

**FACTORS AFFECTING FOOD SELECTION, INTAKE  
AND NUTRITIONAL STATUS OF THE ELDERLY  
IN MATHARE SLUMS OF NAIROBI KENYA**

BY

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

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DEDICATION

This work is dedicated to my precious husband **Jackson Mobisa Mogeni**.

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**To God be the Glory and Honour.**

## ABSTRACT

This study was conducted to investigate factors that affect food selection, intake and the nutritional status of the elderly in Mathare slums of Nairobi Kenya. The major objectives for this study were: to determine the nutritional status of the elderly in Mathare slums; to determine the food preferences, satisfaction/dissatisfaction with foods available in the market for the elderly in Mathare slums; to determine factors that influence food selection among the elderly in Mathare slums; to investigate the nutritional knowledge of the elderly in Mathare slums, and to establish the dietary intake of the elderly in Mathare slums.

Data were collected using an interview schedule administered on a sample of 90 elderly people, aged 55 years and above and living in Mathare slums, between April and June, 2001. Anthropometric measurements, such as height, weight, armspan and MUAC were taken. A food frequency questionnaire was administered to assess the dietary intake of the respondents. Data were analyzed using the statistical package for social sciences (SPSS) for frequencies and percentages. Anthropometric data were analyzed using BMI cut-off point of 18.5kg/m<sup>2</sup> for underweight and MUAC cut-off points of 22cm for women and 23cm for men.

The study composed of 57 (63%) men and 33 (37%) women. The most represented age group was 55-59 years. Most respondents were married and had at least some primary education. Forty one percent of the respondents had 4-6 dependants on their income.

The elderly did not score well on the items on nutritional knowledge and therefore can be said not to be nutritionally knowledgeable. The physiological factors that affected their food selection and intake were dental problems, loss of taste and appetite and chronic diseases and 90% of them reported loss of weight. The psychological factors that affected food choices were loneliness and bereavement.

The socio-economic factors that had most influence on the respondents' choices were income, cost of food, place where the food was bought, the cooking facilities available and the means of transport to the market place. Eighty seven percent of elderly were satisfied with the foods available in the market for their use though they expressed a need for some specific modifications like reduction of prices, providing variety and improving the standards of hygiene. Thirty eight percent of respondents ate vegetables and cereals because of lack of money.

The nutritional status of the elderly in Mathare was generally fair though 31% were underweight using BMI whereas 21% were malnourished using MUAC standards.

Using a food frequency questionnaire, the dietary intake of the elderly in Mathare can be said to be high in cereals, low in animal foods and medium in vegetables and fruits.

## TABLE OF CONTENTS

DECLARATION .....	ii
DEDICATION .....	iii
ACKNOWLEDGEMENT .....	iv
ABSTRACT .....	v
TABLE OF CONTENTS .....	vii
LIST OF TABLES .....	XII
LIST OF ACRONYMS .....	xiii
CHAPTER ONE .....	1
INTRODUCTION AND BACKGROUND INFORMATION .....	1
1.0 Introduction .....	1
1.1 Statement of the Problem .....	5
1.2 Purpose of the Study .....	6
1.3 Specific Objectives .....	7
1.4 Limitations .....	7
1.5 Assumptions .....	7
1.6 Significance of the Study .....	7
1.7 Description of Variables .....	8
1.7.1 Independent Variables .....	8
1.7.2 Dependent Variables .....	8
1.8 Definitions of Terms .....	9
1.9 Conceptual Framework .....	9

CHAPTER TWO.....	11
LITERATURE REVIEW.....	11
2.0 Introduction.....	11
2.1 Aging.....	11
2.1.1 The Aging Process.....	12
2.1.2 The Elderly.....	12
2.1.3 Attitudes About Aging.....	13
2.2 Nutritional Status of the Elderly.....	13
2.3 Effects of the Aging Process on the Nutritional Status of Elderly Persons ....	15
2.4 Factors Affecting Food Choice and the Nutritional Status of the Elderly ....	15
2.4.1 Factors Affecting Metabolism and Physiology.....	16
2.4.2 Factors that Determine Food Intake.....	16
2.5 Assessment of Nutritional Status.....	21
2.5.1 Clinical Assessment.....	21
2.5.2 Anthropometric Assessment.....	22
2.5.2.1 Weight.....	23
2.5.2.2 Height.....	23
2.5.3 Dietary Assessment.....	25
2.6 Factors Influencing Food Habits/Intake.....	25
2.7 Summary of Related Studies done in Kenya.....	26
CHAPTER THREE.....	28
METHODOLOGY.....	28
3.0 Introduction.....	28
3.1 Research Design.....	28

3.2	Description of the Study Area.....	28
3.3	Target Population.....	29
3.4	Sampling Procedures and Sample Size .....	29
3.5	Data Collection, Instruments and Procedures .....	30
3.6	Pre-testing.....	31
3.7	Data Analysis.....	31
3.8	Measurement of Variables .....	33
CHAPTER FOUR.....		34
FINDINGS AND DISCUSSIONS.....		34
4.0	Introduction.....	34
4.1	Specific Objectives .....	34
4.2	Demographic Information.....	35
4.2.1	Gender .....	35
4.2.2	Age.....	35
4.2.3	Marital Status .....	36
4.2.4	Educational Status.....	36
4.2.5	Dependants on the Income .....	37
4.2.6	Previous Occupation.....	37
4.2.7	Present Occupation .....	38
4.3	Food Preferences and Acquiring Practices.....	39
4.3.1	Food Acquisition.....	39
4.3.2	Frequency of Buying/ Being Given Food .....	40
4.3.3	Place Where Food is Bought.....	40
4.3.4	Consideration by People Giving Food .....	41

4.3.5	Food Preferences.....	41
4.3.6	Foods Preferred.....	42
4.3.7	Likes and Dislikes of Specific Food Items.....	42
4.3.8	Reasons For Preferring Foods Indicated By Respondents.....	44
4.4	Nutritional Knowledge.....	44
4.4.1	Functions of Food.....	44
4.4.2	Balanced Diet.....	45
4.5	Physiological Characteristics.....	45
4.5.1	Diseases.....	46
4.5.2	Bodily Changes.....	47
4.5.3	Taste of Sugar and Salt.....	47
4.6	Psychological Factors.....	48
4.6.1	Loneliness.....	49
4.6.2	Bereavement.....	49
4.7	Socio-economic Characteristics.....	50
4.7.1	Income.....	50
4.7.2	Sources of Income.....	51
4.7.3	Leisure Time.....	53
4.7.4	Cooking Facilities.....	53
4.7.5	Means of Transport.....	55
4.7.6	Where Item is Bought.....	55
4.7.7	Cost of Item/Food.....	55
4.8	Satisfaction/Dissatisfaction Characteristics.....	56
4.8.1	Need for Modifications.....	56

4.8.2 Specific Modifications.....	56
4.9 Food Frequency .....	57
4.10 Foods Forbidden from Respondents.....	60
4.11 Food Storage and Preparation.....	60
4.11.1 Length of Storage Time for Foodstuffs.....	61
4.11.2 Storage Facilities .....	62
4.11.3 Food Preparation.....	63
4.11.4 Length of Time of Cooking/Preparing Food.....	63
4.12 Nutritional Status.....	65
4.12.1 MUAC.....	65
4.12.2 Body Mass Index.....	66
4.12.3 Descriptive Statistics on Nutritional Status .....	67
CHAPTER FIVE.....	68
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS.....	68
5.0 Introduction.....	68
5.1 Major Findings, Conclusions and Implications.....	69
5.2 Conclusions.....	72
5.3 Recommendations.....	74
5.4 Suggestions for Further Research.....	75
REFERENCES.....	76
APPENDIX 1: RESPONDENTS' FOOD INTAKE SUMMARY.....	79
APPENDIX 2: INTERVIEW SCHEDULE.....	80

## LIST OF TABLES

Table 1: BMI cut-off points for classification of nutritional status .....	32
Table 2 Assessment using weight and armspan.....	32
Table 3 Assessment using weight and height.....	32
Table 4: Age distribution of the elderly in Mathare.....	35
Table 5: Number of dependants on the elderly in Mathare .....	37
Table 6: Previous occupation of the elderly in Mathare.....	38
Table 7: Present occupation of the elderly in Mathare .....	39
Table 8: Elderly's food preferences as considered by those giving/buying them food .....	41
Table 9: Respondents' degree of like/dislike of food items.....	43
Table 10: Elderly persons descriptions of a balanced diet .....	45
Table 11: Physiological changes as experienced by the Respondents.....	46
Table 12: Psychological factors affecting the elderly persons' choice of food ....	48
Table 13: Elderly persons' sources of income .....	52
Table 14: Elderly persons' use of leisure time.....	53
Table 15: Frequency with which food items were consumed by elderly persons in Mathare.....	59
Table 16 : Length of time taken by the elderly persons' to store foodstuff.....	61
Table 17: Elderly persons' storage facilities .....	62
Table 18: Length of time the elderly persons' take to prepare/cook food.....	64
Table 19: Elderly persons' nutritional status using BMI.....	66
Table 20: Descriptive Statistics on the elderly persons' nutritional status.....	67

**LIST OF FIGURES**

Figure 1: Risk Factors For Nutritional Vulnerability In Older People .....	9
Figure 2: Elderly Persons' Income.....	51
Figure 3: Cooking Fuel.....	54
Figure 4: Nutritional Status MUAC.....	65

**LIST OF ACRONYMS**

BMI	Body mass index
MUAC	Mid – upper arm circumference
NGO	Non – Governmental Organizations

## CHAPTER ONE

### INTRODUCTION AND BACKGROUND INFORMATION

#### 1.0 Introduction

Aging is a process experienced by all living creatures as they approach their predestined lifespan. It is intrinsic, deleterious, universal, progressive and irreversible. It begins when growth and development begins to cease and it is a uniquely individual experience that is affected by many factors over which individuals have no control. Society and tradition have provided an arbitrary age of 65 years as a demarcation between middle age and old age that has no basis in the study of human aging process. The arbitrary age of 65 years was established in the 1880s by Bismarck as the dividing line beyond which people became eligible for retirement pensions (Chernoff, 1991).

The United Nations uses a chronological approach, defining older people as those aged 60 years and above. Biological and physiological definitions associate old age with changes in body functions; whereas socio-cultural definitions may link old age with the inability to produce children, the number of children an individual has or issues of retirement from the formal work force (HelpAge, 2000).

According to Cox and Mberia (1976), the elderly are defined as those who are unable to contribute actively to the labour and leadership obligations of adulthood in the African societies. However, this is contradictory of the traditional African context where the elderly played an active role in leadership and decision-making. The gains that have been made in the health, nutrition and

general living standards of people throughout the world have meant rapid demographic transitions from a situation of high fertility and mortality to low ones. Global life expectancy has risen to 66 and is expected to reach 73 years by 2025 (Tarrant, 1999). In developing countries, life expectancy has risen from 53 years in 1970 to 63 years in 1997; and it dropped to 62 in 1998 (UNICEF, 2000).

