% for the non-programme and programme households respectively). It was also noted that donations were received by 5% of the non-programme households while the programme households received none. The differences on the sources of foodstuff between the two groups were not significant at $P < 0.05$. Sources of food influence nutritional status depending on whether they are bought or homegrown. If bought, then other factors like income and food expenditure come to play and influence nutritional status.

4.2 Determination of Nutritional Status of orphaned children in the two programmes

The results for the nutritional status using the different indices are shown in table 4.5. In the SFP, it was observed that the percentage of orphans that showed signs of acute malnutrition (low BMI for age) was higher (16.5%) than children in the non-SFP (5%). Children who had moderate BMI for age in the feeding programme were thrice (15.20%) than those in the non-feeding programme (5%). Further tests revealed that these differences found between the two groups were significant at $p=0.019$. Therefore in terms of BMI for age, the hypothesis was rejected. Since children in the SFP had lower Z scores for BMI for age than those in the non-SFP one would conclude that the SFP intervention was correctly targeting victims of short-term consequences of malnutrition.

Table 4.5: Prevalence of Malnutrition among orphans in the Feeding Programme and Non Feeding Programme

Indicators	SFP N=80		non-SFP N=80		P	
	N	%	N	%		
Low BMI for age	Moderate (≤ -2 SD)	12	15.2	4	5	0.019
	Severe (≤ -3 SD)	1	1.3	0	0	
	GAM (≤ -2 SD)	13	16.5	4	5	
Underweight	Moderate	13	16.5	1	1.2	0.071
	Severe (≤ -3 SD)	3	3.8	7	8.8	
	GU/W (≤ -2 SD)	16	20.3	8	10	
Stunting	Moderate (> -3 to < -2 SD)	14	17.9	10	12.5	0.903
	Severe (≤ -3 SD)	1	1.3	6	7.5	
	GS (≤ -2 SD)	15	19.2	16	20	

GAM: Global acute malnutrition, GU/W: Global Underweight: GS: Global stunting

The prevalence of chronic malnutrition manifested as stunting was higher in the SFP (19.2%) compared to the non-SFP (20%). About 17.9% of the SFP and 12.50% from non-SFP were moderately stunted while 7.3% and 1.3% of orphans were severely stunted. However, there was no significant difference between the two groups at $p < 0.05$. The hypothesis was accepted based on the levels of stunting. Stunting is a long term (chronic) indicator of malnutrition and the short time frame for this study may not be adequate to effectively assess this index.

The results further showed that cases of underweight were more in the SFP (20.3%) than the non- SFP (10%). Although 17.9% of the SFP were moderately underweight compared to (12.5%) in the non-SFP. More than half of the children in the non-SFP were severely underweight (8.8%) compared to those in the SFP (3.8%). There was no significant difference between the two groups at $p=0.0701$.

Based on the underweight levels, the hypothesis: there is no significance difference between the orphans participating and those not participating in school feeding programme' is accept. Figure 4.2 shows the prevalence of global malnutrition between the two groups.

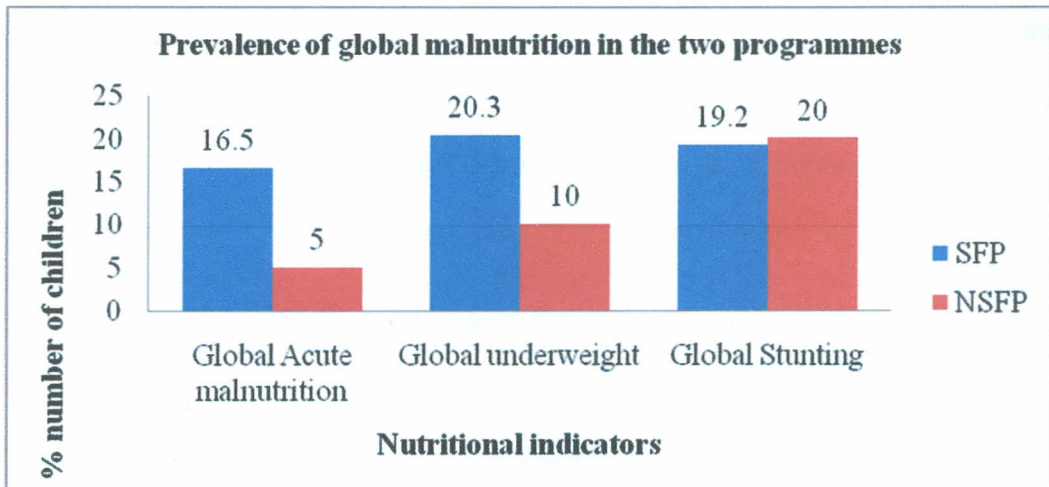


Figure 4.2: Prevalence of global malnutrition among orphans in the school feeding programme and non school feeding programme

An independent sample t-test was used to compare the nutritional status between the two groups. The results are shown in table 4.5.

Table 4.6: Mean Z-Scores for School and Non-School Feeding Programme

		N	Mean	Std. Dev.	t-test for equality of means	P-values
Underweight Scores	Z NSFP	57	-0.69	1.19	2.67	.009*
	SFP	58	-1.32	1.34		
Stunting Z Scores	NSFP	57	-0.53	1.56	2.08	.040*
	SFP	58	-1.12	1.49		
BMI-for-Age Scores	Z NSFP	57	-0.49	.89	2.25	.026*
	SFP	58	-0.90	1.06		

***Significant at $P < 0.05$; Cutoff points for Z scores source WHO, 2006**

There were significant differences between the Z scores means of the two groups at $P < 0.05$ for underweight, stunting, and low BMI for age. The SFP orphans indicated lower Z score means values compared to non-SFP. These are ranging from -0.49 to -

1.32 with a high deviation from the mean. This is inconsistent with the overall incidence of observed malnutrition in the SFP sample which is higher than in the non-SFP. High dispersion from the mean implies that individual orphans differ widely in their malnutrition levels. However, the Z scores are within the normal range.

The findings of this study highly differ from the national data, where 35% of the children are stunted compared to 19.2% from the SFP and 20% in the non-SFP. Nationally, the children with wasting of 7% are almost similar to 5% from the Non-SFP who have low BMI for age, but much lower than the SFP group that had thrice the number of those who were thin for their weight (16.5%). The 20.3% of underweight children from the non-SFP almost compares with national figures of 16% (KNBS/ICF MACRO, 2010). Other studies also indicate a rather bleak picture of the nutritional status of school going orphans.

4.2.1 Determination of nutritional status according to orphan's parenthood

The study sought to establish nutritional status of the children depending on their orphan status. The results are shown in table 4.7.

Table 4.7: Nutritional status according to type of orphan's parenthood

Type of the caregiver	BMI for Age		WAZ		HAZ	
	Low	Normal	Low	Normal	Low	Normal
Mother dead	3 (8.3%)	33 (91.7%)	7 (19.4%)	29 (80.6%)	4 (10.8%)	33 (89.2%)
Father dead	9 (9.3%)	88 (90.7%)	21 (21.6%)	76 (78.4%)	16 (16.5%)	81 (83.5%)
Both dead	5 (21.7%)	18 (78.3%)	3 (13.6%)	19 (86.4%)	4 (18.2%)	18 (81.8%)
X ²	X ² =3.43	P=0.33	X ² =0.98	P=0.81	X ² =1.01	P=0.80

*Significant at P<0.05; **Significant at P<0.001

The findings indicated that among the children with low BMI for age, 9.3% had lost their father, 8.3% had lost their mother and 5% had both parents dead. For the underweight children (21%) had their fathers dead compared to (19% and 3%) whose mothers and both parents were dead respectively. About 18.2% of children with both parents dead were stunted compared to (10.8% and 16.5%) whose mother and father are dead respectively. These results were not significant at $p < 0.05$.

