THE NUTRITIONAL STATUS OF PRE-SCHOOL CHILDREN AND SELECTED HOUSEHOLD FACTORS IN A NAIROBI SLUM, KENYA

BY

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

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DEDICATION

This thesis is dedicated to my parents Eustace Tatua Gitiche and Shelmith Wanjiru Tatua who both passed away in the course of writing up and who had always encouraged me, had faith in me, and invested so much in my education, and to the children of the world especially those of Africa who at times go to bed on an empty stomach.

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ABSTRACT

The main objective of this study was to provide information on the nutritional status of pre-school children aged 12-36 months living in Kibera slum. An investigation of the factors that affect their nutritional status was also carried out.

Information on socio-economic and demographic characteristics of mothers, child nutritional status, feeding habits of the children and nutritional knowledge of mothers was collected in a cross-sectional survey of 100 households with children aged in Kianda village in Kibera sub-location. The selection of the households was done through random sampling.

Frequencies, means and percentages were used to describe variables whereas chi-square and t-tests were used to test for statistical associations and differences between nutritional status of the pre-school children and socio-economic and demographic variables. Anthropometry was used to determine the nutritional status of the children.

The results showed that 27% of the children were underweight while 21% were stunted and only 6% were wasted.

Although it had been anticipated that there might be significant relationship between nutritional status and the various variables such as mother's education, nutritional

knowledge, feeding practices, maternal availability for child care, marital status, length of breastfeeding, no significant relationship was found.

Findings of the study indicated that monthly household income, complementary feeding practices and morbidity experience of the children were significantly related to their nutritional status.

This could imply that monthly household income, weaning practices and morbidity experience of the children are important when it comes to overall nutritional status.

In conclusion, an overhaul of the economic situation of the slum community and overall improvement of their living conditions would improve the nutritional status of the pre-school children.

TABLE OF CONTENTS

CHAPTER ONE INTRODUCTION

CHAPTER TWO LITERATURE REVIEW

CHAPTER THREE METHODOLOGY

CHAPTER FIVE DISCUSSION

CHAPTER SIX CONCLUSIONS AND RECOMMENDATIONS

LIST OF TABLES

LIST OF FIGURES

DEFINITIONS OF TERMS

Anthropometry: The science which deals with measurements of the variations of the physical dimensions and the gross composition of the human body at different age levels and degrees of nutrition (Jelliffee, 1966).

Malnutrition: An abnormal nutritional state of an individual or a community arising from either under-nutrition, over-nutrition, or specific nutrient deficiency and resulting in pathological changes (might be used in the same sense as protein energy malnutrition).

Protein Energy Malnutrition: A condition caused by a deficient intake of energy and proteins thus causing a child's growth failure (Cameron and Hofvander, 1983)

Stunting: Indicates deficiency in height for age. It is measured using set values in this case National center for health statistics reference values.

Wasting: A deficiency in weight for height and is an indicator of acute malnutrition.

Complementary feeding: This refers to the introduction of other food including drinks other than breast milk in the child's diet.

Income: This is the total monthly income from salaries, wages and other sources.

Morbidity: This is the experience of ill health.

Maternal availability for child care: This is the time the mother is able to spend with the child, cooking feeding and taking care of the child

Household: A group of people sleeping under the same roof and sharing food from the same pot on daily basis.

Household size: This is the number of people, adults and children living in a household.

Slum: A heavily populated area of the city having much poverty, poor housing, no piped water, roads or a sewerage system.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND INFORMATION

Nutrition is fundamental for development and growth of the human body from conception to adult life. It is essential to health and to the quality of life at every age. A normal healthy child grows at a genetically predetermined rate that can be compared or accelerated by undernutrition, imbalanced nutrient intake or overnutrition (Pipes, 1989). According to Cameron and Hofvander, (1983) nutritional diseases usually have multiple causes which include poverty, food habits, infection and lack of knowledge.

In the tropics there is much ill health among the children. In the pre-school age child, major diseases are Protein Energy Malnutrition (PEM) especially kwashiorkor, diarrhea, pneumonia, malaria, those due to intestinal worms and whooping cough. Frequently pre-school children suffer from several of these conditions at once. This can seriously affect growth and development (Jelliffe, 1985).

Poverty is pervasive in much of the third world. Ignorance of the special needs of children due to lack of nutritional knowledge and inappropriate cultural beliefs and practices often cause families to give children diets that are less in quantity and quality than those they can afford (Mosley and Chen, 1983). In some parts of Africa nutritional

deficiency diseases contribute from thirty to fifty percent of the deaths of children under five years of age.

In Kenya, the nutritional status of the rural population can sometimes be directly linked to the availability of and accessibility to good farmland. Chronic undernutrition especially protein calorie for example is a major problem in districts where food crop production is inadequate and variable for example thirty percent of children in Kitui district are stunted and 1.8% are wasted (unicef, 1989).

According to unicef (1989), a majority of the children in the tropics become undernourished during weaning or transitional period (i.e. from breast milk to other foods). Throughout the third world, there is intense urbanization. Demography shows that urban populations are increasing both due to natural population increase as well as migration (Austin, 1980). According to the United Nations in 1950, sixteen percent of the population of developing countries were city dwellers and by the year 2000 forty three percent will have inhabited urban areas. The largest relative percent growth rate among populations in cities was projected in Africa at 5%, but the actual growth in populations between 1970 and 1982 in the sub-Saharan Africa grew at over 6% a year (World Bank, 1986).

People moving to urban areas have to start a new way of life. The new way of life affects food habits and dietary pattern among other things and especially for those who live in shanty-towns of cities.

1.2 PROBLEM STATEMENT

There is need to establish the nutritional status of pre-school children especially the children that live in slums. These children are disadvantaged, as their parents are non-literate immigrants from rural areas who find it easier to settle in the slums.

Due to limitations associated with the parents educational status, they get problems when it comes to procuring employment, and therefore their capacity to purchase food is limited. They also have a tendency to adhere to their traditional food habits thus encountering problems when the foods they know are not available. Their children are therefore disadvantaged when it comes to quantity and quality of the food they receive.

Kenya's Development plan for 1979-1983 categorize this group and the pre-school children among others as some of the vulnerable groups who are likely to suffer from malnutrition.

There is also substantial research which has been done on the nutritional status of rural communities while very little information exists on the nutritional status of urban and pre-urban population. Also there is little information on children twelve to thirty six months who have started complementary feeding and receive meals wholly from home, as they have not started going to school where they could receive extra meals.

It is the nutritional status of these children that the researcher was interested in studying.

1.3 PURPOSE OF THE STUDY

Due to population increase from migration from rural areas to the slums of Nairobi, there is need to investigate the nutritional status of the children. The pre-school children are vulnerable to malnutrition among other diseases, therefore the need to determine their nutritional status in an urban slum and to identify the factors affecting it adversely.

1.4 SIGNIFICANCE OF THE STUDY

The main significance of this study is therefore to provide information on the nutritional status of the pre-school slum children.

The factors that influence it and also the problems that the mothers go through in an effort to feed their children are also investigated.

This information will be of use to the Ministries of Health, Economic Planning and Non-Governmental Organizations that are involved in improvement of human nutrition. They will be able to plan for more appropriate and well-targeted nutritional interventions. Projects with a limited budget aimed at improvement of the health of pre-school children can be more effective if the determinants of the nutritional status are known.

It is hoped that the study will give insights which will facilitate more precise identification of the health and nutritional needs of the pre-school children thereby contributing to designing of appropriate, better targeted interventions.

1.5 OBJECTIVES OF THE STUDY

The study had the following objectives:-

1. To determine the Socio-economic and demographic characteristics of the mothers of pre-school children living in a Nairobi slum
2. To determine the nutritional status of pre-school children in Kibera.
3. To investigate the food habits of the slum pre-school children.
4. To determine the relationship between nutritional status of pre-school children and the demographic, socio-economic characteristics of the mothers.
5. To describe the problems that mothers go through in their efforts to feed their children.

1.6 HYPOTHESIS

There is a relationship between the nutritional status of the children and demographic as well as social economic characteristics of the mothers

1.7 LIMITATIONS OF THE STUDY

Since the study was done in a slum area of Nairobi, generalization of the findings to the pre-school children of other areas in Nairobi or even in the rural areas should be done with care as the factors affecting their nutritional status may be different.

1.8 UNDERLYING ASSUMPTIONS

1. Mothers have had problems in acquiring nutritious foods to feed their children at one time or another.
2. The children under investigation (twelve to thirty six months) have started complementary feeding and have also not started schooling therefore their nutritional status will be determined wholly by what they eat at home.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

Five hundred million people world wide are chronically malnourished and it was estimated that thirteen million children below the age of five years died in 1990 due to diseases related to hunger and malnutrition (Food and Agriculture Organisation and World Health Organisation 1992). They estimated using the lowest level of caloric intake with which a person can maintain life and minimum activity. Of these forty thousand to fifty thousand, persons die each day as a result of malnutrition and overall 450 million to 1.3 billion people do not have enough to eat (Williams 1989).

In the developing countries malnutrition is prevalent as it is compounded by several factors such as poverty, ignorance, quality of food intake, socio-cultural values, inadequate maternal and child health care, inadequate national food security, wars and famines among others.

This review therefore considers the nutritional situation of pre-school children with emphasize on the factors that influence it.

2.2 THE GLOBAL NUTRITIONAL SITUATION

According to the Food and Agriculture Organisation (1988), twelve of the poorest countries have 342 million of the most undernourished people. A World Health Organisation (1988) world report indicates that nine South Asian countries, namely:

Bangladesh, Burma, Butan, India, Indonesia, the Maldives, Nepal, Srilanka and Thailand have made some progress in promoting better nutrition. But situations in other counties such as Afghanistan, Ethiopia, Somalia, Burundi and Rwanda have worsened due to war and drought.

Protein Energy Malnutrition is the most common deficiency in the world. About hundred million children are affected to a moderate or severe degree (Cameron and Holvander, 1983).

In general usage the term Protein Energy Malnutrition encompasses a spectrum of syndromes ranging from simple growth failure to pure and mixed syndromes of kwashiorkor, marasmus and marasmus-kwashiorkor.