The result has been a huge increase in the population of older people throughout the world. The United Nations figures indicate that in 1950, the world had 200 million people aged 60 years and above, constituting 8% of the total global population. This population was evenly distributed between developed and developing countries. By 1975, the population had risen to about 350 million, again evenly distributed. Current estimates suggest that of the 6 billion people in the world, 580 million, or 9.8%, are aged 60 years and above. By 2025, it is estimated that this number will increase six fold, bringing the population of older people to 1.2 billion (14% of the total) (HelpAge, 2000).

Estimates suggest that developing regions will experience the largest increases of older people. By 2025, older people in developing countries will constitute 75% of the global total with a declining proportion in Europe, North America and Russia. Africa, it is estimated, will have 100 million older people by 2025 of which 75 million will be in sub-Saharan region (HelpAge, 2000). Another significant development is that most of the world's older population will be made up of women. United Nations projections indicate that between 1985 and 2025 those people aged 70 and above will increase by 32 million males and 38 million females in the developed world and 284 million males and 317 million females in

the developing world. In the same period, those aged 80 years and above will increase to 8 million males and 14 million females in the developed regions and 24 million males and 35 million females in the developing regions (HelpAge, 2000).

People often think that aging is not an issue in third world countries because life expectancies are shorter; but this is not true. Currently the majority, 61%, of the world's population over 60 years of age lives in third world countries. This proportion will increase to 70% by 2025. These populations are aging much faster than they are in industrialized countries. In 1995 the world's population over 60 years of age increased by about 1 million people each month. Nearly 80% of this increase took place in the third world (Tarrant, 1999).

Many factors affect individual aging including such diverse occurrences like genetic inheritance, food supply, society circumstances, political events, exposure to disease, climate and natural disasters, and other environmental events. The aging process may bring difficulties with it and in particular financial insecurity, ill-health or disability. In many countries most people move into old age after a lifetime of poverty, poor nutrition and health care, and frequently years of hard physical labour. In many of the world's poorer countries very few older people receive any kind of pension and those who do, often find it inadequate to meet the most basic needs (Robinson, Lawler, Chenoweth and Garwick, 1990). Therefore older people have to rely on the support of relatives, family or community, or they work to bring in their own income.

In most third world countries, some of the retired elderly return to their

rural homes and some remain in the urban centres. Other elderly people have migrated to the urban centres to live with relatives in the trend of rural-urban migration, which was 22% in 1991 (Kuria, 1995). The elderly in the rural areas do not have many socio-cultural and economic problems since the traditional norms of caring for the elderly, based on family systems, still prevail (Waswa, 1985). However, in the urban centres, the elderly are likely to suffer the rapid socio-cultural and economic changes and western influence. These changes affect the food choices and intake by the elderly. In the older people, food patterns reflect life long attitudes and habits as influenced by the changing environment. These factors include psychological, physiological and socio-economic factors (Schlenker, 1984).

The psychological factors that affect food selection and intake patterns among the aged include loneliness, bereavement, social isolation, food aversion, symbolism of food, food faddism and knowledge on nutrition (Schlenker, 1984). Food taboos may also hinder or prohibit the elderly from choosing and eating particular foodstuffs.

The physiological changes that occur in the elderly bring about loss of appetite, loss of taste, dental problems, chronic diseases, prescribed diets, food intolerance, changes in state of health, physical disability and a degree of physical exercise reduction (Chernoff, 1991). Socio-economic factors also contribute to the changing food patterns of the elderly. These include age, sex, level of income, cooking facilities, daily schedule, retirement and leisure time, level of education, distance to food store/market, availability of transport and the availability of

familiar foods (Schlenker, 1984).

Nutritional adequacy, the outcome of optimum nutrient intake and utilization, is dependent on factors which determine the selection and intake of food supplying both essential nutrients and sufficient energy. This study will address the nutritional issues related to aging and the interrelationship between food selection and intake and nutritional status of the elderly.

### **1.1 Statement of the Problem**

The majority of the elderly have been neglected especially by their family members who do not meet their obligations towards them. This could be due to increased educational levels among people and the awareness of the rapidly changing traditional values due to westernization, modernization and individualism. This in turn has led to people migrating from rural areas to settle in urban areas where jobs are likely to be available. Kithinji (1988) showed that after retiring, many people fail to fit into their local communities. This leads to people settling in the urban areas after retiring. Because of reduced income due to retirement they resort to living in areas which have cheap housing, such as slum areas. Due to the disintegration of the extended family and the system obligations for interdependence, there is an emergence of poor and destitute elderly in urban areas (Waswa, 1985).

For many years nutritional assessment and other primary health care components in Kenya have been directed to maternal and child health care. However, some other vulnerable groups such as the elderly in the population that are at risk in terms of nutritional deficiencies have received little attention.

HIV/AIDS on the other hand, will continue to have a huge impact on elderly people. Like any other population group, they might get infected with HIV, but current education campaigns do not target them. As more people from the working class die, older people are robbed of their main sources of support. Because the majority of those that die come from the younger generation, older people are left to fend for themselves and take care of an increasing number of orphans. This happens when, in most cases, they have disposed of their wealth in an effort to care for their dying children (HelpAge, 2000).

This study was undertaken because conditions of the older people justify an investigation into factors that affect how they select their foods and how this in turn affects their nutritional status. The elderly, especially those in slum areas, are more susceptible to these conditions and because of lack of nutritional knowledge they may end up having poor diets. Since food selection and intake impact on nutritional status, factors influencing food selection and intake have a role in determining nutritional risk within a particular population.

## **1.2 Purpose of the Study**

The major purpose of this study was to examine the psychological, physiological and socio-economic factors that influence food selection and intake patterns and buying practices among the aged in Mathare. The study also assessed the nutritional status of the elderly and their dietary intake. Specifically, the study sought to achieve the following objectives:

### **1.3 Specific Objectives**

- (1). To determine the nutritional status of the elderly in Mathare slums;
- (2). To determine the food preferences, satisfaction/dissatisfaction with foods available in the market for the elderly in Mathare slums;
- (3). To determine factors that influence food selection among the elderly in Mathare slums;
- (4). To investigate the nutritional knowledge of the elderly in Mathare slums;
- (5). To establish the dietary intake of the elderly in Mathare slums;

### **1.4 Limitations**

The study was limited to slum areas in Mathare and any implications and generalizations of findings to other regions should be done with caution. For non-ambulatory elderly persons, and for those who were simply unable to stand for an examination, anthropometry could not be collected using standard methodology. Those who had oedema were not included in the study sample.

### **1.5 Assumptions**

Most of the elderly have a chance to select or choose food items, and prepare meals, either directly or indirectly.

### **1.6 Significance of the Study**

The findings of the study will be useful to those who are in charge of the elderly, that is; institutionalized elderly, non-institutionalized and those who make decisions on food purchases and preparation for the elderly. The study will contribute to the field of knowledge in nutrition and help to stimulate further

research in related areas. The findings will also be useful in improving the nutritional status of the elderly especially slum dwellers, through dissemination of information to churches and other small groups or organizations.

## 1.7 Description of Variables

### 1.7.1 Independent Variables

- (i) *Age:* The chronological age of a respondent.
- (ii) *Income:* Sources of income or the total monthly income from wages, business etc.
- (iii) *Education:* The level of education of the respondents either primary, secondary or tertiary education.
- (iv) *Marital Status:* Whether the respondents are married, separated, widowed or single.
- (v) *Household Size:* The number of people sharing a house and cooking and eating together.
- (vi) *Psychological factors:* Such as loneliness, bereavement, social isolation and nutrition knowledge.
- (vii) *Physiological factors:* Include loss of appetite, taste, dental problems, chronic diseases, food intolerance, state of health, physical activity and degree of exercise.

### 1.7.2 Dependent Variables

- (i) *Food Choice/Selection:* Foods frequently chosen, bought, or eaten.
- (ii) *Nutritional Status:* The state of health of the individual as influenced by nutrient intake and utilization.

- (iii) *Preferences*: What the respondents opt to buy or eat.
- (iv) *Satisfaction/dissatisfaction*: The degree of contentment of the respondents with the foods they eat.

## 1.8 Definitions of Terms

- Armspan**: Measurement of outstretched arms from the tip of the middle finger of one hand to the other.
- Elderly**: Persons who have attained 55 years and above.
- Food preferences**: The degree of like or dislike for a particular food item.
- Halfspan**: Measurement of one outstretched arm, from the tip of the hand to the neck.
- Kyphosis**: Curvature of the spinal cord due to aging that causes stooping.