These findings showed that those orphans who were under the care of their mothers had non-significantly better nutritional status as compared to those who were under the care of their fathers. Due to an error of smaller sample size of this study, it differs from other studies which have consistently shown that females were significantly more likely than males to comply with dietary recommendations which translate to better nutritional status (Monneuse et al., 1997). Similar findings by Bicego *et al.*, (2003) found out that, the loss of a mother was more detrimental as compared to the loss of a father in terms of schooling and nutritional status. In other words the maternal orphans are usually susceptible to being stunted as compared to the non-orphans due to the loss of their primary caregiver.

The study also differs with findings from Monasch and Boerma (2004) where the orphans who were taken care of by their distance relatives as well as caregivers who are not related to them were malnourished as compared to the orphans who were taken care of by their close relatives. This study further showed that orphans were less likely to attend school as compared to the non orphans due to nutritional issues. Adverse effects were noted on double orphans with none of their parents alive. According to Buttriss (1997) females were far more knowledgeable about issues

relating to diet and health than males. Thus, those orphans staying with their mother or female guardians are expected to benefit more from good nutritional practices as opposed to those staying with fathers or male guardians.

4.3 Morbidity Status of the Orphans

The study sought to establish the diseases suffered by orphans in the two groups under study during the previous two weeks. Around 96.3% of orphans in the non-SFP had been sick during the previous two weeks prior to the survey, compared to 80% in the SFP. However, there was no significance difference between the two groups at $P < 0.05$. Majority of those who had been sick within that period of time in the SFP were females (43.75%) compared to males (36.25%). However, more males (52.5%) than females (45%) were sick in the non-SFP. These differences were not significant at $P < 0.05$ level.

The specific disease prevalence during the previous two weeks was established and the results are shown in figure 4.3. The common cold /cough was the common illness across the two groups .Out of those who had been sick two weeks prior to the study, about 76.3% in the SFP and 98.8% in non-SFP had both cold and cough. It was also noted that among the diseases the orphans suffered in the previous two weeks, diarrhea was not experienced among children in the non-SFP. However, it was experienced by only 1.3% of children in the SFP.

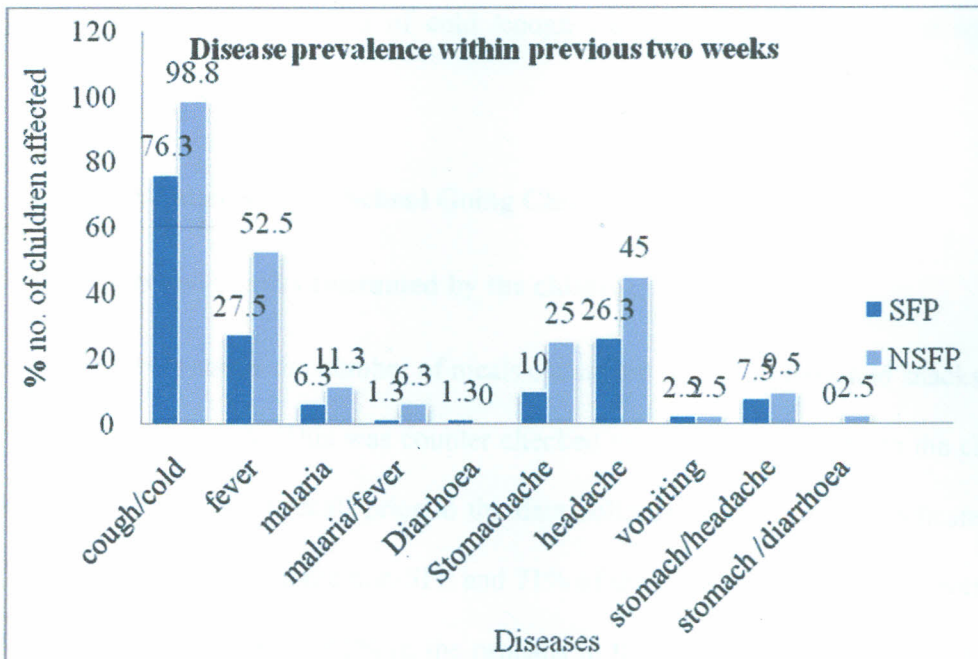


Figure: 4.3: Disease Prevalence within the previous two weeks

Vomiting was experienced by equal proportions of the two groups (2.5%). Headache and fever were the other common illnesses among orphans in the feeding and non-feeding group with (26.3% and 45%) and (27.5% and 52.5%) respectively. Chi square tests show that there was a significant difference at $P < 0.05$ between the two groups for colds/coughs and fever. This analysis brings out the fact that the non-SFP group experienced higher levels of morbidity than the SFP group. Nutritional status is linked to the levels of morbidity in a study group. The morbidity status of an individual is influenced by and also influences the dietary intake and utilization of nutrients in the body and consequently the nutrition status.

The findings of this study showed that more orphans in the non-SFP were sick in two weeks prior to the study compared to the orphans in the SFP. The common illnesses frequently experienced by the two groups were common cold / cough and fever. The

levels of morbidity in terms of cold /cough were significantly higher in non-SFP group than the SFP group.

4.4 Dietary Intakes of the School Going Children

4.4.1 Meals and snacks consumed by the children

The caregivers stated the number of meals consumed by the orphans and snacks taken by the child in a day. This was counter checked with the meals given to the child in the previous 24- hour recall prior to the data collection. The findings indicated that 92.5% of the orphans in the non-SFP and 71% of the orphans in SFP were given food three times a day. About 7.5% of the orphans in the non-SFP and 23.8% in the SFP received food twice a day. The average number of meals consumed by the children in the SFP was 2.66 while those consumed by children in the non SFP was 2.92.

The most missed meal by majority of the children in the SFP (72.7%) was breakfast. The findings indicate that the orphans especially those in SFP were consuming fewer meals than the recommended more than five meals per day. The children in this age category of 5-10 years are not only physically active but they are also growing at a very fast rate and therefore need more meals to meet there daily energy requirement. For both groups, 70% carried snacks to or from school. The main snacks consumed by the children in the SFP were sweets (25%) chips (4.2%) avocado (41.7%) *maandazi* (12.5%) cakes (4.2%), *samosa* (4.2%) while the main snacks consumed by the non-SFP were sweets (17%) chips (26.1%) avocado (30.4%) and bananas (21.7%).

A higher proportion of the non-SFP group consumed various snacks compared to the SFP group. Snacks are important because they supplement the nutrients consumed from the main meals. The main snack for the SFP group was avocado while the main snack for the Non SFP was banana. No child in the feeding programme missed lunch. This was evident because it was the main meal provided in schools.