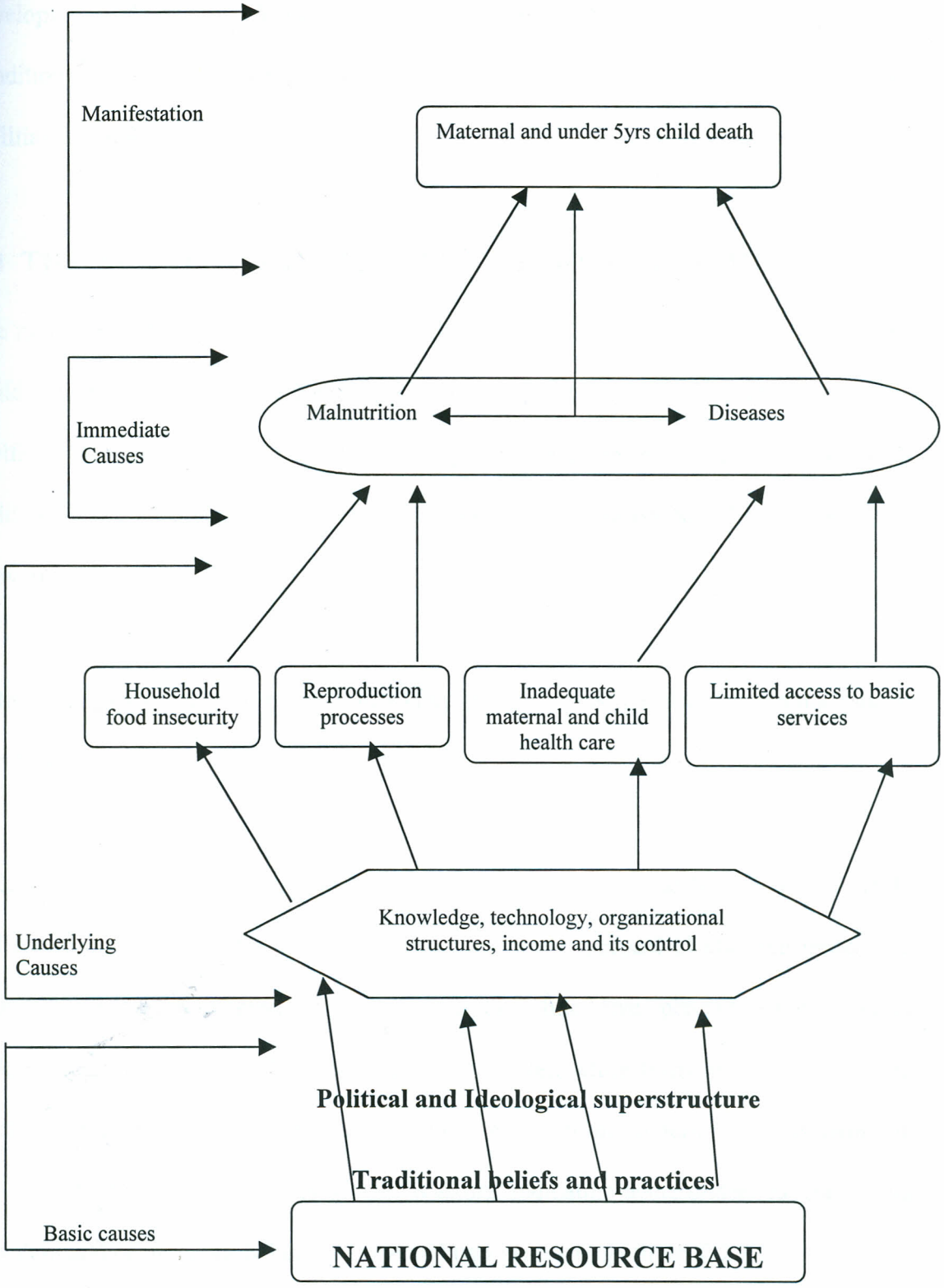
In (1981) World Health Organization estimated that of the one hundred million children and infants affected by malnutrition ten percent of them fall below sixty percent of the reference weight of their expected height which implies an acutely life threatening situation.

In some of the developing countries in Africa and Asia, four out of five young children have some form of Protein Energy Malnutrition. The majority of them become undernourished during the weaning period. A study carried out by unicef indicates that between 1990 and 1998, thirty two percent of children under five years in Sub-Sahara Africa were moderately underweight while ten percent were severely underweight. Nine

percent were wasted while forty one percent were stunted (Unicef, 2000). Malnourished children have a much higher death rate than children who are well nourished (Cameron and Hofvander, 1983).

Fig 1 shows the immediate causes of child deaths are malnutrition and disease. These result from a number of underlying causes, including low levels of dietary intake manifested in household food insecurity, birth spacing and timing, inadequate maternal and child health care resulting in morbidity and limited access to other basic services such as education water and sanitation. Affecting each of these four underlying causes are levels of knowledge and technology, systems of household and community organization and, not least of all, levels and control of income. Underlying causes, in turn are linked to a number of basic causes which contribute significantly to the situation of children and women. Basic causes are endogenous circumstances which evolve slowly, such as traditional beliefs and practices, the national resource base and the political and ideological superstructure (Unicef, 1992).

Fig.1. Causes of malnutrition and Death of children under five years in developing countries



Source: Unicef (1992) Children and women in Kenya. A situation Analysis.

Other than children and infants, pregnant women and the elderly are also at high risk of developing malnutrition. A large number of malnourished people live in high-risk conditions of poverty. These conditions influence, the health of all persons involved (Williams, 1988).

2.3 THE NUTRITIONAL SITUATION OF KENYAN CHILDREN

The main sources of information about child malnutrition in Kenya are the four Rural Child Nutrition Surveys carried out in 1977, 1978/79, 1982 and 1987 and the Household Welfare Monitoring and Evaluation Surveys. Information on Nutritional status of children in urban areas is limited to a few studies focusing on Nairobi and Mombasa (Government of Kenya/unicef, 1992).

With the high incidence of poverty in Kenya today, it must be true that malnutrition is also high.

Unicef carried out a study of children one to five years old on the Nations of the world and found out that between 1990 and 1998 twenty two percent of children under five years in Kenya were moderately underweight while five percent were severely underweight. Six percent of the children were wasted while thirty three percent were stunted. Stunting, a sign of frequent infections and chronic undernutrition is common with a peak at two to three years of age. Wasting, indicating acute undernutrition is less prevalent and occurs mainly between one and two years of age (unicef, 2000).

Blackhart (1979) studied two child populations under three at Kenyatta Estate and Mathare Valley in Nairobi. He found that only 6% of the children were underweight.

In 1979 Alnwick studied elite Kenyan children 3 to 7 years attending nursery schools in Nairobi. Weight, height and mid-upper arm circumference measurements were taken and comparison was done using the World Health Organisation International Reference Values. He concluded that growth of elite Nairobi children was very similar to that of WHO reference population.

Studies carried out in rural Machakos have shown that other than pregnant and lactating mothers, young children are the group most affected by marginal nutrition. Malnutrition in this group is due to both an inadequate diet and high morbidity rate. The studies associated high morbidity, high population densities with low levels of education. Poverty is associated with these factors and low socio-economic status is an important factor of malnutrition (Central Bureau of Statistics, 1987).

In the report of the child Nutrition Survey 1978-1979 Republic of Kenya, the prevalence of stunting was found to be thirty three percent in rural and twenty five percent in urban areas (Central Bureau of Statistics, 1982).

In the third rural child Nutrition Report of 1983, twenty four percent of the children fell below ninety percent of WHO reference standards for height-for-age. In terms of weight-for-age fifty four percent fell below eighty percent of WHO reference standards. Three

percent of the children were below eighty percent of the standard weight-for-height (Central Bureau of Statistics, 1983).

Njama (1988) examined 456 peri-urban children. He observed that twenty nine percent of the study children were below ninety percent of the height-for-age standard. Five percent were below eighty percent of the weight-for-height standard. A study carried out in Embu in 1987 showed that between eighteen and thirty months of age, the average Embu child weighed less than the lightest three percent of the American children in the WHO reference population. At thirty months of age, the average Embu child was considerably shorter and lighter than ninety percent of the children in the WHO reference population. Similar findings were made in Machakos.

Twenty eight percent of all children aged between one to four years in Kenya have a height much lower for their age than would be expected .A similar proportion of children have a low weight-for-age (unicef, 1984).

In rural Kenya, some areas have a higher prevalence of stunting than others. According to unicef (1984), the highest prevalence of stunting is found in Coast province, Kitui district, Nakuru district and districts bordering Lake Victoria. In Kitui district there are fluctuations in stunting levels ranging from thirty percent 1982 to twenty percent in 1987 and back to thirty percent in 1992. Similarly, stunting levels remain high in South Nyanza despite the extensive nutritional interventions of many donor agencies (unicef, 1992).

Provincial variation in nutritional status of Kenyan children is substantial. In Coast, Eastern and Western provinces, stunting is high (thirty five percent or more) and wasting is relatively low (less than five percent).

In Nairobi, Nyanza and Rift Valley provinces, wasting levels are high (seven percent) but stunting is low or intermediate in prevalence (Kenya Demographic and Health Survey, 1988).

2.4 FACTORS THAT AFFECT THE NUTRITIONAL STATUS OF CHILDREN

2.4.1 poverty /income

Approximately 155 million children or forty five percent of children under five in the developing countries live in absolute poverty. About 40 million of them live in urban areas and about 115 million in rural areas. Due to this poverty, these children get severe or mild Protein Energy Malnutrition, nutritional anaemia and loss of eyesight due to Vitamin A deficiency. Poverty and poor living conditions are most important underlying causes of Protein Energy Malnutrition (unicef, 1989).

Growth of cities in developing countries has seen increasing numbers of family's move to cities and towns. High prevalence of malnutrition are found in low income urban areas. The basic cause of these are poverty and poor environmental conditions. The situation is

aggravated when the mother has to work outside the home or when there is only one parent. Bottle feeding and high rates of infection are common in these households (Cameron and Hofvander, 1983).

Balderama (1973) compared the nutritional status of rural children and children of urban squatter families in greater Manilla using weight measurements in reference to lower standards and basing them on the Gomez classification, she found that rural children showed better nutritional status than the urban group. She also found out that children one to three years of age had the highest proportion with second degree malnutrition. Balderama (1973) attributes the high prevalence of malnutrition in the study area to adverse poverty and low or no income.

Pellet (1977) emphasized that marasmus among infants in their first year of life could only be eliminated through adequate income and reduction of poverty as well as housing and educating mothers.

A study comparing the prevalence of malnutrition in young children in Zana, Nigeria by Cherian (1984) showed that a significantly higher proportion of malnourished children came from rural backgrounds than from a newly urbanized area. The fathers of the urban children were predominantly employed skilled labourers.

A survey carried out by the India National Monitoring Bureau in 1984 and using the standard values of weight for age of Indian well to do children for categorizing the study

children into the different nutritional grades of Gomez found that the highest proportion of mild to moderate and severely malnourished children came from the poverty stricken slum residents (Unicef, 1985).

Studies have shown that as households income increases, more varieties of foods are taken (Amorozo, 1984). However, a rise in income does not necessarily mean a nutritionally improved diet (Bohdal, et al 1968).

Winikoff, et al (1984) and Okeahialan (1975) found socio economic status of the family as reflected by the total family income in both urban and rural areas to be an important factor contributing to poor child nutritional status.

Nutritional wasting as indicated by low weight/height has been found to occur during the second and third years of life, with the highest number of severe cases occurring during the second year. This has been attributed to poor complementary feeding practices which are also often associated with poverty and ignorance.

In Kenya poor members of the rural folks migrate to urban areas to form the poorest sections of the urban communities. These people are at a greater nutritional risk than their rural counterparts (Kogi, 1980).

2.4.2 food habits and availability

Food practices determine the food consumed by populations and the ultimate nutritional well being of individual (Sanjur, 1982). Beyond physical and economic determinants food habits are fundamentally cultural habits and ultimately determine what a person's dietary pattern will be. This in turn determines an individual's nutritional status. Food as a vehicle of nutrients has an astonishing range of meanings that may vary by socio cultural group, religion, sex, age, marital status and even population (Sanjur, 1982).

In developing countries the migrant coming to town is faced with many problems, the change from rural to urban environment and the new way of life such as finding employment and housing. The new urban environment affects food habits and dietary patterns. In contrast to the countryside, all foods have to be bought and the supply of local traditional commodities is often inadequate. This forces the migrant to adapt to new food habits (Cameron and Hofvander, 1983).

Protein Energy Malnutrition has been found to be precipitated by food habits. unicef (1989) in its survey of food habits in selected poor countries found that poor diet due to beliefs and attitudes increased the incidence of Protein Energy Malnutrition. Foods such as eggs, fish and meat were denied to young children due to certain beliefs. Jellifffe (1985) also found out that habits and beliefs were responsible for a variety of nutritious

foods being denied to young children. There was also an over emphasis of certain cultural super foods e.g. rice in Asia and bananas in parts of Uganda.