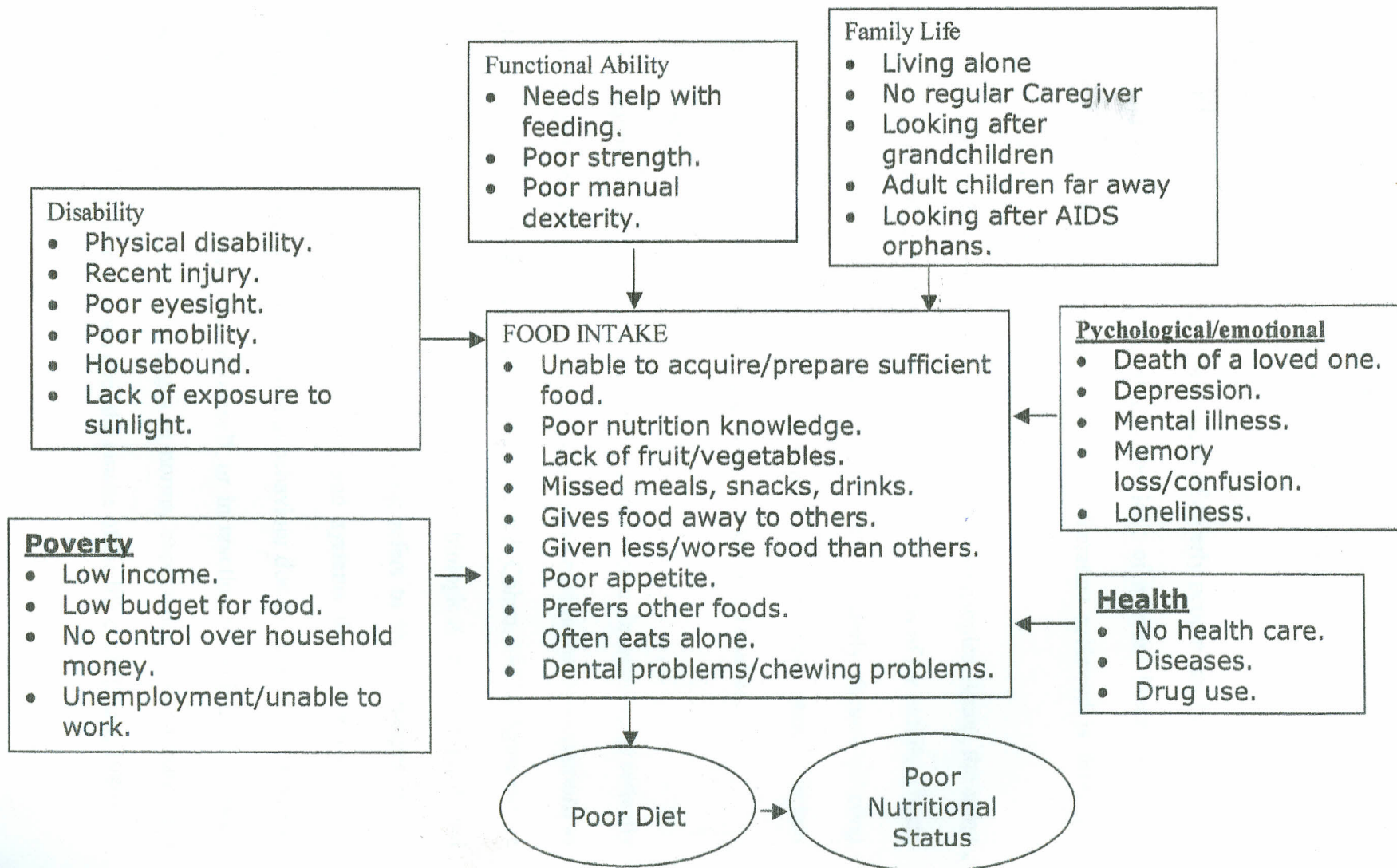
## 1.9 Conceptual Framework

In order to address the various aspects of the study, selected aspects from the model on risk factors for nutritional vulnerability in older people by Ismail and Manandhar (1999) were employed (see Figure 1). Risk factors for malnutrition are the underlying reasons why people eat less or eat poorly. Individuals having one or more risk factors are more likely to become malnourished. Different risk factors are often linked to each other and they may be more or less common in certain situations (Pojsda, 1999).

Some risk factors are not solely associated with food but they may affect the food intake of an older person. Several of these factors, or just one may lead to a poor diet and poor nutritional status as a result. From Figure 1, the conceptual framework on the risk factors affecting the elderly, some factors were selected.

Figure 1 :RISK FACTORS FOR NUTRITIONAL VULNERABILITY IN OLDER PEOPLE

(Source: Ismail & Manandhar, 1999)



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

Little work on the nutritional status of elderly people has been done in Africa and other developing countries. The lack of relevant literature in the developing countries means that the bulk of literature reviewed is from the Western or developed countries.

Literature has been reviewed under the following topics: Aging, the aging process, the elderly, attitudes about aging, nutritional status of the elderly, effects of the aging process on the nutritional status of the elderly, factors affecting nutritional status of the elderly, assessment of nutritional status, factors influencing food habits among the elderly as well as related studies.

#### 2.1 Aging

Aging refers to the regular changes that occur in mature, genetically representative organisms living under representative environmental conditions as they advance in chronological age (Birren, Sloane & Cohen, 1992). Aging can be defined as occurring in three levels namely: biological, psychological and sociological (Cattell, 1990). Biological aging refers to those changes in the structure and functions of body organs and systems that occur over time. Psychological aging refers to changes in behaviour due to increased experience, changes in one's perceptions of oneself, or in reaction to biological changes. Sociological aging includes changes in norms, expectations, social status and social roles available to persons over the course of the life cycle (Zarit, 1980).

A distinction has been proposed between the young-old; persons between ages of 55-75 years and the old-old; those individuals over 75 years (Zarit, 1980). The category of the young-old is seen as the result of a combination of factors, including early retirement, economic prosperity and better health care. These social changes have produced a group of active and energetic older persons who differ considerably from the social stereotypes of old age. In contrast, at the advanced ages of the old-old, persons are more likely to have the infirmities generally considered part of old age.

### **2.1.1 The Aging Process**

Aging is a continuous process that begins with conception and ends with death. Each species appears to have a built-in limitation of the life span; moreover, within the organism each cell type has a given lifespan. With time there is a decline in the number of functioning cells of various organs so that performance is reduced. For example a reduction in the number of taste buds reduces taste acuity and may modify the acceptance of food; a reduction in the number of functioning nephrons reduces glomerular filtration and renal blood flow so that wastes are less efficiently removed (Whitney, Cataldo and Rolfes, 1991).

### **2.1.2 The Elderly**

The elderly are those who are near the end of the life long process of aging. They are those who are close to death simply because of years and physical condition. Biomedically, aging may be defined as the deteriorative changes that occur in the post-reproductive period when the human organism has completed

the task of perpetuation of the species (Kuria, 1995). Elderly persons are often defined as those individuals who have reached the age of 65. Dillard and Feather (1988) state that old age is just like childhood, youth and middle age and it has its challenges and difficulties just like any other part of life. Waswa (1985) studied elderly people from age 50 while Ethangatta (1988) studied elderly people from ages 55 years and above.

### **2.1.3 Attitudes About Aging**

Both lay persons and many mental health professionals view the later years as something to avoid, if at all possible. By putting old age out of our minds, perhaps we hope that it will go away, or that at least we will not “catch it” (Zarit, 1980). In general, the aged are viewed as uninteresting and having little to contribute to others. There is also a tendency for younger persons to integrate the problems experienced by the old. The aged are considered by persons under 65 years to be of poorer health, to have more money problems, to be lonelier, and to be more frequently the target of street crime in the West than is actually reported by older respondents (Zarit, 1980). One manifestation of these negative beliefs is the feeling that it is of more value to treat younger persons, because they have their whole lives ahead of them, while an older person is likely to die soon. Persons aged 65 can expect to live for another 15 years. Persons who live to be 90 have one-third of their lives ahead of them at 60.

## **2.2 Nutritional Status of the Elderly**

Nutritional status is the condition of health of the individual as influenced by the utilization of nutrients. It can be determined by correlation of information

obtained through careful medical and dietary history, a thorough physical examination and appropriate laboratory investigations and anthropometric measurements (Robinson et. al, 1990). Studies done on the nutritional status of the elderly show that most elderly people are malnourished. A study done in rural Malawi by Chilima (1998) showed that the elderly were underweight, that is; BMI below  $18.5\text{kg/m}^2$  was prevalent in 36.1% of males and 27.0% females. Using MUAC cut off points of 23cm for men and 22cm for women, 20.4% of men and 10.0% of women were classified as malnourished.

Another study carried out by Waswa (1985) in Embu District, Kenya showed that the elderly had weight for height below 88% of the standard and haemoglobin was below the standard, that is, 13% for men, while women had 8%. Fifty nine percent of the entire sample was below 80% MUAC standard. Ethangatta (1988), found out that low income elderly women living in Nairobi are at nutritional risk. Findings from anthropometric, dietary and biochemical data indicated that large proportions of subjects in the two study areas (slum and low income) had indices that were below the normal international values. It further showed that poverty has a major role in the prevalence of poor nutritional status among the elderly.

Another study by Tesfaye, et. al., (2000) in Zeway, Central Ethiopia showed that undernutrition was a major problem for the elderly. The mean BMI (in  $\text{kg/m}^2$ ) was 19.9 in males and 20.3 in females. However, the overall prevalence of undernutrition among the elderly as estimated by BMI was 30.5%. Using MUAC cut off points of 23cm for males and 22cm for females, a higher

proportion of the elderly (35.7%) were identified as malnourished.

### **2.3 Effects of the Aging Process on the Nutritional Status of Elderly Persons**

Aging per se is unlikely to cause malnutrition in the absence of associated diseases or stressful events. Although social and behavioural causes are probably important, alterations in digestive and metabolic functions have an adverse impact on the maintenance of nutrition in elderly patients (Vellas, 1992).

Normal senescence causes a reduction in some physiological gastrointestinal functions like alterations in pancreatic and intestinal functions. The aging process study (APS) done for nine years in Britain showed that the aging process alone has no important consequences on the nutritional status of healthy elderly people and the apparent requirements in this elderly population seem to be near the requirements for young adults, with few modifications (Vellas, 1992).

Most of the important changes in nutritional status seen in elderly persons are secondary to diseases, medications, trauma, and living situation. One typical characteristic of older persons is the inability to recover completely weight lost due to a stress such as surgery. In such situations incapacity and disability often causes anorexia (Munro & Gunter, 1992).

### **2.4 Factors Affecting Food Choice and the Nutritional Status of the Elderly**

The factors that affect the Nutritional Status of the elderly can be divided into two broad categories:

- (a) Those factors that are the result of metabolic and physiological changes associated with aging; and

(b) Those factors that affect the amount and type of foods eaten. This latter group includes socio-cultural factors, which are probably the most important influences on eating habits at any age.

#### **2.4.1 Factors Affecting Metabolism and Physiology**

The decrease in caloric need from age 55 onward is the result of a slowing down of basal metabolism because of a loss of cell and tissue mass and the diminished activity patterns associated with aging. Along with these changes there is a decrease in the capacity of blood vessels to nourish and the ability of the body to re-establish balance (Kart & Manard, 1981).

Other changes in the body's digestive and absorptive capacities are clearly associated with nutritional problems common to the elderly. Deterioration of the salivary glands and other changes that dry out the mouth can lead to the selection of soft self-lubricating foods. This practice can contribute to chronic lower bowel problems such as constipation, problems of the hepatobiliary tract that can lead to fat maldigestion. This in turn can affect the body's utilization of fat-soluble vitamins such as A, D, E and K. These and other changes of the same type present a biophysical background for the nutritional problems of the elderly that differs markedly from younger age groups (Kart & Manard, 1981).

#### **2.4.2 Factors that Determine Food Intake**

Metabolic and physiological barriers to proper nutrition are minor compared to those factors that regulate the actual intake of food. Factors that govern actual intake determine the quality, quantity and combinations of foods eaten. The same factors that affect food intake are also intricately interwoven into

the fabric of the elderly person's social life. Food is more important to the elderly for socio-psychological reasons than it is for proper nutrition and physiological well-being (Kart & Manard, 1981).

Some biophysical changes affect the choice of foods to be eaten. Loss of teeth or the existence of denture problems can lead to a dietary modification that stresses foods that are softer and easier to chew. These kinds of chewing problems are further complicated by decreased salivary secretion and a tendency toward dry mouth, which make mastication and swallowing uncomfortable. The diminished sense of smell and taste caused by declining numbers of taste buds and a number of neurologic problems can affect the appetite. Diminished sense of taste can lead to over-seasoning of foods. This can irritate other sensitive parts of the digestive tract and in the case of salt, contribute to hypertension, heart disease, and kidney malfunction (Kart & Manard, 1981).