4.4.2 Food Frequency Intakes/Dietary Diversity

The researcher collected information about how often various types of foods were consumed on a weekly basis for both groups. This was done by estimating the number of times a given food type was consumed per week, ranging from zero to a maximum of 5-7 times a week. The frequency of consumption of the various foods was a proxy of the relative intake of various dietary requirements and their adequacy. Table 4.8 shows the frequency consumptions of the various food groups, carbohydrates, proteins, fruits and vegetables for children in the two groups.

The two groups consumed a variety of foods rich in carbohydrates. These included chapatti, rice, *ugali* and maize. *Ugali* was the most frequently consumed cereal by 72.6% of orphans in the SFP and 58.9% in the non-SFP consuming it 5-7 times in a week. Maize was the other highly consumed cereal by 58.8% of orphans in the SFP (5-7 times/week) and 50.1% of the non-SFP (1-2 times respectively in a week). The least consumed carbohydrate rich food in the SFP was *chapatti* (63.8% did not consume it). In the non-SFP only 48.8% of the orphans did not consume *chapatti*.

Roots and tubers consumed by the orphans were *matoke* (green bananas), Irish potatoes and sweet potatoes. This food group was rarely consumed with more than

half of the children in the two groups not consuming any of them throughout the week. Irish potatoes were consumed more by children in the SFP (28.9%) than in the non-SFP (23.8%) at least once in a week (cumulative figures). The least consumed was matoke. About 91.3% of orphans in the non-SFP and 80% from the SFP did not consuming it at all throughout the week.

Table 4.8: Weekly food consumption frequency

Food	Feeding Programme				Non-Feeding Programme			
	Time Consumed/Wk-%				Time Consumed/Wk-%			
	0	1-2	3-4	5-7	0	1-2	3-4	5-7
Carbohydrates								
Chapatti	63.8	20.1	6.30	10.0	48.8	36.3	8.80	6.30
Rice	25.0	36.3	23.8	15.1	23.8	46.3	17.6	2.50
Ugali	1.30	7.50	18.8	72.6	0	13.8	27.5	58.9
Maize	1.30	20.1	20.1	58.8	32.5	50.1	7.50	10.0
Matoke	80.0	13.08	2.60	3.80	91.3	6.30	2.50	0
Potatoes	52.5	26.3	11.3	10.1	72.5	22.6	5.00	0
Sweet Potatoes	71.3	21.3	2.50	5.10	76.3	22.5	1.30	0
Protein Rich								
Beans	0	38.8	30.0	35.1	25.0	54.3	8.80	10.0
Meat	46.3	35.1	13.8	5.10	42.5	35.0	11.3	1.30
Chicken	63.8	32.5	3.80	0	37.5	48.8	13.8	0
Egg	65.0	30.0	3.80	1.30	66.8	27.6	6.30	0
Milk	15.0	11.3	13.8	60.1	18.8	21.3	3.80	56.4
Vegetables								
Cabbage	18.8	33.8	31.3	16.3	18.8	45.1	31.3	5.0
Sukuma wiki	10.0	16.3	35.0	38.9	8.80	17.5	40.1	33.9
Carrots	76.3	12.6	5.00	6.30	78.8	17.5	2.60	1.30
Tomato	6.30	1.30	5.10	87.6	10.0	2.50	2.50	85.0
Peas	91.3	7.50	1.30	0	92.5	3.80	0	3.80
Fruits								
Oranges	45.0	28.8	7.60	18.9	57.5	32.6	7.50	2.60
Avocado	33.8	23.8	13.8	28.9	41.3	30.0	18.8	20.0
Passion Fruit	97.5	1.30	0	1.30	95.0	1.30	0	3.80
Mango	91.3	1.30	1.40	6.30	85.0	13.8	1.30	0
Pawpaw	96.3	0	1.30	2.50	98.8	0	1.30	0
Pineapple	96.3	1.30	1.30	1.30	95.0	3.80	1.30	0
Banana	53.8	22.5	17.6	6.30	51.3	40.1	2.60	6.30

Beans were the only legumes that were consumed by the children throughout the week. Majority of those in the feeding programme consumed beans more than those in the feeding programme. A quarter of the children in non-SFP did not consume any legume throughout the week. However, those in the feeding programme consumed beans at least once in a week with 35.1% of the children consuming beans throughout the week.

The two study groups also consumed protein rich animal products. These included beef, chicken, egg and milk. Milk was the animal product most frequently consumed throughout the week with 60.1% and 56.4% from the SFP and non-SFP consuming it 7 times in a week. Chicken and eggs were the least consumed animal products. About 65% from the two groups respectively did not consume eggs at all through the week. About 63.8% of the SFP and 37.5% of the non-SFP did not consume chicken at all through the week.

The other food group consumed was vegetables. These included cabbage, sukuma wiki (kales), carrots, tomatoes, green pea and traditional vegetables. These foods are rich in trace minerals. The most frequently consumed vegetable was the tomato by 87.68% of SFP and 85% of non-SFP consuming it 7 times in a week. The least consumed vegetable was the green pea with more than 90% of children from the two groups not consuming it at all throughout the week. More than three quarter of the study subjects did not consume carrots throughout the week.

The final group consisted of fruits, mainly rich in vitamins. These included oranges, avocados, passion fruit, mango, pawpaw, pineapple and ripe banana. The most

frequently consumed fruit was the avocado with 28.9% and 20% from the SFP and non-SFP consuming it at least once in a week. This fruit is rich in calories. The least consumed fruits were the passion fruit, pineapple, mango and pawpaw. These had about 90% and above of the children not consuming them at all throughout the week.

In summary, majority of the SFP group missed breakfast, while lunch was missed by orphans from the non-SFP. The findings show that the most frequently consumed carbohydrate by the two groups was *ugali*. There were more orphans from the SFP group who consumed *ugali* more often than the non-SFP group. Eggs were the most rarely consumed protein by the two groups while a higher proportion of the two groups consumed beans occasionally. Majority of the SFP group consumed cabbages occasionally compared to the non-SFP group which consumed *sukuma wiki* frequently. Both groups rarely consumed fruits. The most commonly consumed fruit by the two groups was Avocado.

4.4.3 Dietary Adequacy for orphans in both groups

The t-test was applied to compare the means of the two groups for nutrient intakes. The results are shown in table 4.9.

Table 4.9: Mean of nutrients consumption in the school feeding and non school feeding groups

	Programme	Mean	P-value
Total calories (g)	SFP	1585.1 ± 336	0.428
	Non-SFP	1535.5 ± 336.4	
Total protein (g)	SFP	52.3 ± 12.8	0.016*
	Non-SFP	46.2 ± 14.3	
Total vitamin A (µg)	SFP	230.8 ± 291.7	0.006**
	Non-SFP	386.9 ± 308.4	
Total vitamin C (mg)	SFP	77.8 ± 79.4	0.005**
	Non-SFP	116.4 ± 65.1	
Total iron (mg)	SFP	20 ± 5	0.000**
	Non-SFP	15 ± 5.4	

*Significant at P< 0.05; **Significant at P<0.001

The three nutrients used in table 4.8 vitamin A, vitamin C and Iron are vital for growth and development for young children and especially in school going children.

The means for proteins and iron intake were statistically significant at P<0.05. There was also a statistically significant difference in the means for vitamins A and C between the two groups at P<0.05. Dietary adequacy of orphans was determined by comparing the consumption of some selected nutrients with the RDAs. The figures 4.4 and 4.5 show the percentage adequacy of nutrients by each group of the study.