Malnutrition, undernutrition and over consumption throughout the world as well as accelerating urbanization and commercialism, are leading to imbalances in availability of products and knowledge about nutrition (Johnson, 1985). Growing urban populations are confronted with an increasing number of unfamiliar foods whose relative nutrition worth they are likely to be unaware. Also food availability in urban centers has been shown to pose no problems to the urban communities both in quantity and variety (Bohdal, et al, 1968). What seems to be the major constraint in obtaining adequate food supplies both in quality and quantity is the purchasing power, especially for the urban poor communities. Thus, the low purchasing power among the urban poor allows only a limited variety of foods to be bought resulting in a monotonous uninteresting and inadequate diet, that is unlikely to meet nutritional requirements.

Brace (1963) in a study of Caracass shantytown found that fresh meat, green vegetables and milk were not common in household meals due to unaffordable prices. Most foods resembled that of the countryside but people no longer ate chicken and fresh fruit as they used to.

2.4.3 morbidity

Repeated severe or chronic infections interfere with nutrition and hence with growth. Infections such as tuberculosis, whooping cough, diarrhoeal diseases, measles, malaria infestation with worms lead to decreased intake (failure of appetite, vomiting, restriction of food by parents) increased losses through diarrhoea, blood loss, poor absorption, raised temperature and increased needs of nutrients for optimum function (Jelliffe, 1985). Infections in turn increases the chances of acquiring Protein Energy Malnutrition.

An analysis was done of 35, 000 deaths of children under five years of age in Latin America. It was found that only a few diseases had caused most of the deaths. Protein Energy Malnutrition was the direct or indirect cause of deaths in fifty seven percent of these children (Cameron and Hofvander, 1983). Studies carried out in Costa Rica showed that incidents of diarrhoea were independent of weight-for-age in children less than thirty six months of age but in children thirty six to sixty months the attack rate was twice as much as in children with less than seventy five percent of the normal weight-for-age than those who weighed more. No associations were found between weight-for-age and the incidence of respiratory infections. In the low weight group there were deaths due to severe infection whereas in the satisfactory weight group no child died (Mosely and Chen, 1983).

Studies in Nigeria also associated the incidence of diarrhoea with wasting only. A survey carried out in 1974 revealed that the high incidence of infectious diseases and the

resultant morbidity and mortality among young children in most developing countries is largely due to lowered body resistance to infections because of malnutrition. A study in twelve Latin American countries revealed that over fifty percent of deaths in young children were due directly or indirectly to malnutrition, although this was seldom the explicit stated cause (Food and Agriculture Organisation/World Health Organisation, 1974).

A deterioration of nutritional status was reported from many countries and growing pressure of malnourished and undernourished patients on health services was taxing their personal and financial resources, especially when hospital treatment was required. Studies carried out by Jelliffe (1985) showed that death rate in pre-school children in the tropics is often at least twenty times as great as in Europe and North America. Also according to unicef (1990) the prevalence of infectious diseases is high in developing countries and especially in the tropics. Severely malnourished children are more than twice likely to die during an outbreak than better-nourished children.

2.4.4 birth order and household size

In rural Bangladesh Bhuiya (1986) found out that large households had negative effects on the nutritional status of children. Suggesting scarcity of resources availability, Kielmann (1976) using a stepwise discriminant analysis found a strong association between nutritional status of children, land ownership and payment of tax in an Indian rural community. Large family size and resulting maldistribution of food within the

family were major factors that could have been responsible for the overall low nutritional status in this Punjab community.

Birth order has also been found to have significant association with nutritional status of children. Cherian (1984) found that there was increased prevalence of malnutrition among children of higher birth order, birth order greater than four.

Ramprasand (1985) found that birth order had significant association with nutritional status of children in the thirteen to sixteen months age group only, while the same did not apply to the younger children. Among communities of low socio-economic status where there is state of diminishing economic resources, poverty is expected to increase as the number of children increase.

The Kenya Central Bureau of Statistics (1980) did not find significant association between birth order and nutritional status.

2.4.5 parental education and nutritional knowledge

The level of an individual's educational attainment is closely associated with worker productivity, family health/nutritional status, income, fertility rates, propensity to modernize and risk taking (Berly, 1989). There are some 900 million illiterate adults in developing countries, two thirds of whom are women (unicef, 1989).

Education of parents has been reported to have a significant association with nutritional status of children by researchers while others have found no significant association. Martorell, et al (1984) in their study of Nepal rural children found that increased parental education was associated with improved growth of children. Similarly, Aquillon (1984) found out that parents in urban areas had attained higher levels of education than rural parents and that there was a significant positive correlation between the educational attainment and the weights of the children in the study sample.

Bhuiya (1986) in rural Bangladesh ranked mothers education as having the most significant effect on the nutritional status of boys. The education of the father in the same study also had a positive impact on the nutritional status of girls. A survey done by unicef (1990) in selected areas of Namibia found that the more familiar a guardian was with positive health behaviour which was a result of more education, the more likely the child was to be less wasted. In the same report more education was highly significant and positively related to better nutrition in all occasions.

2.4.6. sex of child

A significant association between nutritional status and sex of children has been reported by researchers while others have reported the contrary. Kielmann (1976) found a clear correlation between sex and the nutritional status in his study population as a result of strong preference of a male child in the rural Punjab community in India. Similarly,

severe malnutrition was reported to be twice as common among girls than boys in Mahabad rural areas in India (Djazayery, 1983). Contrary to these findings the National Nutritional Monitoring Bureau of India (1984) reported that regardless of socio-economic difference girls in the study showed better body weight profiles than boys.

Socio-economic progress in course of time as indicated by the timing and environments in which these studies were carried out seem to be a possible answer to eliminating the sex bias in the rearing of children in communities where this bias exists (Kielmann, 1976).

The Kenya Central Bureau of Statistics (1977) originally also found that girls in all respects were nutritionally at greater risk than boys. In this study however, they did not consider the different potential growth patterns existing between boys and girls. By taking this into consideration during the 1978/79 Nutritional Survey no differences between the sexes were found. A survey done by unicef (1990) in selected areas in Namibia found that girls experience less stunting than boys. This was thought to be due to greater mobility of boys while looking after small animals from an earlier age.

2.4.7 marital status of mother/head of household

A survey done by unicef (1990) in Namibia found out that female headed households were poorer and more isolated than households headed by males. Stunting as an

indicator of long time deprivation was significantly worse in female headed households. These households also had more children who were wasted and undernourished.

The number of unmarried women is increasing in some countries and is as high as fifty percent in countries such as Botswana. There is also an increase in separated/divorced or widowed mothers (Jelliffe and Jelliffe, 1985). An increasing number of women are household heads, eighty percent in some parts of Latin America, forty percent in Panama, sixteen percent in Cuba and twenty percent in the USA. Similar estimates have been made for Africa. In Botswana in 1972, one-third of all households were headed by women. Data suggest that where women are household heads the incidence of malnutrition and infant mortality rates are higher. This can be associated with the fact that female household heads earn much less than men (Jelliffe, 1985).

In Chile twenty percent of female family heads fall in the lowest income bracket as compared to ten percent of male family heads. In Brazil, the percentages are forty one percent and twenty percent respectively (American Public Health Association, 1981).

In Kenya, women who head households are single, widowed or divorced. The majority of female headed households are to be found in the poorest parts of urban Kenya. The women who head these households tend to be employed in the informal sector. They work long hours and purchase food in the cheapest markets. The expensive foodstuffs e.g. Meat, fruits and sometimes milk are not bought. Since they have very few assets, they find it difficult to obtain even minimally suitable housing. As a result, their

homes are usually in the poorest neighbourhoods. In Nairobi for example, they are clustered in Mathare, Kibera, Korogocho, Kawangware, Pumwani and Eastleigh (unicef, 1992).

2.4.8 maternal availability for child care

In most parts of the world women traditionally work in the home, as well as contributing to the well being of their families through agriculture, manufacturing and trading. With modernization and urbanization more and more women are performing paid labour.

One of the special causes of kwashiorkor is when a mother does not breast-feed the child as is necessary (Jelliffe, 1985). Also decline of breast-feeding due to employement of mothers in the world is also accompanied by a high incidence of undernutrition in children (Ebrahim, 1983).

Marasmus is common in impoverished urban environment as mothers are normally away for most of the day trying to make a living. The child therefore has to be given bottle feeds. An additional danger in homes of the poor is that of infected feeds due to lack of hygiene when making bottle feeds. This causes infections and therefore Protein Energy Malnutrition (Jelliffee, 1985 and Ebrahim, 1985).

Haggertys (1981) study in Haiti found children of mothers who were not employed to have somewhat better growth during the first year but poorer growth during the second year.

CHAPTER THREE

METHODOLOGY

3.1 STUDY DESIGN

A cross-sectional survey, which allowed the respondents to be observed in their natural setting, was used to study the nutritional status of pre-school slum children and its relationship with other selected variables. In this study the mothers of the twelve to thirty six months old children in selected households were interviewed by the investigator.

This investigation serves both descriptive and analytical purposes. Therefore, its aim was to assess the nutritional status in relation to selected demographic and socio-economic variables.

3.2 LOCATION OF STUDY AREA

Kibera is located on the southwestern side of Nairobi. It is 6.4 kilometers from the city centre and is situated between Nairobi Dam, Kenyatta National Hospital, Woodley Estate and Jamhuri Park. There are eleven sub areas within Kibera. Some of them bear names closely associated with one or other tribal groups e.g. Kambi Muru, which is a Sudanese name, others are Makina, Laini Saba, Lindi, Silanga, Soweto, Gatuikira, Kianda, Kisumu Ndogo and Mashimoni. Lindi and Lomle are mainly Islamic areas and have their own mosques and Madrasa School.

Due to influx of upcountry folks seeking employment in the city, houses of lower quality ie. Mud houses are on the increase in Kibera. Kibera slums are inhabited mainly by people of low economic status such as watchmen, charcoal sellers, office messengers, labourers etc.

3.3 STUDY POPULATION

3.3.1 target population

This study's target population was pre-school children in the age group twelve to thirty six months and living in a Nairobi slum. This age group has been shown to be more vulnerable to malnutrition than any other group (Jelliffe, 1985).

The study assumed that the children had already started complementary feeding and, therefore, effects of malnutrition if any would be evident. They had also not started school where they might have been receiving extra meals, which in turn would have influenced their nutritional status. This meant that effects of socio-economic and demographic factors on nutritional status in their home setting of the children would be mostly portrayed.

3.3.2 sample selection

Kibera was divided into clusters based on the existing villages, namely; Mashimoni, Makina, Lindi, Kambi Muru,, Gattuikira, Soweto, Laini Saba, Kisumu Ndogo, Kianda and Siranga. Kianda was randomly selected from the clusters.

3.3.3 sample size

The sampling frame constituted a list of 342 households in Kinda excluding those, which did not have children twelve to thirty six months. These households were excluded so as not to bias the results. Using random sampling, a hundred households were selected and their twelve to thirty six months children and their mothers became the study sample. In households that had two children twelve to thirty six months, the child to be weighed and measured was randomly selected

3.4 DEVELOPMENT OF INSTRUMENTS

This study utilized two data collection tools, a maternal interview schedule and an anthropometric data

3.4.1 maternal interview schedule

The maternal interview schedule consisted of both closed and open-ended questions. This provided desirable combination of objectivity and depth and permitted gathering of valuable data. The items in the schedule were based on the objectives and purpose of the study. The intrument consisted of demographic and socio-economic information of the mothers, mother's opinions on various aspects of eating habits and feeding practices of the children, morbidity patterns as well as their nutritional knowledge.

3.4.2 children's anthropometric data form

Anthropometric data which included height, weight and age was collected from the children. These three variables were developed into indices of nutritional status.

This instrument was attached to the Interview Schedule. The interviewer filled in the anthropometric data of children after weighing and measuring their heights as well as verifying their ages by filling in date of birth. Sex of the child was also indicated.