Loss of neuromuscular co-ordination is a biophysical problem associated with aging that is sometimes complicated by a stroke, Parkinson's diseases chronic arthritis and visual disorders. Neuromuscular problems often lead to the inability to handle certain utensils, appliances or foods. At home alone, this inability can lead to inefficient use of food resources, and in the presence of other people, it is a source of embarrassment often leading to the elimination of important foods (Kart & Manard, 1981).

The presence of chronic diseases, sometimes more than one at a time, can call for modified diets as well as one's energy to perform daily routines. Modified diets are often expensive and difficult to follow, especially if the person does not

fully comprehend the situation. Many people experience discomfort with the ingestion of certain foods. This discomfort may be biophysically based, but more often its cause is psychological (Kart & Manard, 1981).

Decreased physical activity is related to many aspects of aging. Exercise is needed to aid in the metabolism of foods and is useful in relieving tension and promoting mental well-being. Decreasing vigor affects one's ability as well as desire to take part in physical activity. It is also probable that mental stress from depression and anxiety can further inhibit one's participation in physical activity. This inactivity-stress syndrome is common among the elderly. It can further affect the motivation and energy necessary to shop for and prepare food. Lack of energy to shop or prepare meals results in an emphasis on easily prepared, high carbohydrate foods such as bread, jam, jelly, or ready to eat cereals, often with a high sugar content (Kart & Manard, 1981).

Dietary habits are long standing and may be associated with both pleasant and unpleasant memories of youth. The tendency to establish an attachment to certain foods may represent a form of security at a time when one's level of insecurity is quite high (Schlenker, 1984).

Income is a primary factor in determining diet at any age. Ethangatta (1988) found out that poverty has a major role in the prevalence of poor nutritional status among the elderly in urban areas. Income is greatly reduced in old age. Many elderly shoppers cannot buy food on the basis of past food habits or optimal nutrition because of lack of buying power. Expenditures for food must compete with other necessary expenditures such as rent and utilities. Thus there may be a

tendency for the elderly person to purchase cheaper foods higher in carbohydrates rather than the more expensive, protective foods such as meat, fruit and legumes (Kart and Manard, 1981).

A food frequency completed at the sisters of Tharbes project in Kibera by HelpAge International showed that plant sources formed the greater part of the diet, and that cereals were the main food items of their diet. Fruit consumption was low and that low income was an impediment to proper nutrition. It also revealed that food preferences were not met and that due to poverty there were other competing needs for the limited income (HelpAge, 2000).

The elderly are often forced to shop at more expensive stores or shops. This situation may be caused by the absence of chain stores or supermarkets in their neighbourhood or lack of transportation to the volume sales chain stores or markets with their lower prices. The elderly are not often able to take advantage of sales or quantity discounts because they lack proper storage facilities, including refrigeration and cupboards. Modern marketing procedures are geared towards the younger consumer and are generally family oriented. The elderly require smaller amounts of food that may be unavailable for sale, or if available more expensive. Small quantities are especially important for those living alone and those with storage problems (Kart and Manard, 1981).

For the elderly, food can serve as an important psychological comforter during times of loss, such as the loss of a loved one or the loss of an individual's social involvement. Foods may be associated with significant events or periods in the lives of old people and the lives of their loved ones. The adjustment to loss of

one's mate is difficult and can be the source of major dietary stress. Aside from the financial and management problems related to the loss of mate, the loss of companionship can seriously affect one's motivation to shop, cook, eat, remain active, or in some cases go on living. This loss of a companion may reduce physical activity or social participation that had previously diverted attention from many of the problems associated with old age (Kart & Manard, 1981).

Emotional stress and deprivation is often associated with changing roles, isolation, chronic disease and disabilities and fear of getting old. This can lead to a loss of appetite and to the development of negative protein and calcium balances because of increased excretion associated with stress. An elderly person who feels rejected or neglected by his/her family and friends will often use food as an attention getting device. People may not listen if you say you are lonely or your arthritis hurts; but if you are not eating, they may worry and begin to pay some attention (Kart and Manard, 1981). Ethangatta (1988) indicated that 4% of the elderly women lived with a child, or a spouse or a relative. Most of the elderly live alone. This affects the way they get their food and even preparation especially those who have physical disabilities. Numerous other factors probably operate in cases of elderly persons who do not get enough to eat. Lack of adequate cooking facilities may be a problem for those living in many kinds of low-cost housing. The presence of old and sometimes dangerous cooking or kitchen utensils may discourage use (Kart and Manard, 1981).

Another factor that may affect dietary intake is landlessness. In most communities the elderly give the land to their sons and they remain with nothing.

On the other hand, Waswa (1985) reported that there is collapse of social-support structures in the rural areas. This means that the elderly are left landless and are neglected by their grown children.

HIV/AIDS places a burden to the elderly and because the majority of those that die come from the younger generation, older people are left to fend for themselves and take care of an increasing number of orphans. This happens when in most cases, they will have disposed of their wealth in an effort to get a cure for their dying children (HelpAge, 2000).

## **2.5 Assessment of Nutritional Status**

Assessment of nutritional status is the process of estimating the nutritional position of an individual or a group, at a given time by using indirect (proxy) measurements of nutritional adequacy (Gibson, 1990). A combination of methods should be used to give reliable data. The following indicators can assess nutritional status:

### **2.5.1 Clinical Assessment**

Physical assessment can ascertain a great deal about nutritional status by carefully assessing the state of hair, skin, nails, musculature, eyes, mucosa and other physical attributes. Another clinical manifestation associated with nutritional deficiencies in elderly people is fluid imbalance. Overhydration that contributes to oedema is probably less of a nutritional problem than is dehydration. Dehydration in the elderly presents itself through mucosal xerosis, swollen tongue, sunken eyelids, elevated body temperatures, decreased urine output, constipation, nausea and vomiting, decreased blood pressure, mental

confusion, acute renal failure, altered drug effects and electrolyte disturbances (Chernoff, 1991).

It is also valuable to assess the individual's ability to chew, swallow, and self-feed while evaluating the condition of the teeth, tongue, gums and oral mucosa. Poor oral status may be both the etiology and manifestation of poor nutrition. A study done by Waswa in Embu showed that pallor comprised 6.7% of the illness that affect the elderly while thyroid enlargement comprised 1.9%. Dental carries and periodontal disease were very common accounting for 57.7% of the illnesses. Most signs of malnutrition are not specific to lack of one nutrient and can often be produced by various non-nutritional factors which may have a complex etiology (Jelliffe (1966) cited in Waswa, 1985). Other factors which may have an influence on the nutritional status include balance of foods in the prevailing diet, genetic influences, age and activity of the individual, plus the environment in which the person lives, in regard to hygiene, climate and exposure to infection and parasitosis (Waswa, 1985).

### **2.5.2 Anthropometric Assessment**

Anthropometry is the technique by which the severity and composition of morphologic changes can be evaluated easily. The anthropometric measurements most commonly used for assessing nutritional status are height, body weight, circumferences and skinfold thickness. A major objective of anthropometry in nutritional assessment is to establish an individual's protein-energy reserve compared with the normal ranges. The major physiological effect of malnutrition is a detrimental alteration of body composition. Protein Energy Malnutrition

(PEM) is first evidenced by loss of lean body mass and fat tissue. Obesity is characterised by an abnormal increase in body fat tissue, contributing to an increased risk for many chronic diseases (Chernoff, 1991).

#### **2.5.2.1 Weight**

Weight tends to increase until the early 40s in men and the early 50s in women, to hold relatively steady for the next 15-20 years, and to decrease thereafter (Chernoff, 1991). A decrease in lean body mass is characteristic regardless of energy intake. Waswa found out that 80% of the individuals had weight for height below 90% of the standard. While 59% had MUAC below 80% of the standard. This shows that most elderly people are undernourished. Ethangatta found out that the elderly male subjects are more malnourished than women. For the purpose of this study, weight, height, MUAC and armspan measurements were taken.

#### **2.5.2.2 Height**

Almost all of the currently used indicators of appropriate body weights as well as other measures of lean body mass, require knowledge of the individual's height. Accurate measurements of stature are particularly difficult to obtain from most aged subjects because the physical changes that occur with aging make it difficult or even impossible for many elderly people to stand erect. Chronic diseases, such as arthritis, osteoporosis, and Parkinson-like disorders, which affect the neuromuscular systems, contribute to this problem. Individuals who have severe kyphosis and bowing of the legs present major problems in obtaining accurate measures of height.

To measure stature in elderly subjects who are able to stand unaided in an

erect position, they should be measured without shoes and in little or light clothing to allow viewing of the position of the body. They should stand on a flat surface that is at a right angle to the vertical board of a stadiometer. They should stand up straight, with heels close together, legs as straight as possible, arms at the sides, and shoulders relaxed. The head should be in the frankfurt horizontal plane; the head piece is then lowered onto the crown of the head. Measurements are recorded to the nearest 0.1 cm. A repeated measurement should be made to assure reliability and should agree within 1 cm. of the 1st measurement (Ismail & Manandhar, 1999).

Mid-Upper Arm Circumference (MUAC) is measured at the mid-point between the acromial process of the scapula and olecranon with the elbow extended and the arm relaxed and hanging just away, from the side of the trunk, with the palm facing the thigh.

Alternative methods for investigating stature for those who cannot stand erect include armspan which is highly correlated with stature. Armspan includes both arms and the breadth of the shoulders, and is measured with the subjects arms outstretched maximally. Halfspan can be taken if the person's back is badly bent. Halfspan is taken by putting your finger on the middle of the respondent's chin and slide it down to the front of the throat until you feel a bone at base of the neck which is shaped like a 'U'. Measurement is taken from this point to the tip of the middle finger of the straight arm. This measurement is multiplied by two and used as armspan (Ismail & Manandhar, 1999).

### **2.5.3 Dietary Assessment**

Dietary assessment of elderly subjects provides insight into both present and past nutrient consumption habits. Dietary assessment methods should be able to uncover those who are having problems consuming an adequate diet, those who limit their intake to one or two foods or categories of food, those who follow unusual dietary patterns or those who exclude an important food or food group.

Methods available for collecting dietary intake data include diet histories with food frequency checks, food records kept over a specific time period, weighed intake and 24-hour dietary recalls (Gibson, 1990). Food frequency questionnaires are designed to obtain qualitative, descriptive data on usual intakes of foods or classes foods over along time period. Record is obtained by interview or self-administered questionnaires. Questionnaires can be semi-quantitative when subjects are asked to quantify usual portion sizes of food items, with or without the use of food models (Gibson, 1990).