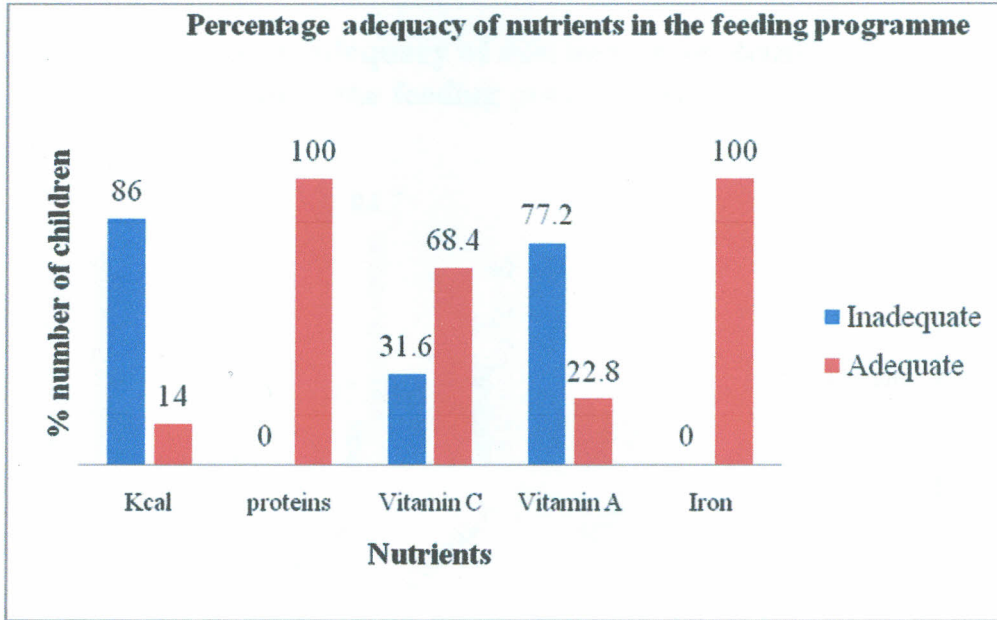


Figure 4.4: Percentage Adequacy of Nutrients for orphans in the feeding programmes

The figures show that almost all the orphans consumed adequate levels of protein and iron in each of the groups. More than half of the proportion of the orphans in the SFP had inadequate calories (86%), and vitamin A intake (77.2%).

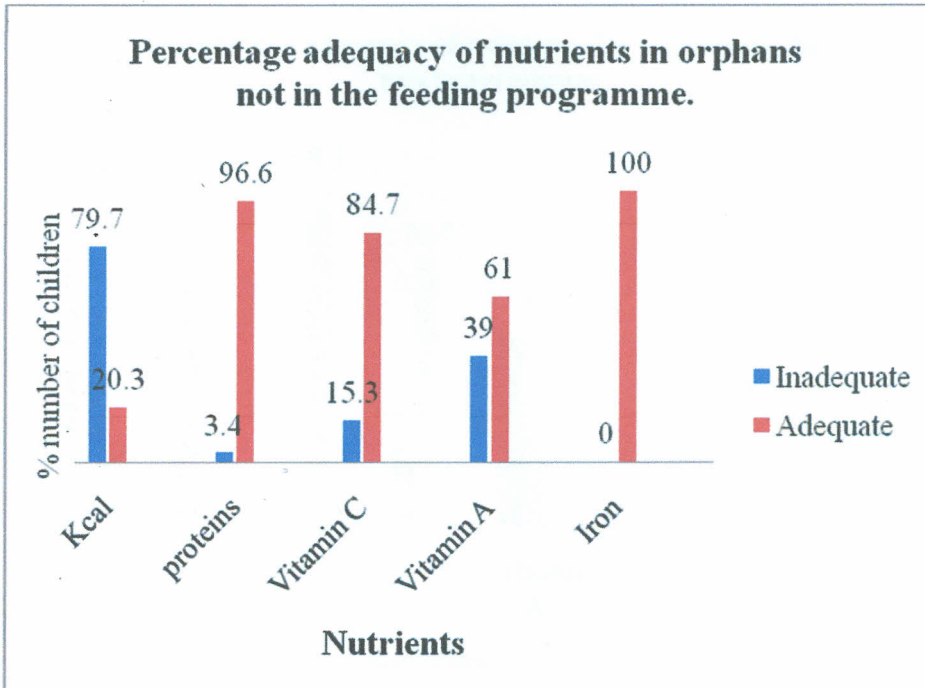


Figure 4.5: Percentage Adequacy of Nutrients for orphans not in the feeding Programme

Apart from the calorific intake (20.3%), the majority of the children in the non SFP had inadequate intakes of all the other nutrients, vitamin C intake (84.7%), Vitamin A intake (61%) and iron intake (100%). Further analysis showed that only the differences in vitamins A and C intake between the two groups were lowly significant at $p < 0.05$. Figure 4.6 shows the combined adequacy of nutrients for all the orphans.

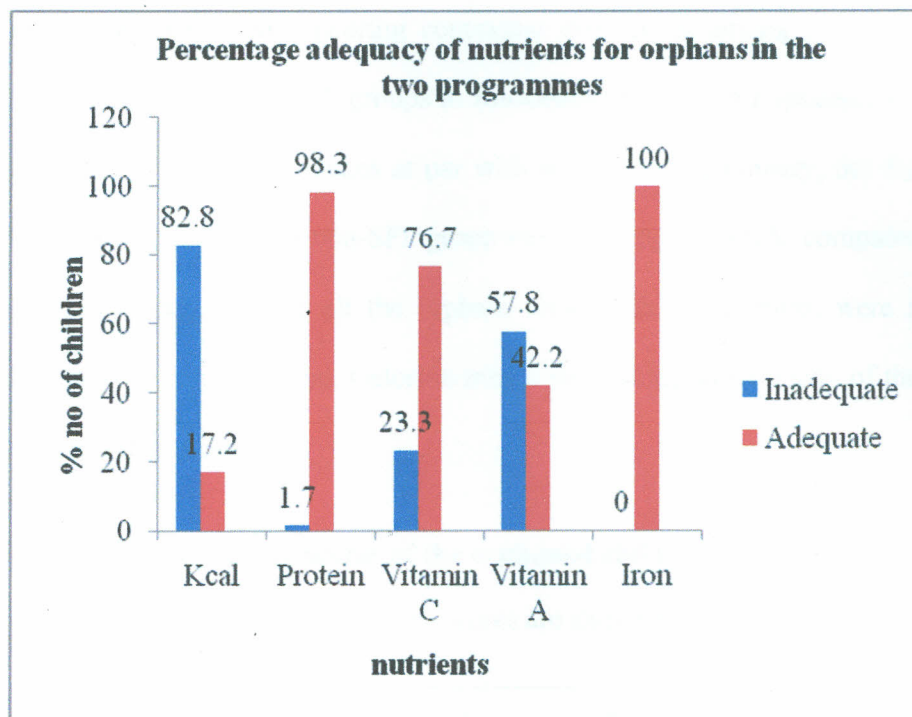


Figure 4.6: Percentage Adequacy of Nutrients for orphans in the two programmes

The results contradict Musse (2008) who sought to determine pre-adolescent pupil's dietary practices, nutritional status and their inter-relationships. The study group consisted of 400 mixed primary school pupils aged 10-11 years in Thika district. This study found that protein consumption was 28.5% below RDA, vitamin C consumption was 84.8% below RDA, iron consumption was 64.9% below RDA, while that of micronutrients, vitamins B6 and calcium was below the RDA.