3.4.3 pre-testing the instruments

Pre-testing the instrument involved ten respondents from a population very similar to the one used in the main study. They were drawn from Kianda village. They were excluded from the main study. Pre-testing the instrument enhanced clarity and flow of the items.

Communication problems from ambiguous questions were noted and questions corrected or rephrased.

Evidence of inadequate motivation e.g. from unwillingness of respondent to co-operate was noted. The interviewer was also able to evaluate the methods of recording interview data. Pre-testing also helped the investigator assess carefully the methods planned for quantifying and analyzing the data. The acceptability of the language to be used was also checked.

3.5 DATA COLLECTION PROCEDURES

The two data collection procedures ie. Interviews and anthropometry complimented each other. Anthropometric data helped establish the nutritional status of the children. It involved measurements of height, weight and establishment of age and sex.

The interviewer took all measurements throughout the study to eliminate inter-examiner errors. Data was then coded and all responses that were not numerical were allotted numbers.

3.5.1 weight for children 12-24 months of age

The weights were taken using a salter scale and recoded to the nearest 0.1 kg. A salter scale is a hanging scale with a stable teflonized spring, which is not affected by

temperature or frequent weighing. It has been widely used in different parts of the world. It is reliable for fieldwork study, easily transportable and relatively inexpensive, especially in relation to its durability compared with other scales (Burns, 1986). Use of salter scales has been emphasized in recent years by unicef which has produced an instruction booklet (Jelliffe and Jelliffe, 1989).

The scale was hang on a beam which was supported by the door of the house on one end by an assistant on the other. If there was a hook or nail in the house that could suspend the scale it was preferred.

The children were weighed in the morning, naked or in minimum clothing. When the scale was steady the reading was taken and recorded immediately. Two measurements were taken and the average of the two noted down. If they differed with more than 0.5 of a kilogram, the whole process was repeated.

3.5.2 weight for children 24-36 month of age

A bathroom weighing salter scale was used. The child stood on the centre of the platform with minimum clothing and without shoes and socks. Two readings were taken in the morning to avoid individual changes brought about by variation in quantities and volumes of different foods eaten during the day. Average of the two readings was recorded to the nearest 0.1kg.

3.5.3 height for children 12-24 months of age

These children were measured using a length board. Their recumbent length (Crown-heel length) was recorded to the nearest 0.5 cm. At this age measurement of standing height was either impossible or very inaccurate with an uncooperative child. The measurements were recorded twice so as to be as accurate as possible. The length board was made up of wood on which tape had been fitted on to the baseboard. Length boards are inexpensive, strong and light weight therefore suitable for fieldwork.

3.5.4 height for children 24-36 months of age

A height- meter was used. This was kept on a flat floor and a child stood against it with feet parallel to each other, knees straight and the heels, shoulders, buttocks, back of the head against the upright calibrated wood. With heels still on the floor, the headpiece was lowered until it touched the child's head and two readings taken to the nearest 0.5 cm and recorded immediately.

3.5.5. age of children

Mothers were asked to recall the date of birth of their children. The same was also confirmed from the child's clinic card. Age was then calculated from their birthday. The child had to be between twelve and thirty six months on the date of the interview.

3.6 DATA ANALYSIS

Data was processed using D Base III as the entry programme, anthro and statistical package for Social Scientists (SPSS) personal computer Programmes for respective generation of indices of nutritional status and analysis.

Data cleaning and editing was also done using the above programmes. The children were classified into categories of nutritional status using the National Centre for Health Statistics (NCHS) as reference data. This data allows classification of people into two types of malnutrition.

The cut off levels used were below minus 2 Standard Deviations (<-2 SD's) in all indices ie. Weight for height, height for age, and weight for age. The children who were below -2SDs were considered malnourished. The cut off point for wasting was set at below -2SDs of weight for height, which is an indicator of immediate nutrition history. This indicator was used to show the prevalence of acute malnutrition or nutritional wasting.

Stunting which is reflected by low height for age ie below -2SDs is an indicator of chronic undernutrition.

Weight for age reflects a combination of acute and chronic undernutrition. A child may have low weight for age either because he has grown at a reduced rate over a long period of time or has recently suffered from an episode of acute malnutrition. It does not distinguish between acute and chronic Protein Energy Malnutrition.

The children were classified as either malnourished or well nourished. A child at cut off levels of above -2SDs was considered to be of good nutritional health.

CHAPTER FOUR

RESULTS

4.1 INTRODUCTION

This chapter presents statistical analysis of data that were collected. Descriptive statistics mainly frequency tables, percentages and means were used. Further analysis using cross tabulations and t-tests was done. This chapter addresses different variables and their relationship with the nutritional status of pre-school children ages one to three years.

There is no single factor that fully determines the nutritional status of any vulnerable group of people therefore a number of factors have been looked at and their relationship with nutritional status established.

The study aimed at achieving certain objectives as follows.

1. To determine the Socio-economic and demographic characteristics of the mothers of pre-school children living in a Nairobi slum
2. To determine the nutritional status of pre-school children in Kibera.
3. To investigate the food habits of the slum pre-school children.
4. To determine the relationship between nutritional status of pre-school children and the demographic, socio-economic characteristics of the mothers.
5. To describe the problems that mothers go through in their efforts to feed their children.

4.2 FACTORS INFLUENCING THE NUTRITIONAL STATUS OF THE SLUM PRES-CHOOL CHILDREN

4.2.1 demographic and socio-economic characteristics of mothers

In this study, mothers were the respondents. Some selected demographic characteristics of the mothers are shown in table 4.1 (a). Their mean age was 23 years and this shows that the mothers in this study were generally young. Over a half had some primary school education and slightly above a third had gone up to secondary school. None had post-secondary education. Literacy level was high, as only a few were non-literate. Although it had been anticipated that there might be significant association between mothers educational level with nutritional status of the child the results demonstrated otherwise with a chi-square significance of P=0.2

Most of the mothers were married, a few were single and living with their parent/parents while one percent was widowed. None were separated or divorced.

Table 4.1 (a) shows that majority of the mothers were housewives while quarter were self employed and mainly involved in small business, such as, food vending on roadsides, or in kiosks, selling of second hand clothes, brewing chang'aa, tailoring and hair salons either in their houses or in kiosks. A few were employed as supportive staff. This included,; messengers, teagirls and cleaners. One percent was in the clerical/secretarial sector.

Table 4.1 (a) Distribution of the mothers by demographic and socio-economic characteristics

Characteristics	Percentage
I Educational level of mother	
Not literate	4
Some primary education	61
Some secondary education	35
Total	100
II. Marital status	
Married	89
Single	10
Windowed	1
Separated/Divorced	0
Total	100
III. Occupation	
Clerical/Secretarial	1
Supportive	4
Self employed	22
Housewife	73
Total	100

4.2.2. income

The study established that apart from wives and husbands, the other adults in household had come to the city to look for work or had come to live with family as dependants. Just over a third of the husbands were casual laborers. Over a quarter of the husbands were in the supportive group which included messengers, cleaners, office tea boys, sweepers etc.

About a tenth were in the higher cadre of clerical work and fourteen percent were self-employed.

Table 4.2 (a) shows that over a half of the households got their income from salaries. A little over a quarter of the households relied on wages. While about a tenth relied on salaries and wages. In these households, either the husband or wife were employed and the other engaged in some income generating activity/ies.

About a tenth of the households had an income of less than Ksh. 1000 per month while a quarter had a monthly income of between Ksh. 1000 and 2000 per month.

Close to two thirds of the households had a monthly income of Ksh. 3000 and above.

Table 4.2 (a) Household income and sources

Characteristics		Percentage
I.	**Source of income**	
	Salaries	60
	Wages	29
	Wages + Salaries	11
	Total	100
II.	**Household income per month**	
	0-1000	11
	1001-2000	25
	2001-3000	20
	3000-4000	18
	4001-5000	9
	5000 and above	17
	Total	100

4.2.3 household size and composition

The mean household size was five persons. This shows that the households were fairly large. Household size has an implication on food supply and therefore on the nutritional status of the household members. Only close to a tenth of the households were female headed while a majority were male headed.

4.2.4 maternal availability for child care

This was measured by determining whether the mother was available to be with the child so as to cook for or feed him/her. Table 4.3(a) shows that nearly all of the mothers cooked for their children whereas only a minority had their children being cooked for by a relative. Ninety seven percent of the mothers also fed their children while only a few were fed by relatives.

None of the mothers had employed a helper. Mothers nutritional knowledge in the slums is presumed to be important as majority of the mothers spend most of their time with their children as the above figures show.

When away from home, slightly above a third of the mothers left their children with neighbours, and just below a quarter took the children with them while over a third left them with an older sibling or other relatives, but would be back in the evening in time to cook and feed their children.

Table 4.3 (a) Maternal availability for child care

Characteristic		Percentage
I.	**Who cooks for the child**	
	Mother	97
	Relative	3
	Total	100
II.	**Who feeds child**	
	Mother	97
	Relative	3
	Total	100
III.	**Person left with the child when Mother is away**	
	Neighbours	37
	Mother takes child	23
	Relative/older siblings	40
	Total	100

4.2.5 household food habits and practices

In the households investigated all the members ate the same type of food and although there was no special food for the pre-school children, snacks were only given to the pre-scholars in some households. It was found out that close to three quarters of the households served ugali and vegetables for lunch and supper for at least five days out of seven. A tenth served ugali, meat and vegetables five days of the week in all two main meals.

A slightly less than a tenth of the households served ugali and meat without vegetables five days a week for the two main meals. Rice with stew and chapati with stew were

served by only a few of the households. Stew comprised of potatoes, cabbage and sometimes carrots. Very few households served githeri (i.e. maize and beans boiled together) in five days out of seven. Table 4.4 (a)

Table 4.4 (a) Distribution of households by frequency of foods served to members in the last seven days, lunch and supper

Food	Ugali/ Vegetables	Ugali/meat vegetables	Ugali/ meat	Rice/stew	Chapati/ Stew	Githeri i.e (maize and beans
Rarely Served %	30	89	91	93	99	98
Served most Of the weak %	70	11	9	7	1	2
Total	100	100	100	100	100	100

4.2.6 food availability

As shown in table 4.5(a) nearly all of the households bought their food while only one percent of the households grew most of their own food. All the foods needed by households were easily accessible to all households; the problem to acquiring it was the money. Less than a tenth did not always have easy access to the required food due to finances.

Table 4.5(a) Food availability and accessibility

Variable		Percentage
I.	**How family food is acquired**	
	Brought	99
	Grown	1
	Total	100
II.	**Accessibility of food**	
	Always	94
	Not always	6
	Total	100

4.2.7 nutritional knowledge of mothers

Mothers were classified as most knowledgeable, knowledgeable and not knowledgeable. This was based on questions of functions of certain common foods in the bodies of their children. Each food represented a particular food group.

Those who scored 50% and below on the main function of the three food groups were classified as not knowledgeable, those who scored between 50% - 75% were knowledgeable and those who scored 75% and above were most knowledgeable. Table 4.6(a) shows that over half of the mothers were not aware of the basic food function in

their children's body, a little less than a fifth were knowledgeable and another less than fifth were categorized as most knowledgeable because they knew most of the basic nutritional functions of foods.

Table 4.6 (a) Nutritional Knowledge of Mothers

Variable	**Percentage**
Function of various food groups In childs body	
Not knowledgeable	64
Knowledgeable	18
Most Knowledgeable	18
Total	100

4.2.8 length of breastfeeding

Mothers were asked how long they expected to breastfeed the child if they had not already stopped, and if they had stopped, for how long they had done it. It was found out that close to three-quarters of the mothers' breastfed their child for a reasonable length of time ie. twelve to twenty four months. A little over a fifth breastfed their child up to the age of twelve months whereas less than a tenth breastfed through the second year.