## **2.6 Factors Influencing Food Habits/Intake**

The food habits of the elderly are the result of the lifetime influences of cultural, social, economic and psychological factors. Insufficient income is probably the chief factor limiting dietary adequacy. Poverty is twice as prevalent in women as in men (Robinson et. al., 1990). Housing is a major problem for many older persons living in a single room with no facilities for food preparation, as is the lot of many elderly persons. Transportation to shopping facilities, physician, dentist and churches is a serious problem for many older people. Shopping itself can be a problem. With thousands of items in supermarkets, the

shopper finds it more difficult to make economical, nutritional choices. Failing vision means that one cannot read the fine print on labels or compare costs of various brands. Waswa (1985) found out that 2.6% did not eat certain foods because of chewing problems while 21% did not eat because the food was not available.

Loneliness and social isolation powerfully affect food intake. Some older adults have lost their loved ones, live far away from their children, or are neglected by their relatives. They often have little desire to prepare meals and may eat only those foods that are conveniently available. Others eat compulsively to assuage their feelings of loneliness, depression and despair. Erratic eating habits in turn perpetuate the mental depression. Studies done by Waswa (1985), Ethangatta (1988) and Kithinji (1988) show that 70% of the elderly stay alone. Man being a social being needs to interact with others for a balanced living. In addition to normal interaction there is need to share deeply and intimately on certain concerns and aspects of one's life. A confidant is very important in the life of older people. Kithinji (1988) found out that a confidant is essential to share ideas with, to get advice from, and to avoid loneliness.

## **2.7 Summary of Related Studies done in Kenya**

Similar studies that have been done in Kenya include aging and retirement in Kenya by Kithinji (1988). In this study the aged were defined as those who have attained 55 years and above, i.e; the mandatory retirement age for teachers in Kenya. The study revealed that most retired teachers continue working after retirement and they are satisfied with the meals they eat. Only 17% reported

reduced income (Kithinji 1988). Decreased income and poor health were partly to blame for the deterioration of nutrition among the elderly. It revealed also that ignorance of good nutrition could also be a problem.

The other study done by Waswa (1985) in Embu revealed that 15-20% of the elderly were malnourished and most of them (69%) had health problems. Many didn't have a constant income and most of those living alone were over 70 years. The most common mineral deficiency disease was anaemia.

Ethangatta (1988) in her study found out that males were more malnourished than females. Poor dental status was shown as a cause of malnutrition. Poor dental status in the aged has a bearing on the foods they choose to eat. In many instances such victims will only drink less nutritious beverages such as tea, porridge or eat soft foods such as bananas, or potatoes or skip any food that involves proper chewing. Another study done by Kigutha, Van Staveren and Hautvast (1998) on seasonal changes in food availability and nutritional status of the elderly in Nakuru district revealed that men had a mean weight loss of 4.0kg in the lean season while that of women was 1.7kg. Seasonal changes in household food availability influence dietary intakes: lean months (6.9MJ/1651 Kcal) and postharvest period (8.8MJ/2105 Kcal). It also revealed that there was relatively high intake of energy though not enough to maintain energy balance during periods of heavy physical activities. This study targeted elderly people between 65 and 75 years of age: 23 women and 18 men were studied.

Due to the factors discussed above, it therefore necessitated an investigation to the factors affecting food selection in the home-based elderly.

## CHAPTER THREE

### METHODOLOGY

#### 3.0 Introduction

This chapter describes the procedures and strategies, which were used in the study. It gives the research design, description of the study area and population, the sample size and sampling procedures, research instruments, pre-testing of the instruments, data collection procedures and data analysis.

#### 3.1 Research Design

A descriptive survey design was used in the study to determine the food selection and intake patterns, their nutritional status and the satisfaction or dissatisfaction with consumption patterns. A survey was used because it explores relationships between different variables in their natural setting and it also allows for extensive data collection within a short period of time. The design also allows for collection of both quantitative and qualitative data at the same time (Borg and Gall, 1989).

#### 3.2 Description of the Study Area

The study area was Mathare slums – both Mathare North and Mathare Valley were covered in the study. Mathare is the oldest slum in Nairobi and it has diverse ethnic groups living there. There are also people of different socio-economic backgrounds and therefore provided a fertile ground for this study. It also provided a central market for agricultural products, hence a variety of foods to choose from by the elderly or their caretakers. Moreover, in recent years, many elderly people have migrated from rural to urban centres than was the case several

decades ago (Central Bureau of Statistics, 1991).

### **3.3 Target Population**

The population targeted for this study consisted of the elderly; both men and women who had attained 55 years and above living in Mathare slums. Fifty-five years was used as the cut-off point because it is the retirement age in Kenya and aging in developing countries starts much earlier. Furthermore most studies in Africa use 50-55 years as the cut-off point. The age of the respondents was determined by use of the identity cards (for those who were not sure of their exact age). They could also be asked about dates of important historical (for example 1st and 2<sup>nd</sup> world wars) and social events to confirm their age. This method proved important especially for those who disputed the years shown in their identity cards or those who could not produce the cards. This study included elderly people staying alone, with a spouse or with other dependants.

### **3.4 Sampling Procedures and Sample Size**

The researcher obtained a list of elderly people (55 years and above) living in Mathare slums from the area Chief. This formed the sampling frame. The researcher then divided Mathare slums into 3 clusters using the existing divisions (areas 1, 2, 3 and 4). Systematic sampling was used to obtain 90 elderly people who comprised the sample size. In this method, every K<sup>th</sup> case in the sampling frame is selected for inclusion in the sample (Mugenda and Mugenda, 1999). From the list, 30 elderly people were selected from each cluster. Every 3<sup>rd</sup> person in the first cluster and every 4<sup>th</sup> person in the second and third clusters were picked for interview until a total of 30 people were obtained for each cluster. In

cases where there were two elderly in a household, the woman was preferred because of their small number in the sampling frame. Moreover, women are the ones in most households who select and prepare meals.

### **3.5 Data Collection, Instruments and Procedures**

Data were collected using an interview schedule because the elderly have various literacy problems for example poor eyesight, illiteracy and language problems (Ethangatta, 1988). Where necessary, the instrument was translated to Kiswahili. Where Kiswahili was not understood, a trained interpreter was used. This was used to collect information on food choices, preferences, satisfaction and dissatisfaction and demographic information. The instrument was divided into eight sections: demographic information, food preferences and acquiring practices, physiologic characteristics, psychological factors, socio-economic characteristics, satisfaction and dissatisfaction characteristics, food storage and preparation, and nutritional status assessment.

Anthropometric measurements were taken, that is MUAC, weight and height. MUAC tape, bathroom scale, and stadiometer were used to collect anthropometric data. Armspan measurements were taken to determine stature for those who had stooped due to kyphosis because of aging. For those who could not stretch both hands, halfspan measurement was taken. The researcher explained the purpose of the study to the respondents and assured them of confidentiality before the actual interview began.

Dietary assessment was done using a food frequency questionnaire. This uses comprehensive list or list of specific food items to record intakes over a

given period (day, week, month, year) (Gibson, 1990).

### **3.6 Pre-testing**

Pre-testing of the instruments was done in Korogocho slums on 10 elderly persons with similar characteristics identified for convenience who were not included in the study. Pre-testing was done to check the reliability and validity of the instruments. In case of any bias and flaws, the interview schedule and observation guide were modified for more clarity and accuracy.

### **3.7 Data Analysis**

Both qualitative and quantitative data were collected for the study. Data cleaning was done. Common themes were obtained from the data collected and clustered in a patterned order as addressed by the objectives so as to identify variables that depict general concepts. Inferences and conclusions were then drawn from the findings.

Quantitative data was analyzed using the SPSS (statistical package for social sciences). Descriptive statistics was used because it allows for meaningful description of a distribution of scores or measurements using a few indices or statistics (Mugenda and Mugenda, 1999).

Frequencies, percentages and tables were used to present results. Anthropometric data was analysed and using the body mass index (BMI) cut off points, individuals were classified as severely obese, obese, normal, undernourished or severely undernourished. The BMI cut-off points given below were used to classify the individual according to their Nutritional Status.

Table 1: BMI cut-off points for classification of Nutritional Status

BMI (kg/m <sup>2</sup> )	NUTRITIONAL STATUS
<16	Severely malnourished
16-18.5	Borderline
18.5-24.5	Normal/adequate nutrition
25-29.5	Plump/Obese 1
30-39.5	Obese 2
>40	Severely Obese

Source: Ismail and Manandhar, (1999).

MUAC cut-off points of 23cm for men and 22cm for women (Ismail and Manandhar, 1999) were used to assess the nutritional status of the respondents.

Table 2 Assessment using weight and armspan

Armspan (cm)	Weight (kg)	BMI (kg/m <sup>2</sup> )	Nutritional Status

Table 3 Assessment using weight and height

Height (cm)	Weight (kg)	BMI (kg/m <sup>2</sup> )	Nutritional Status

Information from dietary assessment was analysed qualitatively and the respondents' intake were classified as low, medium or high.

### **3.8 Measurement of Variables**

**Food Selection:** The frequency with which individuals include certain selected food items in their menu.

**Educational Status:** The level of education achieved by formal learning in an institution like primary, secondary, or training.

**Satisfaction with Food Selection:** The respondents' contentment with their food selection and consumption: Responses were yes or no.

**Monthly Income:** The total amount of money earned or given to the respondents per month.

**Food Preference:** The degree of like or dislike of certain selected foods. Responses were 'dislike', 'neutral', or 'like'.

## CHAPTER FOUR

### FINDINGS AND DISCUSSIONS

#### 4.0 Introduction

The purpose of this study was to examine the psychological, physiological and socio-economic factors that influence food selection and intake patterns and buying practices among the elderly in Mathare slums. The study also assessed the nutritional status of the elderly in relation to their dietary intake.

#### 4.1 Specific Objectives

The following were the objectives of the study:

- ❖ To determine the nutritional status of the elderly in Mathare slums;
- ❖ To determine the food preferences, satisfaction/dissatisfaction with foods available in the market for the elderly in Mathare slums;
- ❖ To determine the psychological and socio-economic factors that influence food selection and intake among the elderly in Mathare slums;
- ❖ To investigate the nutritional knowledge and gender impacts on the nutritional status of the elderly in Mathare slums;
- ❖ To establish the dietary intake of the elderly in mathare slums.

The results of this study have been reported under the following sub-headings :

- ❖ Demographic information
- ❖ Food preferences and acquiring practices
- ❖ Nutritional knowledge
- ❖ Physiological characteristics
- ❖ Psychological factors

- ❖ Socio-economic characteristics
- ❖ Satisfaction/dissatisfaction characteristics

## 4.2 Demographic Information

The demographic information has been reported under the following sub-headings: gender, age, marital status, educational status, dependants on the respondents' income, and the previous and present occupation.

### 4.2.1 Gender

Out of the 90 interviewed respondents 57 (63%) were males and 33 (37%) were females. This may be explained by the fact that most women had remained in their rural homes as their husbands go to towns to seek jobs. Retirement may also have contributed to the few employed women, just like some men, moving to the rural areas.