Protein and vitamin C consumption was almost 100% in both groups and this could be explained by the fact that the area of study was near a dumping site and the residents could access cheap offal's from animal products like livers, kidneys, intestines and other animal products that increased their protein and vitamin C intakes. In terms of

dietary adequacy, and ignoring contextual differences among the study groups, it would appear that the SFP groups in Kariobangi and Thika populations have a lot to be done to bring their intakes at par with the RDA. In summary, the findings show that more orphans in the non-SFP group were meeting the RDAs compared to those in the SFP group. Almost all the orphans from both programmes were meeting the RDAs for protein and iron. Calorific intake was inadequate in many of the orphans in both programmes.

4.4.4 Dietary diversity scores of the orphaned children

The results for the dietary diversity scores are shown in figure 4.7.

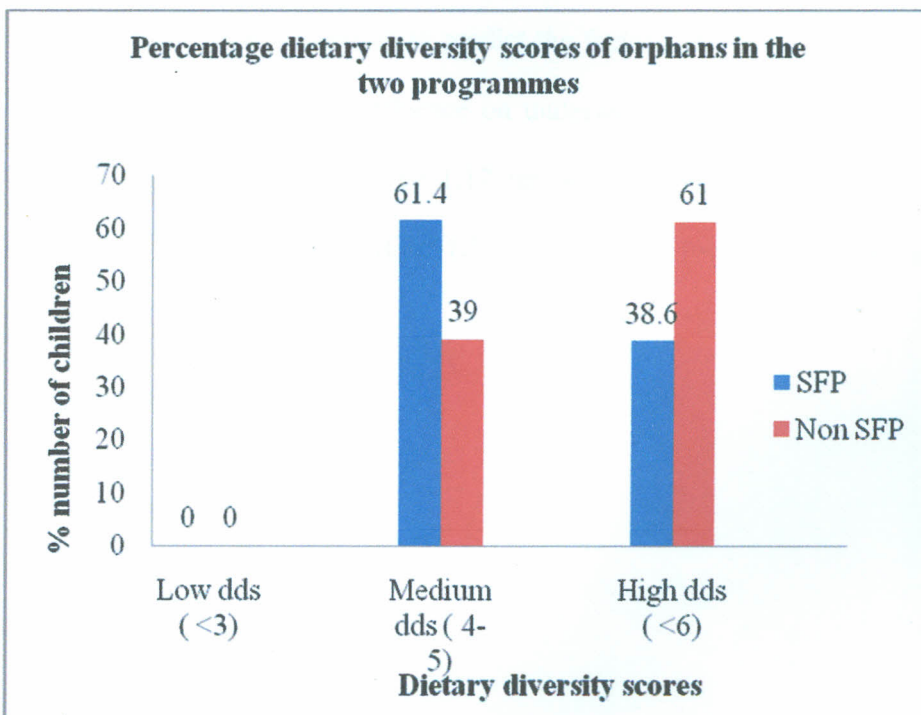


Figure 4.7: Dietary diversity scores for orphans in both programmes

According to the results none of the children consumed foods of low dietary diversity score in both groups while majority of the SFP consumed foods of medium dietary

diversity score compared to 39% in the non SFP. On the other hand, , 61% of the orphans in the non-SFP consumed foods of high dietary diversity score as compared to 38.6% in the SFP. The differences in dietary diversity scores consumed by the two groups were found to be significant at $p=0.016$. A t test computed for the mean food groups for the two groups indicated a mean of 5.3 and 5.6 for SFP and non SFP respectively although this was not significant at $P<0.05$.

4.5 Factors Affecting Nutritional Status

4.5.1 Factors associated with underweight in orphans

Table 4.10 shows the factors associated with underweight in orphans for each of the group. In a logistical regression to predict the factors, the sex of the orphan was not found to have a significant influence on underweight levels of the orphans in both groups. Males were found to be 1.17 times more likely to be underweight than females for both programmes (OR: 1.17. CI 0.39-3.51 $P=0.55$) although this was not significant.

Table 4.10: Factors associated with underweight in orphans

Variable	SFP				Non-SFP			
	OR	95%C.I.		P-Value	OR	95%C.I.		P-Value
Sex of orphan	1.17	0.39	3.51	0.777	1.57	0.35	7.09	0.553
Length of stay without father	1.03	0.79	1.35	0.779	1.05	0.75	1.46	0.763
Length of stay without mother	1.05	0.84	1.30	0.649	0.78	0.64	0.94	0.013*
Income of Household	1.00	0.99	1.00	0.252	1.00	0.99	1.00	0.928
Food expenditure	1.00	1.00	1.00	0.210	1.00	1.00	1.07	0.049
Education of caregiver	3.91	0.13	1.57	0.207	0.36	0.07	1.73	0.206
Kind of orphan	1.02	0.24	4.23	0.970	1.32	0.14	12.40	0.804
Who stayed with Orphan	0.97	0.32	2.97	0.971	1.66	0.29	9.26	0.559
Orphan sick in last 2 weeks	4.68	0.57	38.40	0.150				
Food groups consumed	1.48	0.69	3.14	0.307	1.62	0.53	4.93	0.393

*Significant at $P < 0.05$; **Significant at $P < 0.001$

The findings in the non- SFP revealed that children who stayed for long without their mothers were 0.78 times as likely to be underweight compared to those who had stayed for a short time without their mothers. (OR: 0.78 CI 0.64 -0.94 $P=0.013$). However, in the SFP, those who stayed without their mothers were 1.05 times more

likely to be underweight although this was not significant (OR: 1.05 CI 0.84 -1.3 P=0.649). Mothers are the primary caregivers and their loss means that the quality of care is affected. In one study, however, children who had lost fathers were more likely to be malnourished than the others (Lindblade *et al.*, 2003).

In the non-SFP, there was significant difference between underweight and food expenditure (OR: 1.00 CI 1.00. – 1.07 P=0.049). High food expenditure results in improved quality and quantity of food consumed in the households. As the monthly food expenditure increases, the orphans gain in weight and the WFA ratio increases resulting in higher Z scores and improved nutritional status. However, in the non-SFP, there was no significant difference (OR: 1.00 CI 1.00. – 1.00 P=0.25).

In the SFP, Orphans who were sick in the previous two weeks were 4.68 times more likely to be underweight although this was not significant. (OR= 4.68 CI 0.57-38.40 P=0.15). On contrary, findings from other studies (Mercedes, 2000, WHO, 2003b) reveal a positive relationship between morbidity and nutritional status. Similarly Mukoma (2002) study indicates that morbidity experiences of children were significantly related to their nutritional status.