Reasons given for stopping breastfeeding early (ie. Between 0-12 months) was that the mother did not have enough milk or that there was another baby on the way or born while the older one was still young.

Table 4.6(b) Length of breastfeeding

Variable	Percentage
Length of breastfeeding child	
0-12 months	22
12-24 months	73
24-36 months	5
Total	100

4.2.9 commencement of complementary feeding

The results show that about a fifth of the mothers started complementary feeding at the ages of zero to three months. Close to three quarters started at ages three to six months while a few started after six months. During this transition period, breastfeeding was still going on.

In this study majority of the mothers started complementary feeding between ages three to six months. Complementary feeding was found to be associated with the nutritional status of the children. There was also a significant difference between the means to confirm this.

4.2.10 foods used for complementary feeding

Mothers were asked to name the first foods they used to feed their children. All of them used more than one type of food with the popular ones being porridge, bananas, cowmilk fruits and potatoes.

Porridge was made from sorghum, millet or maize flour.

About one fifth of the mothers used porridge, fruit or milk as baby's food. Fruits included pawpaws, avacado and ripe bananas. Slightly less than a fifth used potatoes as complementary food while above a tenth used green bananas. The rest included ugali and soup from the family foods

Table 4.6 (c) complementary feeding

Variable		Frequency	Percentage
I.	**Commencement of complementary feeding**		
	0-3 months	23	23
	3-6 months	70	70
	above 6 months	7	7
	Total	100	100
II	**Foods used for complementary feeding**		
	Porridge	77	20.2
	Fruits	75	19.6
	Cow milk	80	20.9
	Green bananas	58	15.2
	Potatoes	69	18.1
	Ugali	17	4.4
	Soups	6	1.6
	Total	382	100

4.2.11 morbidity experience

In this study more than half of the children reported to have been ill in the last seven days The most common illness was diarrhea with about two fifths of the children having had it within the last seven days. Close to a third had also suffered from sever colds and coughs. Above a tenth had suffered from malaria and only a few had experienced vomiting. When children were sick close to a half of the mothers took them to a hospital or dispensary. About two- thirds bought and administered medicines themselves. A few mothers consulted a health worker or a local medicineman or did nothing. For the sake of interest the researcher went round the kiosks to find out what medicines were being sold and found out that all of them had stocks of malaria drugs, pain killers, fever and cold drugs. A few shops also had some antibiotics usually penicillin.

During an illness episode, only a few mothers modified the child's diet by trying to increase the consumption of foods and fluids. Some foods were decreased or denied completely. These were foods such as milk, meat, fish and fruits. The reasons given were varied but the most common were, the consumption of these foods would make the disease worse, or the foods were too cold especially fruits, or caused stomach upsets. Majority of the mothers did not change the feeding patterns during the illness episode. Table 4.7 (a)

Table 4.7 (a) Morbidity experience of child in the last seven days action taken and its effect on feeding pattern of child

Variable		Frequency	Percentage
I.	**Has child suffered any illness in The last seven days**		
	Yes	60	60
	No	40	40
	Total	100	100
II.	**Name of illness**		
	Diarrhea	26	43.3
	Flu/cold/cough	22	36.7
	Vomit	3	5.0
	Malaria	9	15.0
	Total	60	100
III.	**Action Taken**		
	Bought medicine	25	41.7
	Took child to dispensary/hospital	29	48.3
	Consulted health worker	1	1.7
	Consulted medicineman	1	1.7
	Did nothing	4	6.6
	Total	60	100
IV.	**Were certain foods increased During illness**		
	Yes	9	15
	No	51	85
	Total	60	100
V.	**Were certain foods decreased During illness**		
	Yes	6	10.0
	No	54	90
Total		60	100

4.3 FOOD HABITS OF PRE-SCHOOL CHILDREN

4.3.1 number of meals

The number of meals given to a child are important to his or her health. Giving small meals several times a day promotes better health than a few large meals. This is because the bulky nature of food in the context of a child's small stomach is not digested and utilized well when it is ingested in big spaced quantities unlike when the meals are small and frequent.

In this study most mothers had given their pre-scholar five meals in the last 24 hours. These included breakfast, snack, lunch, afternoon snack and supper. Most snacks consisted of porridge made from maize or sorghum flour with or without milk. Only about a tenth of the mothers had given their children four meals in the last 24 hrs. i.e breakfast, lunch, snack, supper. The rest had given their children three main meals. Table 4.8 (a) shows that a majority of the mothers followed some feeding schedule while slightly above a quarter fed their child on demand. Only a few left the child to feed itself. Almost all mothers fed their children on their own plates and therefore the children fed well without feeling threatened that the food would be finished by other household members. Also children were served first in three quarters of the households. In a little over tenth of the households fathers were served first and in close to a tenth of the households, members were all served at the same time.

Table 4.8 (a) Household meal patterns for children

Variable		Frequency
I.	**Number of main meals in Last 24 hours**	
	5 meals	84
	4 meals	8
	3 meals	8
	Total	100
II.	**Ques for when to feed child**	
	When child asks	27
	Food available at any time for Child to feed	3
	Follow feeding schedule	70
	Total	100
II.	**Serving method used**	
	Same plate with others	5
	Child served on own plate	95
	Total	100
III.	**Food service priority**	
	Children first	75
	Father first	14
	All served together	11
	Total	100

4.3.2 types of snacks

Snacks given to children supplement the main meals and thus are important for the health of the children. The snacks given to children were mostly porridge with or without milk, tea with or without bread, ripe bananas and milk (Table 4.8b)

In nearly a tenth of the households, no snacks were given. Porridge was the most popular snack with a third giving it to their children at one time or another.

Table 4.8 (b) Snacks provided to pre-schoolers

Type of Snack	Frequency	Percentage
Porridge from millet/ sorghum without milk	34	19
Porridge from millet/sorghum with milk	32	17.9
Porridge from maize flour with milk	11	6.2
Porridge from maize flour without milk	5	2.8
Tea with bread	28	15.6
Tea alone	21	11.7
Milk	20	11.2
Ripe bananas	28	15.6
Total	179	100

4.3.3 food denied children

It was found that less than a fifth of the children were denied certain foods. A majority were given all types of foods depending on availability. Most of the food not given were apparently nutritious and included fish, eggs, milk and meat. When asked why they withheld these foods, the reasons varied from fear of sickness to taboos.

See Table 4.8(c)

Table 4.8 (c) Foods denied child

Variable		Frequency	Percentage
I.	**Are there food not given to a child**		
	Yes	16	16
	No	84	84
	Total	100	100
II.	**Type of food not given to a child**		
	Nile perch	6	37.5
	Eggs	8	50.0
	Milk	1	6.25
	Meat	1	6.25
	Total	16	100
III.	**Reasons for denying child food**		
	Body rashes	6	37.5
	Diarrhoea	4	25.0
	Stomach upset	1	6.25
	Taboos	5	31.25
	Total	16	100

4.3.4 breastfeeding and complementary feeding

Althought three quarters of the mothers breastfed their child into the second year only less than a tenth continued into the third year. A majority of the mothers had also

commenced complementary feeding between three and six months. Porridge, fruits, cow milk and green bananas were the most popular foods used for weaning the children.

4.4. PROBLEMS THAT MOTHERS GO THROUGH IN AN EFFORT TO FEED THEIR CHILDREN

4.4.1 income

Household expenditure on food depended on the monthly income of the household. The income had to be divided between buying of food, paying rent as a majority had rented houses (rooms), paying school fees, health care, buying clothes and water. About a third of the mothers said they spent 500 shillings per month on food whereas two fifths spent between Ksh. 500 and 1000 on food. A quarter spent over Ksh. 1000 on food alone. See Table 4.9 (a)

Table 4.9 (a) Distribution of households by expenditure on food

Expenditure Ksh	Percentage
0-500	33
500-1000	40
Over 1000	27
Total	100

Most of the mothers when asked whether this amount was enough for food lamented that it was not. They wished they had more money to feed their families well.

4.4.2 maternal availability for child care

The fact that a majority of the mothers were housewives or self employed made it easier for them to be able to spend time with their children. Maternal availability for childcare was therefore not a problem as nearly all the mothers were able to cook for and feed their children. When the mothers were away they took their children with them or left them with a neighbour or older sibling/s. They were however back in good time to cook for and feed their children.

4.4.3 food availability

Almost all the mothers bought their food from kiosks and markets. Only a minority grew most of their food. A majority said that food was always easily available from the shops and markets. The problem was the money to buy this food. Most of the mothers wished they had a shamba to grow food to supplement what they were buying.

4.5 NUTRITIONAL STATUS OF PRE-SCHOOL CHILDREN.

One of the objectives of this study was to establish the nutritional status of the pre-school children. The National Centre of Health Statistics (NCHS) was used as the reference standard, using the cut-off point recommended by WHO (1983). The study children who fell below minus two standard deviations (< - 2Sds) of weight-for-age, weight-for-height and height-for-age were considered unhealthy while equal or above minus two standard deviations (≥ 2ds) were considered as well nourished.

Forty eight percent of the pre-school children were boys whereas fifty two percent were girls.

4.10 (a) Distribution of children by weight-for height

Weight / height SD	Percentage
Equal/Above -2SD (normal)	94
Below -2SD (wasted)	6
Total	100

Table 4.10 (b) Distribution of children by weight -for-age

Weight /Age SD	Percentage
Equal/Above -2SD (normal)	73
Below -2SD (wasted)	27
Total	100

Table 4.10 (c) Distribution of children by height-for-age

Height / Age SD	Percentage
Above -2SD (normal)	79
Below -2SD (stunted)	21
Total	100

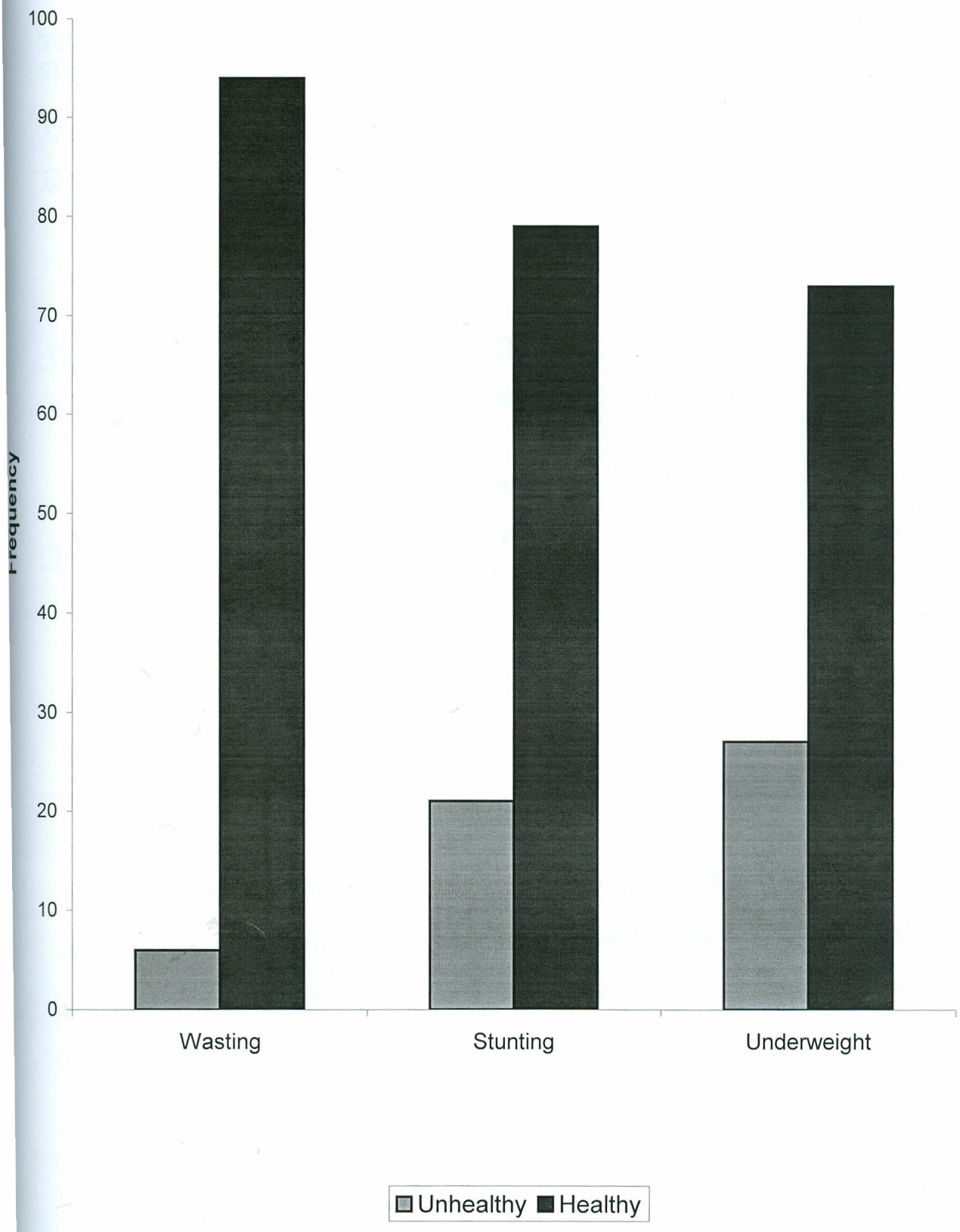
Table 4.10 (a) shows that the prevalence for wasting was 6%. Wasting was, therefore, common in the pre-school children. Weight for height is a good indicator of the extent of acute malnutrition.