### 4.2.2 Age

Table 4: Age distribution of the elderly in Mathare

Age	Frequency (f)	Percentages (%)
55-59	53	59
60-64	11	12
65-69	10	11
70-74	11	12
75 and above	5	6
Total	90	100

Results in Table 4 show that 59% of the respondents fell within 55-59 years of age. Only 6% fell in the group of 75 and above. This could be explained by the fact that most people between ages 55-59 feel still strong and can still work unlike those of 75 years and above who retire to the rural areas where the extended family can take care of them or to homes for the elderly. Recent trends, however, show that the number of elderly people remaining in urban centers or migrating to towns to stay with relatives is steadily rising (UNICEF, 2000).

#### **4.2.3 Marital Status**

Fifty nine percent of the respondents in the sample were married, 7% were single while 11% were separated. Twenty two percent were widowed and most of these were women. Only one person was widowed and remarried. Marital status does influence one's food choices and therefore intake. Single persons' food selection and consumption will differ from those of married couples because they can sometimes be lonely or just lack the motivation to prepare foods.

#### **4.2.4 Educational Status**

This section sought to establish the respondents' level of formal education. Fifty percent had primary education, 39% had no formal education; a majority of these being women, while 11% had secondary school education. Because this was a slum area, most people were of low educational level and therefore low income and sought cheaper housing in the slums. The educational level of an individual is normally associated with improved food consumption. However, this relationship is not always linear, because adequate food intake rarely results from knowledge

alone. Normally, it is assumed that education enables one to get a good job and consequently the ability to afford most foodstuffs. However, this is not always the case because a number of educated people do not get jobs.

#### 4.2.5 Dependants on the Income

The number of dependants may affect the type of food chosen and eaten in a household.

Table 5: Number of dependants on the elderly in Mathare

No. of dependants	Frequency (f)	Percentages (%)
None	4	4
1-3	4	4
4-6	37	41
7-9	26	29
10-13	14	16
14 and above	5	6
Total	90	100

Four percent of the respondents had no dependants, 41% had 4-6 dependants, 29% had 7-9 dependants while 6% had more than 14 dependants. There was a case of a herbalist, aged 80, who had 53 dependants and 13 wives. A large number of dependants may not allow one to choose good quality foods especially if the income is low.

#### 4.2.6 Previous Occupation

The previous occupation of the respondents was checked to determine how it related with what they were doing currently. Some experiences, skills and even wealth or savings gained before retirement can be useful thereafter.

Table 6: Previous occupation of the elderly in Mathare

Occupation	Frequency (f)	Percentages (%)
Skilled Worker	25	28
Pastor	1	1
Unskilled Worker	17	19
Professional	5	6
Herbalist	1	1
Housewife	6	7
Business	23	26
Entertainer	1	1
Farming	5	6
Security	6	7
Total	90	100

Twenty eight percent of the respondents were skilled workers and they used to do various types of work like masonry, carpentry and painting. Nineteen percent were unskilled doing odd jobs and especially manual work. Seven percent were housewives before coming to Mathare, 7% used to be security men whereas 6% were farmers. Twenty six percent were doing business whereas 6% were professional workers.

#### **4.2.7 Present Occupation**

The present occupation was checked to determine what the respondents were presently doing or engaged in.

Table 7: Present occupation of the elderly in Mathare

Occupation	Frequency (f)	Percentages (%)
None	3	3
Homemaker	11	12
Pastor	1	1
Business	29	33
Taking care of Grandchildren	9	10
Herbalist	4	4
Manual Worker	9	10
Security	13	14
Social Worker	2	2
Skilled Worker	6	7
Professional	3	3
Total	90	100

Thirty three percent were earning their living from business. Most of these did odd businesses ranging from selling charcoal and firewood to selling cooked food on the streets outside their houses. Fourteen percent were security men, 12% homemakers while 10% were taking care of grandchildren. The occupation of an individual is believed to influence his/her food choices. Individuals with better paying jobs are expected to select and consume better quality foods which are normally more expensive as compared to poor quality foods.

### **4.3 Food Preferences and Acquiring Practices**

#### **4.3.1 Food Acquisition**

This item sought information concerning ways the respondents acquired their food. Seventy percent of the respondents bought food for themselves, 12%

bought and were given by their children and friends and 9% solely depended on help from their children and friends. Three percent were given food by the church, the hospital and social groups while 4% were supported by these well-wishers. Only two people were being supplied with food from their farms upcountry.

#### **4.3.2 Frequency of Buying/ Being Given Food**

Seventy three percent bought or were given food when money was available, 18% bought food when it was necessary while 6% bought food occasionally. Only one respondent used to stock food and two others bought or were given food when money was available and the food was needed. The majority bought food for a meal depending on the money available. According to some of them they sometimes went hungry when there was no money.

#### **4.3.3 Place Where Food is Bought**

Forty nine percent of the respondents bought food from the open-air markets within the slums, 20% bought from people selling foods from house to house and 6% bought food from the supermarkets. Seventeen percent got their food from both the open-air markets and the supermarkets whereas 7% bought from both open-air and people selling foods. This is because most foods were available locally in the open-air markets and they have fair prices than those sold in the supermarkets. Three percent never bought food because they depended wholly on well-wishers and therefore did not know the place where the food was bought from.

#### 4.3.4 Consideration by People Giving Food

This item sought to determine how often the respondents' food preferences were considered by those giving them or buying for them food.

Table 8: Elderly's food preferences as considered by those giving/buying them food

Persons giving out food	Always considered (%)	Sometimes considered (%)	Never considered (%)	Never given food (%)
Husband/Wife	3	6	1	90
Children/Friends	2	9	12	77
Well-Wishers	2	2	3	93

N=90

Ninety percent of the respondents were never given food by their spouses because they were staying away from them, whereas 77% were not given food by their children and friends. Ninety three percent did not have other people giving them food. From Table 8, 3% of the spouses always considered the other's preferences whereas 6% considered them sometimes (occasionally). Twelve percent of the respondents' children and friends never considered their preferences, 9% considered them sometimes (occasionally) and only 2% considered the always. Three percent of the well-wishers never considered the elderly peoples' preferences while 2% considered them always and sometimes (occasionally). The elderly's food preferences were not considered whenever food was given to them.

#### 4.3.5 Food Preferences

Fifty eight percent of the respondents did not buy food according to their preferences whereas 34% bought according to their preferences. The main reason given for not buying the desired food was lack of money. Some gave reasons like

dental problems therefore making them unable to eat what they may desire. Eight percent of the people did not buy food for themselves and therefore did not have much of a choice.

#### **4.3.6 Foods Preferred**

Thirty eight percent of the respondents preferred to eat cereals and vegetables mainly because they are cheap. Sixteen percent preferred cereals and animal foods while 22% preferred vegetables, cereals and animal foods. Convenience foods were preferred by only 5% of the respondents. This could probably be because convenience foods are expensive. A food frequency questionnaire completed at the sisters of Tharbes project in Kibera by HelpAge International showed that plant sources formed the greater part of the elderly's diet, cereals being the main sources of their diet (HelpAge, 2000). Fruit consumption was low and that low income was an impediment to proper nutrition. It also revealed that food preferences were not met and that due to poverty, there were other competing needs for the limited income.

#### **4.3.7 Likes and Dislikes of Specific Food Items**

This item sought to find out how many respondents liked/disliked a particular food item in spite of their ability to purchase the food. Table 9 gives the percentages of degree of like/dislike of the food items. The most liked food items in descending order were: tea, beef, milk, oranges, bananas, beans, chicken, cabbage, irish potatoes and *sukuma wiki*. The least liked foods were coconut, coffee, fish and groundnuts.

Table 9: Respondents' degree of like/dislike of food items

Food Item	Like (%)	Neutral (%)	Dislike (%)	Total (%)
<i>Ugali</i>	76	22	2	100
Porridge	73	21	6	100
Rice	57	34	9	100
Irish potatoes	83	13	4	100
<i>Chapati</i>	79	18	3	100
Beans	87	9	4	100
Peas	72	10	18	100
Groundnuts	48	16	36	100
Coconuts	36	11	53	100
<i>Sukumawiki</i>	83	9	8	100
(Kales)				
Cabbage	84	12	4	100
Oranges	88	11	1	100
Bananas	86	13	1	100
Beef	94	4	2	100
Chicken	85	9	6	100
Eggs	77	14	9	100
Fish	60	2	38	100
Milk	93	3	4	100
Tea	96	1	3	100
Cocoa	64	16	20	100
Coffee	46	14	40	100
<i>Githeri</i>	73	10	17	100
Pigeon Pea	71	8	21	100
<i>Muthokoi</i>	60	19	21	100

N = 90

#### 4.3.8 Reasons For Preferring Foods Indicated By Respondents

The elderly have varied reasons why they prefer particular types of food and not others. The majority gave financial capability as the main reason why they ate whatever they were eating. They might desire to eat some type of food but because they cannot afford they end up preferring a cheaper substitute. Another reason that was very common is the familiarity of a type of food. Most respondents from Central province of Kenya never liked fish and *Ugali* because they are simply not used to them or they have never eaten them before. Coconut was not commonly liked or consumed because it is unavailable and therefore most people are not familiar with it. Fish was disliked mostly because of its association with some cultural upbringing while coffee was associated with lack of sleep to some.

#### 4.4 Nutritional Knowledge

The nutritional knowledge was tested using two items: functions of various food items and the constituents of a balanced diet.

##### 4.4.1 Functions of Food

The item required the elderly to state the functions of green vegetables, meat/chicken/fish, *ugali/rice/chapati*, and fruits such as oranges or pineapples. It was interesting to note the kind of answers that were given. This probably is because of their low educational level; 50% had primary level education with most of them dropping out at class three or four. They gave various functions, for example, filling the stomach, energy, enjoyment, adding heat to the body, starch, among others. Only 6% knew the functions or rather gave correct answers to this

item. The remaining 94% did not make head or tail of the functions.

#### 4.4.2 Balanced Diet

This item required the respondents to identify a combination of food items that comprised a balanced diet.

Table 10: Elderly persons descriptions of a balanced diet

GROUPS OF FOOD ITEMS	FREQUENCY	PERCENTAGE (%)
<i>Chapati, Sukuma-wiki, Cabbage</i>	22	24
Spinach, Rice, Beef stew	2	2
<i>Ugali, Chicken, Milk</i>	30	34
<i>Githeri, Nduma (Arrow roots)</i>	36	40
	90	100

N = 90

Table 10 shows that only 2% of the respondents could identify a balanced diet. The rest did not know what a balanced diet comprises or entails. It is believed that an individual who is nutritionally knowledgeable will select nutritious foods as opposed to one who is not. However, this is not always the case. Most of the respondents could not afford animal food items because of lack of finances and not knowledge on nutrition.