4.5.2 Factors associated with stunting in orphans

Table 4.11 shows the factors associated with stunting in orphans. According to the findings from the SFP and Non SFP , a male orphan was found to be 2.34 as likely to be stunted than a female orphan in both programmes, although not significant (OR= 2.34; C.I 0.73- 7.50 p=0.15) and (OR= 2.34; C.I 0.73- 7.50 p=0.15) respectively There was no significant difference between those who had high income /high food expenditure and stunting in both programmes (OR= 1.00 CI 0.99-1.00 P= 0.78), (OR=

1.00; CI 1.00-1.00 P= 0.07). Similarly, there was no significant difference between the orphans and the length of time stayed without the father. (OR= 1.15 CI 0.87-1.53 P=0.30) and (OR= 1.15, CI 0.8- 1.53 P=0.3) in SFP and non-SFP respectively.

Table 4.11: Factors associated with stunting in orphans

Variable	SFP			Non-SFP		
	OR	95%C.I.	P-Value	OR	95%C.I.	P-Value
Sex of orphan	2.34	0.73 7.50	0.152	2.34	0.73 7.5	0.152
Length of time without father	1.15	0.87 1.53	0.303	1.15	0.8 1.53	0.303
Length of time without mother	0.72	0.59 0.89	0.002*	0.72	0.59 0.89	0.002*
Income of Household	1.00	0.99 1.00	0.782	1.00	0.99 1.00	0.782
Food expenditure	1.00	1.00 1.00	0.073	1.00	1.00 1.00	0.073
Education of caregiver	0.45	0.13 1.57	0.215	0.45	0.13 1.57	0.215
Protein intake				5.33	0.30 93.2	0.251
Kind of orphan	0.54	0.06 4.74	0.581	0.54	0.06 4.74	0.580
Who stayed with Orphan	0.61	0.12 3.09	0.559	0.61	0.12 3.09	0.559
Food groups consumed	1.04	0.49 2.21	0.917	1.04	0.49 2.21	0.917

***Significant at P< 0.05; **Significant at P< 0.001;**

There was a significant difference between the length of stay without the mother and stunting levels for both programmes. (OR=0.72 CI 0.59-0.58 P= 0.002). Those

orphans who have stayed for long without their mothers were stunted more than those who have stayed for shorter periods. Other factors that were non-significantly related to stunting levels were the kind of orphan that is, whether the orphan was single or total orphan (OR=0.54 CI, 0.06- 4.75 P= 0.581) for both programmes and the mean food groups (OR= 1.04 CI 0.49- 2.21 P= 0.917) in both programmes.

4.5.3 Factors associated with low BMI for age in orphans

Table 4.11 shows factors associated with low BMI for age in the SFP and non- SFP. Orphans who had stayed for a short time without their mothers were 1.3 times more likely to be thin than those who had stayed for a long time although this was not significant for both programmes (OR 1.3 CI 0.75-2.26 P=0.72). Food expenditure (OR: 1 CI 0.99-1.00 P= 0.82) and household income (OR: 1 CI 0.99-1.00 P= 0.82) were non-significantly related to low BMI for age of the orphans in both programmes.

Table 4.12: Factors associated with low BMI for age in orphans

Variable	SFP				Non- SFP			
	OR	95%C.I.		P-Value	OR	95%C.L		P-Value
Sex of orphan	0.28	0.02	2.85	0.286	0.28	0.02	2.85	0.286
Length without father	0.85	0.59	1.22	0.388	0.85	0.59	1.22	0.388
Length without mother	1.30	0.75	2.26	0.335	1.30	0.75	2.26	0.335
Income of Household	1.00	0.99	1.00	0.823	1.00	0.99	1.00	0.823
Food expenditure	1.00	0.99	1.00	0.721	1.00	0.99	1.00	0.721
Education of caregiver	0.73	0.07	7.60	0.798	0.73	0.07	7.60	0.798
Food groups consumed	7.99	1.04	61.32	*0.046	1.041	0.49	2.21	0.046

***Significant at $P < 0.05$; **Significant at $P < 0.001$**

The findings also showed that orphans in the SFP who consumed few food groups were 7.99 more likely to have low BMI for age than those orphans who consumed diets with many food groups. (OR= 2.15 CI 1.04-61.32 $p=0.046$). Few food groups result to monotonous diets that lack diversity to meet essential nutrients requirements, important for growth and development. Education level of the caregiver was the other factor that was not significantly related to low BMI for age for both programmes (OR = 0.73 CI 0.07-7.60 $P=0.798$). Similarly, Mukoma's (2002) study had no correlations

between the caregiver characteristics of education, nutritional knowledge and maternal availability for childcare with nutritional status.

Comparing this with Bosire's (2005) findings regarding nutritional status in agro-pastoralist and pastoralist communities although this is from a different setting, the availability and accessibility of the care resources determined the quality of the care given to the children and their nutritional status to a large extent. Distance to the water sources, post natal clinic attendance, immunization, family planning and the mothers age were the other factors significantly associated with malnutrition. Although the current study could not determine the relationship between morbidity and low BMI for age because of the small sample size, Atiamuja (2002) evidenced significant relationships between disease incidence and low and high academic achievers. Disease incidences were accompanied by a significant difference in wasting between the two groups.

In summary, the non- SFP orphans who had stayed for a short time without their mothers were 22% times less likely to be underweight compared to those who had stayed for long without their mothers. (OR: 0.78 CI 0.64- 0.94 P=0.013). There was also significant difference between underweight and food expenditure (OR: 1.00 CI 1.00 – 1.07 P=0.04) in the same programme. Orphans who stayed for a short time without their mothers were significantly stunted compared to those who had stayed for shorter periods without their mothers in both programmes. (OR=0.72 CI 0.59-0.58 P= 0.00) .In terms of low BMI for age, orphans in the SFP who consumed few food groups were significantly thinner compared to those who had consumed foods with many food groups. (OR= 2.15 CI 1.04-61.32 p=0.046).

4.6 Challenges and successes of the school feeding programme

One of the major challenge indicated by the interviewed teachers was that there was irregular supply of food which resulted to the orphans sometimes running for a whole term without the school meals. Another challenge was that parents were supposed to contribute by paying an agreed amount to pay the cooks but not all could afford and this affected the programme.

In terms of quality and acceptability of the supplied food, most of the cereals delivered were attacked by insects like weevils. This also tends to deny orphans an appetite to continue enjoying the served food in schools.

Though there were challenges according to the teachers, the programme had successfully met its objectives. The teachers reported that when there was no food supply, caregivers/guardians tended to transfer their orphans to schools providing these meals within Korogocho slums.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of the findings

This study looked at the nutritional status of orphaned children participating and those not participating in school feeding programmes. The social demographic characteristics, morbidity status, dietary intake and factors affecting nutritional status of school orphans aged between 5- 10years in Korogocho slums in Kariobangi location were determined. The information from this study will be vital for use in developing health and nutritional guidelines aimed at promoting good health among orphaned school children.

Socioeconomic and demographic characteristics of the households revealed that there were more maternal caregivers than there were paternal caregivers in both groups although the maternal caregivers were higher in the SFP. Significantly there were less household members who did not have a paid employment in the non-SFP than SFP. They recorded significantly higher frequency of earnings (greater than 5000 Ksh per month) than those recorded in the non-SFP. The weekly food expenditure was also non-significantly higher in the same SFP programme.

From the study, a higher proportion of malnourished children benefited from the School Feeding Programmes compared to those not in the programme; although only the BMI for age was significantly different for the two groups. The null hypothesis was rejected on the basis of low BMI for age but not rejected on the basis of underweight and stunting indicators.