As shown in table 4.10 (b) when the indicator weight-for-age was used 27% of the children were under weight while 73% were healthy.

Weight-for-age is not independent of weight-for-height or height-for-age. It is rather a combination of the two. A low weight-for-age could be due to reduced growth over a long period or due to a recent episode of malnutrition.

The prevalence for stunting was 21% as shown in table 4.10(c). Stunting is the measurement of linear growth. It occurs mainly on children living in chronic deficits of energy supplies. Deficits in height take time to develop. Typically, a child in a bad environment will fail to grow as well as his well-nourished peers in both weight and height. Height-for-age is therefore an indicator of long term Nutritional Status of the child.

Fig.2: Nutritional Status of Pre-school children



4.5.1 sex of children and nutritional status

Table 4.10(d) Distribution of children by sex and by weight/age S D, weight/height SD, and height/age SD (Nutritional status)

Variable	Health Status	Males		Females	
		Frequency	%	Frequency	%
Weight/Age SD	Equal/Above -2SD's (Normal)	35	72.9	38	73.1
	Below -2SD's (Underweight)	13	27.1	14	26.9
Total		48	100	52	100
Weight/Height SD	Equal/Above 2SD's (Normal)	44	91.7	50	96.2
	Below -2SD's (wasted)	4	8.3	2	3.8
Total		48	100	52	100
Height/Age SD	Equal/Above -2SD's (Normal)	35	72.9	44	84.6
	Below -2SD's (Stunted)	13	27.1	8	15.4
Total		48	100	52	100

Table 4.10(d) shows that when distribution of children by sex and by Nutritional Status was examined, a higher proportion of boys were found to be wasted. Similarly, a higher proportion of boys was also found to be stunted, whereas there was not much difference between the sexes, when it came to being underweight or malnourished.

4.5.2 birth order and nutritional status

Table 4.10 (e) Distribution of children by birth order and by weight/height

Rank	Health Status			
	Equal/Above -2SD's (Normal)		Below -2SD's (Wasted)	
	Frequency	Percentage	Frequency	Percentage
1	36	38.2	3	50.0
2	24	25.3	-	-
3	15	15.6	2	33.3
4	13	13.8	1	16.7
5	3	3.1	-	-
6	2	2.0	-	-
7	2	2.0	-	-
Total	94	100	6	100

Table 4.10(e) show that a half of the first borns were wasted. About a third of the third borns were also wasted whereas close to a fifth of the fourth borns were wasted. This could be due to the fact that the more children a mother got, attention on the older children was now shifted to the younger children therefore a higher percentage of wasting for the older children.

Table 4.10(f) Distribution of children by birth order and by weight/age

Rank	Health Status			
	Equal/Above -2SD's (Normal)		Below -2SD's (Malnourished)	
	Frequency	Percentage	Frequency	Percentage
1	27	39.6	12	44.5
2	18	24.7	6	22.2
3	13	17.8	4	14.8
4	10	13.7	4	14.8
5	3	4.1	-	-
6	1	1.4	-	-
7	1	1.4	1	3.7
Total	73	100	27	100

Table 4.10(f) show that more first borns were malnourished more than any other rank with 44% of the children being unhealthy. A fifth of the second borns were also malnourished. In rank three and four some children were also malnourished. A small percentage of the last borns were malnourished as well.

Table 4.10 (g) Distribution of children by Birth order and by Height/Age

Rank	Health Status			
	Equal/Above -2SD's (Normal)		Below -2SD's (Stunted)	
	Frequency	Percentage	Frequency	Percentage
1	27	34.2	12	57.1
2	21	26.5	3	14.3
3	14	17.7	3	14.3
4	12	15.2	2	9.5
5	3	3.8	-	-
6	1	1.3	-	-
7	1	1.3	1	4.8
Total	79	100	21	100

Table 4.10 (g) show that more than a half of the first borns were stunted. Slightly above a tenth of the second and third borns were stunted whereas a tenth of the fourth borns were unhealthy as well as a few of the last borns.

4.6 DIFFERENCES AND ASSOCIATIONS OF SELECTED FACTORS WITH THE NUTRITIONAL STATUS OF THE PRE-SCHOOL CHILDREN.

The main objective of this study was to establish the factors that affect the nutritional status of the pre-school child. This was done by analyzing demographic and socio-economic variables that were anticipated to have statistical significance with the nutritional status of the pre-school child using chi-square and t- tests so as to establish their relationship.

These variables included marital status of mother, monthly household income, morbidity experience of the child for the last seven days. Nutritional knowledge of mothers among others.

Table 4.11(a) Distribution of children by household income in Ksh per month and by weight for age

Income Category	Underweight		Healthy		Total	
	N	%	N	%	N	%
0-2500	11	(11%)	16	(16%)	27	(27%)
2500-5000	9	(9%)	30	(30%)	39	(39%)
5000-7500	7	(7%)	27	(21%)	34	(34%)
Total	27	(27%)	73	(73%)	100	(100%)

$X^2 = 3.6$

$df = 2$

$P = 0.043$

Table 4.11 (b) Distribution of children by household income in Kshs per month and by height for age

Income Category	Stunted		Healthy		Total	
	N	%	N	%	N	%
0-2500	6	(6%)	21	(21%)	27	(27%)
2500-5000	9	(9%)	30	(30%)	39	(39%)
5000-7500	6	(6%)	28	(28%)	34	(34%)
Total	21	(21%)	79	(79%)	100	(100%)

$X^2 = 4.11$

df = 2

P = 0.036

Table 4.11(c) Distribution of children by illness in the last seven days and by weight for age

Illness	Underweight		Healthy		Total	
	N	%	N	%	N	%
Illness	28	(28%)	32	(32%)	60	(60%)
Not ill	10	(10%)	30	(30%)	40	(40%)
Total	38	(38%)	62	(62%)	100	(100%)

$X^2 = 4.78$

df = 1

P = 0.028

Table 4.11 (d) Distribution of children by complementary feeding age and by weight for age

Complementary Feeding age	Underweight N	%	Healthy N	%	Total N	%
≤ 4 Months	9	(9%)	22	(22%)	31	(31%)
≥ 5 Months	18	(18%)	51	(51%)	69	(69%)
Total	27	(27%)	73	(73%)	100	(100%)

$X^2 = 3.87$
df = 1
P = 0.01

Table 4.11(e) Distribution of children by complementary feeding age and by height for age

Complementary feeding Age	Stunted N	%	Health N	%	Total N	%
≤ 4 Months	7	(7%)	23	(23%)	30	(30%)
≥ 5 Months	14	(14%)	56	(56%)	70	(70%)
Total	21	(21%)	79	(79%)	100	(100%)

$X^2 = 11.52$
df = 1
p = 0.001

Although, it had been anticipated that there might be some association between nutritional status and most demographic and socio economic variables, only a few variables showed statistical significance. This meant that the nutritional status of the children was dependent on only a few of the variables.

These were household monthly income Table 4.11(a) and 4.11(b). Monthly income was significantly associated with weight–for-age and height-for-age at P = 0.043 and P = 0.036 respectively. Morbidity experience of the child was also significantly associated with weight-for-age at P = 0.028 but not with the other two nutritional status indicators namely weight-for-height and height-for-age. See table 4.11(c).

Table 4.11(d) shows that complementary feeding age was found to be associated with weight-for-age of child at P = 0.01, whereas there was a strong association between complementary feeding and height-for-age at P = 0.001 see Table 4.11(e).

Table 4.11(f) Distribution of children by nutritional knowledge of mothers and by height for age

Nutritional knowledge	**Stunted**		**Healthy**		**Total**	
	N	**%**	**N**	**%**	**N**	**%**
Not Knowledgeable	14	(14%)	46	(46%)	60	(60%)
Knowledgeable	6	(6%)	14	(14%)	20	(20%)
Most Knowledgeable	6	(6%)	14	(14%)	20	(20%)
Total	26	(26%)	74	(74%)	100	(100%)

$X^2 = 0.417$
df = 2
P = 0.81

Table 4.11(g) Distribution of children by nutritional knowledge of mothers and by weight for age

Nutritional knowledge	Stunted		Healthy		Total	
	N	%	N	%	N	%
Not Knowledgeable	24	(24%)	40	(40%)	64	(64%)
Knowledgeable	7	(7%)	11	11%)	18	(18%)
Most Knowledgeable	7	(7%)	11	(11%)	18	(18%)
Total	38	(38%)	62	(62%)	100	(100%)

$X^2 = 0.018$
df = 2
P = 0.9

Table 4.11(h) Distribution of children by length of breastfeeding and by height for age

Length of breastfeeding	Stunted		Healthy		Total	
	N	%	N	%	N	%
0-18 Months	21	(21%)	45	(45%)	66	(66%)
19-36 Months	5	(5%)	29	(29%)	34	(34%)
Total	26	(26%)	74	(74%)	100	(100%)

$X^2 = 3.41$
df = 1
P = 0.06

Table 4.11(i) Distribution of children by length of breastfeeding and by weight for age

Length of breastfeeding	Underweight		Healthy		Total	
	N	%	N	%	N	%
0-18 Months	26	(26%)	40	(40%)	66	(66%)
19-36 Months	12	(12%)	22	(22%)	34	(34%)
Total	38	(38%)	62	(62%)	100	(100%)

$X^2 = 0.16$
df = 1
P = 0.6

Table 4.11 (j) Distribution of children by educational level of mothers and by weight for age

Educational Level	Underweight		Healthy		Total	
	N	%	N	%	N	%
Primary Level	26	(26%)	38	(38%)	64	(64%)
Above primary level	12	(12%)	24	(24%)	36	(36%)
Total	38	(38%)	62	(62%)	100	(100%)

$X^2 = 0.51$

df = 1

P = 0.47

Nutritional knowledge of a mother was expected to be strongly associated with the nutritional status of the pre-school child but it was not the case with P = 0.81 for Height-

for-age. See Table 4.11(f). Similarly, no statistically significant association was found between nutritional knowledge and weight-for-age see Table 4.11(g).