#### 4.5 Physiological Characteristics

This section sought to find out the physiological changes in the elderly peoples' bodies that may affect effective food selection and intake and therefore the nutritional status.

Table 11: Physiological changes as experienced by the Respondents

Bodily changes	Yes (%)	No (%)	Total (%)
Loss of appetite	68	32	100
Loss of taste	72	28	100
Physical disability	33	67	100
Dental problems	72	28	100
Chronic diseases	52	48	100

N = 90

From Table 11, 68% of the elderly experienced loss of appetite, 72% have taste and dental problems, which may make them, not choose and consume some particular food items. Thirty three percent of the respondents had physical disability while 67% did not have. This can be attributed to the fact that most of them fell under the 55-59 age category and therefore still strong to get their own foods.

#### **4.5.1 Diseases**

Fifty two percent had chronic diseases while 48% did not have any diseases except occasional bouts of malaria, which is common in Kenya. Sixty two percent of the respondents complained of backache; a common problem in old age, and stomachache. A few had diabetes. There was one case with Tuberculosis and one case with liver problems. Some had swollen legs and arms. Others had eye problems and earache. One respondent had a blocked bladder. The presence of chronic diseases, sometimes more than one at a time, can call for modified diets as well as one's energy to perform daily routines. Modified diets are often expensive and difficult to follow, especially if the person does not fully comprehend the situation. Many people experience discomfort with the ingestion

of certain foods. This discomfort may be biophysically based, but more often its cause is psychological (Kart & Manard, 1981).

#### **4.5.2 Bodily Changes**

Ninety percent experienced weight changes (increase/decrease) but most of them reported loss of weight as the main change they had. Weight tends to increase until the early 40s in men and the early 50s in women, to hold relatively steady for the next 15-20 years, and to decrease thereafter (Chernoff, 1991). Four percent had lost height and weight while 3% had lost height only. One respondent had spinal hunch back and weight change whereas one did not have any change yet.

#### **4.5.3 Taste of Sugar and Salt**

Diminished sense of smell and taste caused by declining numbers of taste buds and a number of neurologic problems can affect appetite. Diminished sense of taste can lead to over-seasoning of foods. This can irritate other sensitive parts of the digestive tract and in the case of salt, contribute to hypertension, heart disease, and kidney malfunction (Kart & Manard, 1981). Thirty eight percent of the respondents had problems with the taste of sugar and salt while 62% did not have any problems with the taste of sugar or salt. This could be due to age factor. Most of the respondents were in the group of the young old and therefore it is possible that they had not started experiencing such problems and specifically with salt and sugar.

#### 4.6 Psychological Factors

Various psychological factors affecting the respondents' choice of food items were investigated. Table 12 shows the responses.

Table 12: Psychological factors affecting the elderly persons' choice of food

Type of information	Always(%)	Sometimes(%)	Never(%)	No choice(%)
Foods in season	30	27	39	4
Foods preferred by friends or peers	7	9	79	4
The nutritive value	26	24	46	4

N = 90

The place where the item is bought from did not matter much to 38% of the respondents while 36% always considered the place they bought their foods from. Twenty two percent considered this issue at times and not others. The cost of food always influenced decisions made by 64% of the respondents on food choice, 21% considered or were influenced by the cost at times while 11% did not bother about the cost. This could be due to the fact that the majority earn very little if any and so the cost had to be considered before purchasing.

Thirty nine percent never bought foods in season, 27% did so at times, while 30% always made use of the foods in season. Seventy nine percent were never influenced by their friends/peers on food choices especially due to lack of money. Whatever they had at the time of visitation is what they shared. Nine percent sometimes chose what their friends/peers prefer, while 7% always had to consider this issue. The nutritive value of the food never influenced 46% of the respondents may be because of lack of nutritional knowledge and lack of money

to buy nutritious foodstuffs, 24% sometimes considered this issue while 26% always considered it when buying/choosing food items. Four percent had no choice whatsoever in all cases because they entirely depended on well-wishers.

#### **4.6.1 Loneliness**

Loneliness affected 63% of the respondents' way of acquiring food, whereas 37% were not affected. Most of those affected were widows and widowers and those whose spouses were staying upcountry. They usually felt little desire for food. The elderly person who feels rejected or neglected by his/her family and friends will often use food as an attention-getting device. Loneliness and social isolation powerfully affect food intake. Some older adults have lost their loved ones, live far away from their children, or are neglected by their relatives. They often have little desire to prepare meals and may eat only those foods that are conveniently available. Others eat compulsively to assuage their feelings of loneliness, depression and despair. Erratic eating habits in turn perpetuate the mental depression (Kart and Manard, 1981).

#### **4.6.2 Bereavement**

Bereavement affected 30% of the respondents while 70% were not affected. This could be due to the fact that only 22% were widowed. Majority of the respondents fell in the age group of 55-59 years and most of them had not lost their spouses and many of their children. The adjustment to loss of one's mate is difficult and can be the source of major dietary stress. Aside from the financial and management problems related to the loss of mate, the loss of companionship can seriously affect one's motivation to shop, cook, eat, remain active, or in some

cases go on living. This loss of a companion may reduce physical activity or social participation that had previously diverted attention from many of the problems associated with old age (Kart & Manard, 1981). This was the case with majority of bereaved respondents in the study.

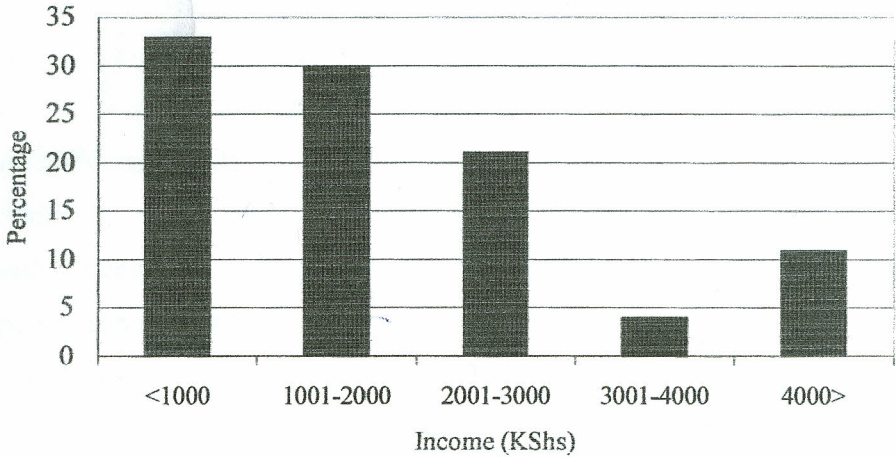
#### **4.7 Socio-economic Characteristics**

The factors looked into were income, sources of income, leisure time, cooking facilities, means of transport to the market/buying place, where food item is bought and cost of the item/food.

##### **4.7.1 Income**

Income is a primary factor in determining diet at any age. Income is greatly reduced in old age. Many elderly shoppers cannot buy food on the basis of past food habits or optimal nutrition because of lack of buying power. Expenditures for food must compete with other necessary expenditures such as rent and utilities. Thus, there may be a tendency for the elderly person to purchase cheaper foods higher in carbohydrates rather than the more expensive, protective foods such as meat, fruit and vegetables (Kart & Manard, 1981).

Thirty three percent got a monthly income of a thousand and below whereas 30% got between 1001-2000. Twenty one percent got between 2001-3000, 4% got 3001-4000 while 11% got 4000 and above. One respondent did not have any source of income at all and relied on handouts. The respondents' income is presented in Figure 2.

**Figure 2: Elderly persons' income**

Income influences food selection and consumption because people cannot eat what they cannot afford. Income therefore, is a potent factor in determining how much and what kind of food will be available. People who have a high income are expected to spend more on food, while those with a low income are expected to spend a higher percentage of their income on food. This is in accordance with findings of Central Bureau of Statistics (1977 & 1992). The higher the total monthly income, the lower the percentage of this income spent on food and vice versa. This is because those with higher income have more funds to meet other needs while those with low income have to forego other needs for the sake of food (Central Bureau Statistics, 1992).

#### 4.7.2 Sources of Income

The sources of income were investigated and the findings are given in Table 13.

Table 13: Elderly persons' sources of income

Source	Frequency (f)	Percentage (%)
Business	38	43
Security	13	14
Help from children/friends	9	10
Manual work	13	14
Traditional medicine	4	4
Sale of personal property	2	2
Professional worker	3	3
Farming	2	2
House rent	2	2
None	4	4
Total	90	100

Forty three percent earned their living from doing small businesses ranging from selling vegetables and household goods to selling charcoal and firewood. Fourteen percent were watchmen and these were the young old men, 10% got help from their children and friends and organizations while 14% were doing manual work ranging from washing peoples' clothes and houses to construction work. Three percent did professional work like teaching and driving, 2% got their income from house rent and business and another 2% were farmers. Four percent were traditional doctors whereas 2% sold their personal property. Four percent of the respondents did not have any regular source of income and therefore depended on hand-outs from well-wishers. A number of respondents did not rely on their present occupations for income. For instance, two social workers and a pastor had business as their source of income.

### 4.7.3 Leisure Time

Table 14 presents the activities the elderly engaged in during their leisure time.

Table 14: Elderly persons' use of Leisure Time

Activity	Frequency (f)	Percentage (%)
Resting and sleeping	27	30
Visiting and sleeping	16	18
Visiting children/friends	16	18
Church and visiting	16	18
Going to church	6	7
Attend meetings	2	2
Sports	3	3
Total	90	100

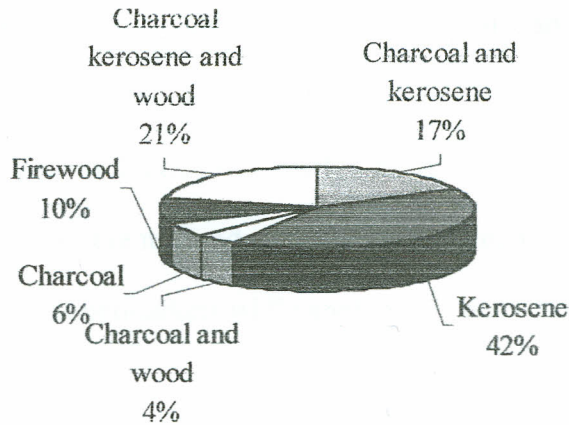
The majority (30%) spent their free time if any, resting and sleeping, while 18% used it for visiting and sleeping, visiting friends and children, and visiting and going to church each. Seven percent used it for going to church, 2% for going to church and other meetings and 4% attended meetings like self-help groups, community meetings and traditional dances. Three percent used their leisure time for sports so as to keep fit. However, the respondents expressed lack of enough free time because they were busy looking for ways and means of feeding their many dependants.