More orphans in the non-SFP group were meeting their RDAs compared to those in the SFP group. The orphans from the non-SFP consumed foods of significantly higher dietary diversity score as compared to the orphans from SFP group whose majority of orphans consumed foods of medium dietary score. That could be the reason why non SFP group had significantly higher adequacy in more of the selected nutrients than the SFP group. Caregivers who knew that there were challenges in getting food would purposively select schools with a feeding programme. On the other hand the caregivers who knew that their children are not having meal in school they would go a step to provide them with diverse nutrients.

The findings of this study show that more orphans in the non-SFP were sick two weeks prior to the study compared to the SFP. The common illnesses frequently experienced by the two groups were common cold/cough and fever. They were also found to be significantly higher in non-SFP group compared to the SFP group. The factors that were found to affect nutritional status in the non-SFP were food expenditure and period of stay without the mother while the mean food groups consumed and period of stay without the mother were found to affect nutritional status of orphans in the non-SFP.

5.2 Conclusions

The SFP group indicated higher earning and also higher weekly expenditure compared to the non-SFP group. In terms of dietary diversity the SFP group indicated low dietary scores as compared to the non-SFP. In Korogocho the guardians/caregivers might be earning and buying food but may lack knowledge to combine the different food of the right nutritional value. Also they would buy food of

the right nutritional value but other inter-house food distribution factors may have come in place in determining quantity or quality of food that goes to the orphan.

Disease prevalence in cold and cough among the orphans two weeks prior to the study was found to be high and this could probably be due to congestion and overcrowding in the classrooms and the surrounding environment. The area didn't have enough water that can also be used in the schools for hand washing and drinking. In most cases orphans from areas such as Korogocho slums with such characteristics are prone to water -borne diseases like vomiting, stomachache and diarrhoea.

Having a three quarter of non-SFP caregiver's attained primary education, the study therefore concluded by reporting that they have higher level of awareness in terms of nutrition issues which can positively affect the nutritional status of the orphans.

The period of stay without the mother and the weekly food expenditures were found to affect underweight while stunting was only affected by the period of stay without the mother. Orphans who consumed foods of few food groups were found to be thinner compared to those who had consumed many food groups.

Though the hypothesis 'there is no significance difference in nutritional status between the orphans participating and those not participating in school feeding programme' was accepted in terms underweight and stunting; one would have expected significance differences since the programmes was offering an additional meal. Meanwhile, in terms of BMI for age the same hypothesis was rejected since more orphans were wasted in the SFP than those in non-SFP. Challenges faced within the providence of the programme like irregularities in food supply may have posed as a factor leading to poor nutritional status of orphans in SFP.

In Korogocho slums majority of caregivers would purposively select the schools with SFP which offers lunch since they have challenges in putting a plate of food on the table everyday thus making the nutritional status of orphans to differ. Since the non SFP group was consuming foods of high dietary diversity score they also had higher nutrient adequacy which led to a better nutritional status. Schools with SFP attracted a higher proportion of malnourished children.

5.3 Recommendations

5.3.1 Recommendations for practice

The school management should come up with ways of diversifying the school diets to improve on what is currently available for the programme to include vegetables, fruits and other foods like potatoes which would supplement the school meals. Starting school food gardens, where the students can help cultivate crop such as vegetables (like tomatoes, carrots, *sukumawiki*, spinach, mushrooms) tubers like potatoes and rearing of animals like rabbits and chicken would increase micro nutrients and energy intake of the children. Again the school food gardens when used as demonstration plot for purposes of nutrition education for students to learn to grow food and rare animals at home would compliment school meals. The management should also ensure the orphans have an additional meal like breakfast or mid morning snacks.

5.3.2 Recommendations for policy

The Ministry of Education partners like WFP and others NGOs with interest in school going children need to enlarge the scope of school feeding programme in Kariobangi to include community participation. Kariobangi location which hosted the scope of

the study has 11 primary schools of which only three are on SFP while eight are not; this shows that there is a room for enlargement of SFP.

5.3.3 Suggestion for further study

A longitudinal study on the impact of school meals on school orphans in different settings is necessary to effectively measure the full impact of school feeding programmes on the nutrition and health status of orphans.

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APPENDIX I: Complementary Letter to the Respondents

Kenyatta University,
School of Environmental and Human Sciences
P. O. Box 43844,
Nairobi.

To Whom It May Concern

The bearer of this letter: _____

Registration Number: _____ Telephone: _____

The bearer of this is a Master of Science Degree Student, in Foods, Nutrition and Dietetics, at Kenyatta University School of Environmental and Human Sciences.

The student is required to submit, as part of the coursework assessment, a research project report on a given management problem. The university would like the students to do their projects on real problems affecting Kenya today. We would therefore appreciate if you assist the student collect data to this end. The results of the report will be used solely for purpose of the research and in no way will your school be implicated in the research findings. A copy of the report can be availed to the interviewed school(s) on request.

Yours respectfully,

The Coordinator,
Master of Science Programme,
School of Environmental and Human Sciences,
Kenyatta University

APPENDIX II: Letter of Authorization



**KENYATTA UNIVERSITY
GRADUATE SCHOOL**

P.O. Box 43844,
NAIROBI
Tel. No. 810901/9 Ext. 57530
E-mail: kubps@yahoo.com

18/3/05
received

Our Ref: H60/7773/02
Your Ref:

Date: 17th March, 2005

The Permanent Secretary,
Ministry of Education, Science & Technology,
P.O. Box 30040,
NAIROBI.

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION:

I write to introduce Ms. Caroline K. Arimi who is a Postgraduate Student of this University. She is registered for M.Sc. degree programme in the Department of Foods, Nutrition & Dietetics.

Ms. Arimi intends to conduct research for a project entitled, "Dietary Intake and Nutritional Status of Orphaned Children Participating and Those Not Participating in School Feeding programme in Kariobangi Location."

Any assistance given to her will be highly appreciated.

Yours faithfully,

P. K. MUCHEMI
FOR AG. DEAN, GRADUATE SCHOOL

C.C. Registrar (Academic)
Dean, GS - to see on file
Dean, School of Environmental & Human Sciences
✓Chairman, Department of Foods, Nutrition & Dietetics

PKM: eww

APPENDIX III: Map of Nairobi showing the location of Kariobangi

Source: (GOK/ KBS, 2008)

APPENDIX IV: Questionnaire for the Guardian/caregivers

Questionnaire No _____ Household number _____

Name of Respondent _____ Date of interview ____/____/2005

Relationship of Respondent to the Child _____

SECTION A: HOUSEHOLD DEMOGRAPHY

1. Starting with the head of the household, please tell me the number of people living in your household, their age, education, occupations, whether they earn any income, and their relationship to the household head.