Length of breastfeeding was also not associated with nutritional status of child even though majority of the mothers breastfed their children into the second year. However, Table 4.11(h) show that association between breastfeeding and Height-for-age was marginal at $P = 0.06$. There was no significant association between breastfeeding and weight-for-age at $P = 0.6$ see Table 4.11(i). Educational level of mother was categorized in terms of the level of education reached namely, primary education and above primary education. It was expected that the more educated a mother was the better nutritional status of the child as education makes a mother more aware of the nutritive value of foods. However, there was no association between mothers education and nutritional status of child. See Table 4.11(j). In the same way, marital status of mother, food habits of children and sex of child were not significantly associated with nutritional status of the pre-school child.

Table 4.12(a) Differences between Nutritional Status and selected variables and by weight for Age (t- tests)

Variable		n	mean	sd	t	p
I	Household income per month Ksh					
	0-4000	80	0.92	1.28		
	4000-8000	20	0.94	1.3	.21	0.03
II	Marital status of mother					
	Single	11	1.12	1.3		
	Married	89	1.48	1.41	.77	0.44
III	Mothers level of education					
	Primary	65	1.98	1.74		
	Post primary	35	1.41	1.39	.79	0.43
IV	Nutritional knowledge					
	Knowledgeable	64	1.40	1.47		
	Most knowledgeable	36	1.49	1.28	.33	0.74
V	Length of breastfeeding					
	0-18 months	66	1.50	1.33		
	19-36 months	34	1.30	1.52	.66	0.52
VI	Morbidity experience					
	Ill	60	1.56	1.32		
	Not ill	40	1.25	1.50	1.09	0.27
VII	Complementary feeding age					
	≤ 4 months	70	0.86	1.19		
	≥ 4 months	30	0.89	1.2	1.1	0.02
VIII	Sex of child					
	Male	48	1.70	1.41		
	Female	52	1.21	1.36	1.73	0.08

Table 4.12(b) Differences between nutritional status and selected variables and by weight for height (t-tests)

Variable		n	mean	sd	t	p
I	Household income per month Ksh					
	0-4000	80	0.43	1.48		
	4000-8000	20	0.43	1.43	.01	0.001
II	Marital status of mother					
	Single	11	0.74	1.01		
	Married	89	0.93	1.50	.39	0.600
III	Mothers level of education					
	Primary	65	1.07	1.72		
	Post primary	35	0.89	1.45	.24	0.813
IV	Nutritional knowledge					
	Knowledgeable	64	0.90	1.49		
	Most knowledgeable	36	0.88	1.41	0.6	0.953
V	Length of breastfeeding					
	0-18 months	66	0.87	1.39		
	19-36 months	34	0.95	1.60	.25	0.805
VI	Morbidity experience					
	Ill	60	1.01	1.49		
	Not ill	40	0.72	1.40	.99	0.323
VII	Complementary feeding age					
	≤ 4 months	70	0.91	1.26		
	≥ 4 months	30	0.89	1.28	1.02	0.03
VIII	Sex of child					
	Male	48	0.99	1.68		
	Female	52	0.82	1.25	.59	0.50

Table 4.12 (c) Differences between nutritional status and selected variables and by height for age (t - tests)

Variable		n	mean	sd	t	p
I	Household income per month Ksh					
	0-4000	80	1.13	1.22		
	4000-8000	20	1.13	1.05	.61	0.04
II	Marital status of mother					
	Single	11	0.73	1.47		
	Married	89	1.22	1.46	1.0	0.319
III	Mothers level of education					
	Primary	65	2.22	1.16		
	Post primary	35	1.12	1.45	1.48	0.142
IV	Nutritional knowledge					
	Knowledgeable	64	1.13	1.56		
	Most knowledgeable	36	1.25	1.26	.40	0.693
V	Length of breastfeeding					
	0-18 months	66	1.35	1.43		
	19-36 months	34	0.83	1.45	1.70	0.092
VI	Morbidity experience					
	Ill	60	1.23	1.50		
	Not ill	40	1.08	1.40	.48	0.631
VII	Complementary feeding age					
	≤ 4 months	70	0.86	1.19		
	≥ 4 months	30	0.89	1.2	.52	0.02
VIII	Sex of child					
	Male	48	1.49	1.46		
	Female	52	0.90	1.40	2.03	0.45

Significance of various variables with Nutritional status was tested using t-tests. Just like in associations between Nutritional Status and the variables, not many as expected had a significant difference between the group means.

In all the Nutritional Status indices namely weight for age, weight for height and height for age, monthly household income showed a significant difference between the group means at P=0.03 for weight/age, P=0.001 for weight/height and P=0.04 for height/age. See Tables 4.12a-c. There was also a significant difference between the group means for complementary feeding and weight/age at P= 0.02 Table 4.12(a) weight/height at P=0.03 Table 4.12(b) and Height/Age at P = 0.02 Table 4.12(c).

Similarly, sex of child also had a significant difference for height/age at P=0.04 see table 4.12 (c).

However, in all the other variables namely nutritional knowledge of mother, length of breastfeeding, marital status and educational level of mother, morbidity experience, and food habits of child, there was no significant difference between the group means with P> 0.05. See Tables 4.12 a-c

CHAPTER FIVE

DISCUSSION

5.1 NUTRITIONAL STATUS OF THE CHILDREN

5.1.1 weight-for- height

In the children, food energy intake goes to fuel physiological functions as well as growth. Any imbalance is taken from or added to, the body stores of energy stores in form of fat, as protein (in muscle) and for short term use as carbohydrate (in the liver and muscle). These stores can be measured as weight. The energy stores are therefore labeled "weight-for-height".

Thinness/fatness as weight-for-height measure body energy stores and indicates the energy intake/expenditure balance. Negative balance in children means that their health and development is affected.

A child's weight-for-height is an indicator of nutritional wasting and primarily reflects severe short term deprivation of food in its immediate nutritional history, for example during episodes of disease such as diarrhoea or times of food shortage.

In Kenya nutritional wasting or acute malnutrition affects only a small proportion of the child population (C.B.S, 1984).

The level of wasting in Kenya has not changed much since the 1993 Kenya Demographic and Health Survey (KDHS, 1998).

Six percent of children under five in Kenya are wasted. One percent are severely wasted i.e. below - 3SD. Wasting is most common during ages 6-23 months, indicating food supplementation during complementary feeding (weaning) period is inadequate (KDHS, 1998).

In this study six percent of the children were wasted. This figure was higher than the national average of three percent (CBS, 1982), and similar to the national average of six percent (KDHS, 1998).

Other studies in the slums of Nairobi have reported a lower rate of wasting. A study by Maina (1988) reported that 4.9 percent of the children in Korogocho were wasted whereas another study by Waihenya (1994) in Kibera reported a rate of 1.9 percent.

Njama (1988) reported a rate of wasting of 3 percent when he examined pre-school children in peri-urban Nairobi, whereas Blackhart (1979) found out that 6% of the children in Mathare Valley and Kenyatta Estate of Nairobi were wasted. It, therefore, appears that over the years there has not been sustainable improvement in nutritional status of the pre-school children to keep nutritional wasting in check.

5.1.2 height-for-age

A child's weight-for-age is an indicator of its long-term nutritional status. Children with low height-for-age are said to be stunted and they may have suffered from long term or chronic undernutrition.

This condition is usually associated with long-term factors such as poverty, frequent infections and poor feeding practices (Unicef, 1992).

In this study the proportion of stunted children was 21 percent. This was slightly higher than the national average of 19.6 percent (CBS, 1987). A study carried out in the slum of Kawangware by Unicef (1992) showed a level of stunting of 21.6 percent. This was more or less similar to the findings in this study.

Other studies done in the slums showed a much higher proportion of stunting. A survey done by Maina (1988) in Korogocho showed that 27 percent of the pre-school children were stunted whereas another one done in the Makina slum of Kibera showed a level of stunting of 86.2 percent (Waihenya, 1994).

The high prevalence of stunting could perhaps mean deteriorating standards of living in the urban slums population.

5.1.3 weight-for-age

A child's weight-for-age reflects both previous growth and present nutritional conditions. It is widely used in Kenya for monitoring the growth of individual children (CBS, 1993).

Over one fifth (22%) of children under five in Kenya are underweight. Peak levels of low weight for age occur during the second and third years (12-36 months) (KDHS, 1998).

In this study, 27 percent of the children were underweight. This figure is much higher than the national urban average of 13 percent (CBS, 1993).

Maina (1998) found out that 36.2% of the children in the slum area of Korogocho had a low weight-for-age which is also much higher than the national urban average. More than half (58%) of pre-school children in a Kibera slum were also found to be malnourished (Waihenya, 1994).

The deteriorating standards of living causing increase in food prices and unemployment could perhaps be attributed to the high prevalence of undernutrition.

5.2 FACTORS THAT AFFECT THE NUTRITIONAL STATUS OF PRE-SCHOOL CHILDREN

5.2.1 mothers education

Nearly all the mothers had attained some education with only four percent being non-literate. Over a half had some primary education ie. They had finished primary school education while close to a third had gone up to Secondary school. Despite a third of the

mothers having gone up to secondary level only four percent were in the formal employment as teagirls, messengers and cleaners in offices. Only one percent was in the secretarial sector. Education of the mother has been associated with improved Nutritional Status of children. Similarly, more education is usually associated with increased income earning capacity which in turn may improve the socio-economic status of the family. However, increase in socio-economic status alone does not always improve nutritional status of the children (Pellet, 1977).

This is supported by the study since high proportions of healthy children hand mothers with above primary education yet education was not statistically significantly related to the Nutritional Status of children.

5.2.2 marital status

Majority of the mothers of the study households were married. Though marital status of the mother was not statistically associated with the Nutritional Status of the children, more than half of the healthy children were found in households where both parents were present. It would be expected that children under the care of both parents would have the lowest risk of malnutrition.

5.2.3 monthly household income

Household monthly income was the single most variable, which was statistically associated with the nutritional status of the children. In this, study more than half of the

households had a monthly income of above Kshs. 3000. Only a little over a tenth were earning an income of less than Kshs. 1000 per month.

Similarly, household income also showed a significant difference between the group means in all the Nutritional Status indices. Higher proportions of healthy children were found in households with higher income. More than half of the healthy children were in households with a monthly income of above Kshs. 2000.

Socio-Economic status has been found to be associated with Nutritional Status by many researchers (Kielmann et al 1976, Aquillon et al 1983, Cherian et al, 1984). The findings of this study are similar to the findings of these researchers. Mothers were mostly self employed and were running small scale businesses which included selling of second hand clothing, tailoring, hair salons or food vending. One can therefore argue that increasing the income of this population would improve the nutritional status of the children and the rest of the family members. Since it was significantly associated with all the Nutritional Status indices in this study.

5.2.4 household size and composition

The mean household size was five persons. These findings were similar to those of other studies carried out in slum areas of Nairobi. Maina (1988) found out that households in Korogocho had an average of 5 persons while Kogi (1980) found an average of 4.4 members in a household in a Nairobi slum.

Nearly all of the households were male headed while close to a tenth were female headed. There was no association between household size and the nutritional status. These findings were contrary to findings of other researchers such as (UNICEF 1992, Kielmann et al, 1976, Jellifee et al, 1985) that household size is related to nutritional status of the children under five years of age.

5.2.5 food habits and practices of the children

The type of food served in households determines whether the members are getting all the nutrients or not. From the findings of this study, it appears that diets of the study population are mainly from plant sources with low caloric density. A variety of animal proteins and calories would have to be given to the children so as to meet their daily requirement. However, in some households, whatever was missing in the main meals was supplemented by the snacks.

The cheapest food is not necessarily the worst in nutrients, so long as the mother has some nutritional knowledge. The problem is that the carbohydrates are usually the cheapest and bulkiest, hence children were served large servings of ugali with very little vegetables.

Even though, almost a third of the children were undernourished due to financial constraints, its not possible for this population to afford animal proteins. Nearly three quarters of the households had had ugali and sukuma wiki (kale) for five days in a week for the main meals.

The frequency of the meals for the children was good with most of them having five meals per day.

The number of meals given to a child are very important to his or her health. Giving small meals several times a day promotes better growth than a few large meals. This is because the bulky nature of food in context of a child's small stomach is not digested and utilized well when its ingested in big spaced quantities unlike when the meals are small and frequent.

More detailed quantitative study on the diet and nutrients would, however, be required to come up with detailed findings that could be reliably used to make conclusions on the nutrient intake of the population.

Food for this population was easily available and majority of the mothers knew that a child should be fed frequently however, the quality and quantity of food given to a child is very important. Despite these two factors, nearly a third of the children were undernourished. This finding may be explained by the low purchasing power amongst the study families.

Mothers were asked whether there were some foods that they did not give their children and less than a fifth withheld some types of foods. Most of the withheld foods were apparently very nutritious for a growing child. They included meat, nile perch, milk and eggs.

The reasons given for withholding the foods included:- the fear that the child would diarrhoea, get body rashes, stomach upsets, or that there were prohibitions based on religion or taboos. This contributes to poor diets given to the children. However, there was no significant relationship between Nutritional Status and the components of food habits and practices.

5.2.6 nutritional knowledge of mothers

To find out how much the mothers knew about the foods they gave their children, they were shown a list of different common foods.

The three basic food groups were represented. They were asked to state how each food helped their children/child once eaten.

Close to a fifth of the mothers knew how to classify most of the foods into the three food groups achieving a score of 75 percent and above and were classified as most knowledgeable. Almost a fifth also had a score of between 75 percent and 50 percent and were classified as knowledgeable while close to two thirds of the mothers scored 50 percent and below. These were classified as not knowledgeable.

The nutritional knowledge of mothers was not significant to the nutritional status of the children. Similar findings were reported by Waihenya (1994) in a study carried out in one of the Nairobi slums.

Almost half of the healthy children belonged to mothers with least nutritional knowledge, when the association of height-for-age and nutritional knowledge was analyzed.

Similarly, nearly a half of the healthy children belonged to the least knowledgeable mothers when the association between nutritional knowledge and weight-for-height was analyzed. It could be argued that these mothers were better off financially than the rest as income was one single factor found to influence nutritional status of the children.

The usefulness of teaching the three food groups is currently being questioned and the emphasis now is on frequency of feeding the children. This would be of help to mothers who are not able to classify foods into the basic food groups as they would comfortably feed their children with what they have.

5.2.7 breastfeeding and complementary feeding

Breast-feeding the human child has overwhelming advantages anywhere in the world but especially in the developing countries where hygiene is poor and resources are not sufficient to purchase feeding supplements. Exclusive breastfeeding for the first four to six months of an infant's life generally enhances its nutritional levels, although the early introduction of supplements may undermine any benefits gained (Unicef, 1992).

In this study, majority of the mothers breastfed their children into the second year of life. Only less than a tenth continued into the third year. The long period of breastfeeding by

these mothers could be due to the fact that most of the mothers were housewives and were therefore at home with the children most of the time.

The average duration of breastfeeders was higher in 1982 at 18.2 months (CBS, 1982), while it had dropped to 16 months in 1992 (Unicef, 1992). The study mothers were good breastfeeders as majority went beyond the national average duration. There was no significant relationship between duration of breastfeeding and child nutritional status.

Complementary feeding which is the introduction of other foods other than breastmilk to the child, should be indicated by need rather than by imposed arbitrary timing so long as the child continues to gain on breastmilk alone. A child can be sustained properly by breastmilk for up to 4 months. Children in the tropics become undernourished during this transitional period (unicef, 1989).

Age at which a child starts eating other foods other than breastmilk is very critical to the health of a child. Early introduction before the age of three months is detrimental to the health of the baby because the baby is not able to digest starch and there is high risk of infection due to contaminated food.

A child should be given foods with all the nutrients that the rapidly growing body needs. Small frequent meals are thus recommended (Jelliffe, 1985).

In the study the complementary foods used by mothers were cow milk, porridge, fruits, starchy foods such as green bananas and potatoes.

Mothers who started complementary feeding their babies before the age of three months felt that their milk was not adequate for their children and associated the baby's cry with hunger. Almost three quarters of the mothers introduced other foods to their children between the ages of three to six months.

Complementary feeding was found to be significantly associated with the nutritional status of the children. This finding is not new but a further confirmation of similar findings by other researchers. This reflects the need for emphasis by health workers and nutritionists to the mothers on the importance of proper introduction of other foods other than breastmilk.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 conclusions

The aim of this study was to investigate factors that affect the Nutritional Status of pre-school children from a poor population in a Nairobi slum. The study also aimed at describing the Socio-economic and demographic characteristics of mothers as well as looking at the food habits of their children. The children's Nutritional Status was also assessed.

1. Household income was associated with wasting and stunting and this leads to the conclusion that the temporary or casual nature of employment is likely to expose children to wasting while stunting is reflective of the impact of chronic low household incomes.

2. Despite the results showing the majority of the mothers had inadequate nutritional knowledge, the study leads to the conclusion that nutritional knowledge, in the context of a non-economic enabling environment does not offer a child adequate protection against malnutrition

3. Although morbidity has an implication on nutritional status, the possibility of withholding foods during sickness is a dimension, which has to be put into context when addressing morbidity issues.

4. Diarrhoea, fever/cough, and malaria are the top three maladies, which affect children in this slum. These are conditions which can be substantially reduced through appropriate house based interventions.

6.2 recommendations

1. There is need to establish intervention strategies which aim at increasing level of household incomes among slum dwellers. Income generating projects for women should be encouraged and starting capital provided in form of loans. The progress of the projects should then be closely monitored, advice given and basic skills of the mothers assessed where necessary. Focus should mainly be on women as they are more family oriented and therefore use the income to improve the living standards of their families.
2. Morbidity status of the children was found to affect their nutritional status. Therefore, improvement of the overall living conditions is necessary so as to improve the health standards of this community. Withholding of food during sickness as an issue should be addressed and mothers taught to feed their children more frequently with smaller meals.

6.3 further research

1 There should be a pilot study to try out an intervention on economic empowerment of women and the impact on nutritional status of their children.

2 More detailed quantitative diet evaluation at the household and individual level would be required to come up with findings that could be reliably used to make conclusive statements on the food habits of the slum pre-school children.

3 There is need for a detailed quantitative and qualitative survey on factors that affect nutritional status. The study should involve a larger sample so as to generate more conclusive data.

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APPENDICES

INTERVIEW GUIDE

SECTION I. MOTHERS DEMOGRAPHIC CHARACTERISTICS

Date:_____:/ _____:/ _____:/ _____: /_____:/

1. Household Number: _____:_____:_____

2. Name of respondent_____

3. What is your age in Years_____

4. What is your educational level?

   1= Not Literate (read and write)

   2= Adult Education

   3= Some Primary Education

   4= Some secondary Education

   5= Post Secondary Education

   6= Others

5. What is your marital status?

   1= Married

   2= Single

3= Separated

4= Divorced

5= Widowed

6. What is your occupation?

1= Clerical/Secretarial

2= Supportive

3= Self employed

4= Housewife

5= Others

7. What is your husband's occupation?

1= Clerical

2= Supportive

3= Self employed

4= Manual labourer

5= Others

9= N/A

8. What are your sources of income

1= Salaries

2= Wages

3= Other

9. What is your household income per month?_____

9b. How much of this do you spend on food per month? _____

SECTION II HOUSEHOLD SIZE AND COMPOSITION

Enter details of household members.

10 11.	12.	13.	
Name	Sex 1=Male 2=Female	Relationship to Mother 1=Husband 2=Daughter/son /in law 3=Mother/Father/ In law 4=Brother /Sister in law 5= Grandchild 6= Others	Age in Years

SECTION III: MATERNAL AVAILABILITY FOR CHILD CARE

14. Who cooks for your children/child?

Mother=1

Others=2

_____

15. Who feeds your children?

Mother=1

Others

_____

16. Whom do you leave your child with when you are away?

1= Older sibling / relative

2= Neighbour ayah/ others

SECTION IV: FOOD HABITS AND PRACTICES

17. What meals have you given your child within the last 24 hours?

_____

1 = Breakfast

2 = Snack

3 = Lunch

4 = Snack

5 = Supper

17b. What type of snack do you normally give your child? _____

18. Which method do you use to feed your child? _____

1 = When child asks for food

2 = Leave food for child to feed him/her self/others

3 = Follow feeding schedule

4= Others

19. Do you serve your child who is now 1-3 years in the same plate with others?

Yes = 1

No = 2

20. Whom do you serve first in your family? _____

1 = Children

2 = Father

3 = Mother

4 = All served at the same time

21. Which food have you served most in the last seven days? _____

1 = Maize, beans/peas

2 = Potatoes

3 = Ugali/vegetables

4 = Ugali/Vegetables/meat

5 = Ugali/meat

6 = Rice/stew

7 = Chapati/stew

8 = Others

22. Are there foods that you don't give your child who is now 1-3 years?

Yes = 1

No = 2

22b. If yes, name the food and reason for not giving it to the child

Food	Reason

SECTION V: FOOD AVAILABILITY

23. How do you acquire the food you use to feed your family?

1 = Bought

2 = Grown

3 = Gift

4 = Bought/Grown

5 = Gift/Grown

6 = Bought/Gift/Grown

7 = Others

24. Is the food you want easily accessible?

1 = Sometimes

2 = Not always

3 = Always

4 = Others

SECTION VI: NUTRITIONAL KNOWLDEGE/MORBIDITY EXPERIENCE

25 a. Foods children eat have three main functions in their bodies.

b. They give a child energy

c. Help a child grow

d. Protects a child from diseases

25b. Do you think of the nutrients that your child is getting from the food that you give? _____

Yes =1

No = 2

25c. If no,

why? _____

What is the function of the following foods in a child's body?

FOOD	FUNCTION		
Foods such as milk, eggs, beans	0	1	2
Foods such as spinach, sukuma wiki, cabbage	0	1	2
Foods such as ugali, bread, potatoes	0	1	2
Foods such as oranges, pawpaws, mangoes	0	1	2

0 = Do not know

1 = Wrong answer

2 = Right answer

26. For how long did your breastfeed your child who is now 1-3 years?

_____

27. What foods did you use for complementary feeding?

_____

_____

_____

_____

28. At what age did the baby start complementary feeding?

_____

29. Has your child suffered from any persistent illness in the last 7 days? _____

1= Yes

2= No

29b. If yes, name the problem _____

29c. What action did you take? _____

1 = Bought medicine

2 = Took child to dispensary/hospital

3 = Consulted health worker

4 = Consulted traditional medicineman

5 = Others

9 = N/A

30. What foods did you increase or decrease during this period?

a. Increase _____ b. Decrease _____

_____ _____

_____ _____

SECTION VII: CHILD NUTRTIONAL STATUS

31. Name of Child	
32. Sex of child 1 = male 2 = female	
33. What is the rank of the child in the family? _____	
34. Date of Birth	_____/ _____/ _____/
35. Ist height of child in centimeters	_____/ _____/ _____/ _____/
2nd height of child in centimeters	_____/ _____/ _____/ _____/
Average height	_____/ _____/ _____/ _____/
36. 1st weight of child in kilograms	_____/ _____/ _____/ _____/
2nd weight of child in kilograms	_____/ _____/ _____/ _____/
Average weight	