Serial no.	Name	Sex 1=male 2=female	Age	Education	Occupation	Income earner (Tick if yes)	Relationship to HHH
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							

Key:

*Education: 1= None

2= Pre-Sch

3= Std 1-8

4= Form 1-4

6= College

7= Adult Literacy

**Occupation: 1= Civil Servant

2= Casual Laborer

4= Housewife

5= Business

6= Student

7=Unemployed

R/Ship to HHH

1. Head of HH
2. Parent of HH
3. Son
4. Daughter
5. Other

6. Grandchild
7. Wife
8. Relative other than above
9. Servant

Sex:

1 Male; 2 Female

2. What is the highest education level attained by the caregiver?

- i. Primary education
- ii. Secondary education

iii. Never went to school

3. What is the average income brought in and used in this household per month?

i. Less than 5,000 Ksh

ii. Between 5,000 – 10,000 Ksh

iii. Above 10,000 Ksh

iv. Other (Specify)

4. Please tell me the foodstuffs you have bought during the last one-week and how much you spent on each item

Name of foodstuff	Weekly expenditure	Name of food stuff	Weekly expenditure	Name of foodstuff	Weekly expenditure
1.		7.		13.	
2.		8.		14.	
3.		9.		15.	
4.		10.		16.	
5.		11.		17.	
6.		12.		18.	

5. Indicate the age category of the orphan under your care

5-6.99; 7-8.99; 9-9.99

6. What kind of an orphan is this child?

Mother dead

Father dead

Both dead

7. For how long has the index child stayed without one or both of the parents?

Mother _____ Years

Father _____ Years

8. Whom does the index child stay with?

i. Father

ii. Mother

iii. Guardian (specify)

9. What is the source of the food consumed in the house?

Bought ; Homegrown ; Donation

10. Has (mention the name of the child) been sick in the past two-weeks?

Yes ;No

11. If yes what disease was he/she having? (Ask to see hospital/ dispensary card if child attended health facility. Tick appropriately.

1= Cold/cough

5=Stomachache

2=Fever

6=Headache

3= Diarrhoea

7= Vomiting

4= Malaria 8= Others (Specify)

12. When the child gets sick, does she/he get any treatment?

Yes ; No

13. If yes, where does she/he go for treatment?

Doctor ; Parent/Guardian ; Other (Specify)

14. What precaution does the child take to avoid suffering from malaria?

Yes ; No

15. What does the child do immediately after visiting the toilet? _____

16. What are the most common illnesses experienced by the child and how frequently do they occur within one month? _____

Illness	Very often	Occasionally	Rarely	Other
Colds				
Coughs				
Fever				
Headache				
Stomachache				
Diarrhea				
Vomiting				
Malaria				
No appetite				

Skin problem				
Eye problem				
Ear problem				
Teeth problem				
Other (Specify)				

SECTION B: DIETARY PRACTICES

Participating in School Feeding Programme

1. How many times do you give food to the child per day

- i. Once
- ii. Twice
- iii. Thrice
- iv. Other (Specify)

2. What meals does the child take in school?

Breakfast ; Lunch ; Snack

Those Not Participating in School-Feeding Programme

3. How many times do you give food to the child per day?

- i. Once
- ii. Twice
- iii. Thrice
- iv. Other (Specify)

4. What meals does the child take in school?

Breakfast ; Lunch ; Snack

5. What meals does the child take at home?

Breakfast ; Lunch ; Snack

6. Are there usually any snacks taken by the child at home or on their way to or from school?

Yes ; No

7. If Yes, What kind of snacks do they carry?

- i. _____
- ii. _____
- iii. _____
- iv. _____
- v. _____

8. Are there times when the child goes without a meal?

Yes ; No

9. If yes, state which one?

Breakfast ; Lunch ; Supper ; Other

10. What is usually done to encourage the child to eat when he/she loses appetite for food?

- i. Give them small frequent meals
- ii. Give them the food of their choice
- iii. Do nothing and hence t
- iv. he child goes without the meal

v. Others (specify)

□

11. How many days, in the past seven days, did the child eat the specific food item?

Name of food item	Home	Freq/wk	school	Freq/wk
Main staple				
Chapati				
Rice,				
Ugali				
Maize				
Matoke				
Irish potatoes				
Sweetpotatoes				
Other				
Proteins				
Beans				
Peas				
Beans				
Beef				
Chicken				
Eggs				
Milk				
Other				

Vegetables				
Cabbage				
Sukuma wiki				
Carrots				
Tomatoes				
Peas				
Traditional vegetables				
Other (specify)				
Fruits				
Oranges,				
Avocado,				
Passion fruit				
Mango				
Pawpaw				
Pineapple				
Bananas				
Other				

APPENDIX V: 24-HOUR DIETARY RECALL (INTERVIEW SCHEDULE)

The guardian was asked the following questions and the responses filled

1. Starting from the morning to evening yesterday, please name all the food and drinks that the index child consumed.
2. What was the volume of each dish cooked?
3. What amount of each dish was served to the index child?
4. Were there any leftovers and if so what were the amounts?

3. Fill the tables

Name	
Sex	
Age*	
Date of birth	

*Age verification: 1. Child health card; 2. Birth certificate

Measurement	First	Second	Average
Weight (kg) 0.1kg			
Height (kg) 0.5 cm			

APPENDIX VI: Interview schedule for the teachers in charge of school feeding programme

Name of interviewer _____ Questionnaire No _____

Date of interview ____/____/2005 School _____

SECTION A: SCHOOL FEEDING PROGRAMME

1. Does the school have any school feeding programme?

Yes ; No

2. If yes, what are the objectives of the programme?

3. For how long has the feeding programme been in operation?

4. At what times are meals given to the students in school?

i. Breakfast Yes ; No

ii. Lunch Yes ; No

5. Which types of meals are given?

i. Breakfast

ii. Lunch

6. Who sponsors the school feeding programmes?

i. Breakfast

ii. Lunch

7. In your own opinion, do you think the school feeding program is successful in meeting its objectives?

8. For how long have you been in charge of the school-feeding programme?

9. What are the challenges being faced by the programme currently?

3. Fill the tables

Name	
Sex	
Age*	
Date of birth	

*Age verification: 1. Child health card; 2. Birth certificate

Measurement	First	Second	Average
Weight (kg) 0.1kg			
Height (kg) 0.5 cm			

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Yes ; No

2. If yes, what are the objectives of the programme?

3. For how long has the feeding programme been in operation?

4. At what times are meals given to the students in school?

i. Breakfast Yes ; No

ii. Lunch Yes ; No

5. Which types of meals are given?

i. Breakfast

ii. Lunch

6. Who sponsors the school feeding programmes?

i. Breakfast

ii. Lunch

7. In your own opinion, do you think the school feeding program is successful in meeting its objectives?

8. For how long have you been in charge of the school-feeding programme?

9. What are the challenges being faced by the programme currently?

APPENDIX IX: Food Composition Tables

Food Type	Energy (KJ)	Calories (Kcal)	Protein	Fat	Carbohydrate	Fiber
Maize Meal (Nrb)	1,562	372	9.86	4.37	72.55	1.25
Millet (Bulrush) (Nrb)	1,672	398	13.0	5.0	67.6	2.74
Rice (Nrb)	-	357	6.33	0.84	81.13	0.57
Beans	92	22	3.60	0.1	0.37	5.5
Chick Peas	1,499	356	19.6	3.7	63.5	6.7
Spinach (boiled)	71	17	3.32	0.45	1.47	2.45
Sweet Potato Leaves	189	45	4.6	0.55	5.35	-
Mango Ripe	252	60	0.6	0.2	15.0	0.9
Black Gram (Nrb)	-	349	24.1	0.6	61.9	4.1

Source: Sehmi, J. K. Dr (Mrs) (1993), National Food Composition Tables and the Planning of Satisfactory Diets in Kenya.

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