### 4.7.4 Cooking Facilities

The cooking facilities available may affect the type of food one chooses depending on the fuel one uses. For instance one may want to bake but due to lack of an oven one may not consume what one wants to. Some of the respondents

expressed a liking for *Githeri* (boiled Maize and beans) but because of lack of fuel they could not consume it and, therefore, had to choose another type of food that cooks faster and uses less fuel. Lack of adequate cooking facilities may be a problem for those living in many kinds of low-cost housing. Results of the types of fuel used are shown by Figure 3.

**Figure 3: Cooking fuel**



Most respondents (42%) were using kerosene stoves only probably because they are faster and convenient as compared to charcoal because most of the elderly work late into the evening, while 17% combined charcoal and kerosene due to the cost. Charcoal is much cheaper than kerosene and the respondents preferred using especially when cooking foods that take long to cook. Twenty one percent were using charcoal, kerosene and firewood, when there was no money to buy the more expensive kerosene and charcoal, while 10% used firewood only because it is much cheaper and it is locally available from the nearby Karura forest. Six percent used charcoal only whereas 4% combined charcoal and wood. Nobody was using gas or electricity to cook though some of them were living in houses with electricity. They were using whatever was

available at a particular time and not just sticking to one specific fuel save for those with a regular income.

#### **4.7.5 Means of Transport**

The distance to the market place and the means of transport can affect the type of food one chooses to take. The elderly are often forced to shop at more expensive stores or shops. This situation may be caused by the absence of chain stores or supermarkets in their neighbourhood or lack of transportation to the volume sales, chain stores or markets with their lower prices. Since most of the people in Mathare relied on the open-air market nearby, they went to the market on foot. Therefore, 96% of the respondents went to the purchasing place on foot, 2% used *Matatus* to the supermarkets while another 2% used bicycles.

#### **4.7.6 Where Item is Bought**

Thirty eight percent were never affected in their choice of food by the place where the item was bought, whereas 36% were always affected by this factor. Twenty two percent were affected by this factor sometimes while 4% did not choose food for themselves therefore this factor did not affect them.

#### **4.7.7 Cost of the Item/Food**

Sixty four percent were always affected by the cost of food in their choice of food items, while 21% were affected sometimes and 11% were never affected by this factor. Four percent did not choose food for themselves. The cost of food will always affect the food that one chooses.

## **4.8 Satisfaction/Dissatisfaction Characteristics**

The majority of the respondents (87%) were satisfied with the food in the market. Thirteen percent were not satisfied with the availability of foods in the market for their use.

### **4.8.1 Need for Modifications**

Fifty one percent of the respondents expressed a need to make some specific modifications on the availability of food to the elderly while 47% did not need any modifications. Two percent were not purchasing any food for themselves and therefore did not need any modifications. Though most respondents were satisfied with the availability they expressed a need to modify a few parameters to improve the situation in the market.

### **4.8.2 Specific Modifications**

Forty two percent of the respondents were satisfied and did not need any modifications on the foods available in the market while 29% wished that the cost of food could reduce to make it affordable since they earn very little from the odd jobs they do. Eight percent expressed a need to provide variety, 6% wished that the standards of hygiene could improve and another 6% wished that both the cost and more variety could be improved. Four percent wanted the food to be accessible to them since they had physical disability that could not allow them to get the foods from the market, while 2% wished that more fresh foods could be brought to the market than it is the case now. Another 2% wished that stalls could be built so that food items are not spread on the ground, as is the case so as to improve the hygienic standards.

#### 4.9 Food Frequency

The frequency with which a food item is consumed may directly or indirectly reveal the extent to which that food is liked or disliked. It is therefore, assumed that the more frequently a food is consumed, the better it's preference. However, this may not always be the case as sometimes, foods not liked may be consumed frequently. This is normally seen among the low-income earners who despite their preferences for certain foods may not be able to afford them.

Results in Table 15 indicate that foods consumed once a day or more than once a day by most respondents include tea (80%), *sukumawiki* (kale) (62%), *ugali* (60%), cabbage (48%), and potatoes (40%). Other foods eaten regularly (several times a week) include *githeri* (41%), potatoes (38%), *ugali*, beans and porridge (33%) each and oranges and bananas (32%). Foods consumed once a week include porridge (42%), rice (31%), *Muthokoi* (29%), *Chapati* (28%) and *Mukimo* (27%). Foods consumed once or twice a month, were chicken (47%), *chapati* (39%), beef and peas (28%) each, eggs (26%) and *Jogo* (pigeon peas) (24%). Foods that were rarely or never consumed include coconut (71%), coffee (58%), groundnuts (42%), fish (40%), chicken and cocoa (37%), peas and *mukimo* (29%) each and eggs (26%).

Data presented in table 9 indicates that a considerable percentage of people rated coconut, fish, groundnuts, coffee and cocoa as disliked. Coconut and fish are unfamiliar to most people who are not geographically advantaged by the availability of these foods. Many people because of dental problems and unfamiliarity, did not consume groundnuts. In fact some respondents from Central

were saying it is for people from Western Kenya. Coffee and cocoa are generally expensive beverages and are inaccessible to most Kenyans. This explains why most people (80%) consumed tea frequently (once a day or more).

Chicken, though rated by most people (86%) as liked, was consumed rarely or never consumed by a considerable number of people (37%). This could be explained by the fact that, chicken is very expensive in Nairobi and cannot be afforded by most people. Thirty two percent and 26% of the respondents rarely or never consumed milk and eggs respectively because they said they are expensive.

Most respondents only took milk in tea. Peas and pigeon peas were rated as rarely or never consumed by a good number of people, 29% and 36% respectively because they said they are expensive and inaccessible.

Thirty nine percent and 29% of the respondents rarely or never consumed *Muthokoi* and *mukimo* respectively because these are traditional foods familiar to people from Central and Eastern provinces of Kenya. Most respondents from Western Kenya were not familiar with these dishes and therefore never consumed them.

The intake of the respondents can be categorized as follows:

- Cereals – High
- Animal proteins -Low
- Vegetables and Fruits – Medium

Table 15: Frequency with which food items were consumed by elderly persons in Mathare.

Food items	Once/more than once a day (%) <b>High</b>	Several times a week (%) <b>Medium</b>	Once a week (%) <b>Medium</b>	Once/twice a month (%) <b>Low</b>	Never (%) <b>Low</b>
<i>Ugali</i>	60	33	4	2	1
Rice	10	27	31	21	11
Irish Potatoes	40	38	12	7	3
<i>Chapati</i>	9	12	28	39	12
Beans	31	33	17	12	7
Peas	7	16	20	28	29
Groundnuts	11	12	14	21	42
Coconut	6	1	2	20	71
<i>Sukumawiki(Kales)</i>	62	24	4	2	8
Cabbage	48	29	12	8	3
Oranges	20	32	24	13	11
Bananas	11	32	20	21	16
Beef	14	24	24	28	10
Chicken	1	2	13	47	37
Eggs	7	19	22	26	26
Fish	10	22	16	12	40
Milk	28	19	14	7	32
Tea	80	11	4	2	3
Coffee	14	4	11	13	58
Cocoa	13	10	20	20	37
<i>Githeri</i>	18	41	21	4	16
Porridge	14	33	42	8	3
<i>Muthokoi</i>	2	21	29	17	31
<i>Mukimo</i>	7	20	27	17	29
Pigeon Peas	4	12	23	24	37

N = 90

Foods taken once or several times a day were classified as high intake, several times a week or once a week was medium, whereas once or twice a month or never were classified as low (see Appendix 1).

#### **4.10 Foods Forbidden from Respondents**

In some cases, a person may be forbidden from eating some foods for medical reasons. However, most respondents (80%) were not forbidden from eating any food but they decided not to eat particular foods because of health problems. Some of them did not take coffee or cocoa because they had chest problems. There was one diabetic case that could not eat most of the starches. Others could not eat *Githeri*, *Muthokoi* and groundnuts because of dental problems. Culture did not interfere with the respondents like or dislike though unfamiliarity of certain foods to particular ethnic groups made them not consume the food. For example, fish was not familiar to people from Eastern and Central provinces and therefore most of them never consumed it. Coconut is only available at the coast and most respondents (71%) rarely or never consumed this food item.

#### **4.11 Food Storage and Preparation**

This section investigated the methods used to prepare and store food by the respondents. The length of time food was stored and the storage facilities were investigated. The length of time food was prepared by handling, washing or cooking was also looked into.

#### 4.11.1 Length of Storage Time for Foodstuffs

Some foods may deteriorate when stored for long and thereby lowering their nutritive value. For example vitamin C, which is plenty in fruits and vegetables, is very volatile and deteriorates due to oxidation if stored for long.

Table 16 : Length of time taken by the elderly persons' to store foodstuff

Food item	1 day (%)	2 days (%)	1 week (%)	1 month (%)	Don't store (%)
Vegetables	50	20	-	-	30
Fruits	20	10	-	-	70
Eggs	10	6	-	-	84
Meat	13	-	-	-	87
Maize and beans	7	21	30	18	24

N = 90

Most of the respondents did not have enough food to eat or store. So, most of them actually did not buy any extra food that could be stored. They only bought what they could consume and finish for that meal. Fifty percent of the respondents stored vegetables for a day while 20% stored food for 2 days. Nobody stored vegetables for a week or a month while 30% did not buy extra vegetables. They only bought when it was needed for a single meal. Twenty percent of the respondents stored fruits for a day, 10% stored for 2 days and none stored for a week or a month. Seventy percent could either not afford fruits or they bought and consumed it immediately.

Meat was stored for a day by 13% of the respondents while none stored it for 2 days or more. Most of them (13%) stored it cooked. Cereals were stored for a longer time probably because some respondents got maize and beans from

upcountry. Seven percent stored them for 1 day, 21% stored for 2 days, and 30% for a week and 18% for a month.

#### 4.11.2 Storage Facilities

The elderly are not often able to take advantage of sales or quantity discounts because they lack proper storage facilities, including refrigeration and cupboards. Modern marketing procedures are geared towards the younger consumer and are generally family oriented. The elderly require smaller amounts of food that may be unavailable for sale, or if available more expensive. Small quantities are especially important for those living alone and those with storage problems (Kart & Manard, 1981). The respondents were asked how/where they stored various types of foods and their responses are shown in Table 17.

Table 17: Elderly persons' storage facilities

Storage Facility	Frequency (f)	Percentage (%)
Polythene bags	63	70
Cupboards/shelves	16	18
Tins/pots/buckets	11	12
Total	90	100

Majority (70%) of the respondents stored their foods in polythene bags. This could be because the items are packed in these bags from the market. Eighteen percent stored them in the cupboards or structures with shelves, 12% in tins /pots/buckets. Most of these used empty cooking fat containers to store dry ingredients and cereals. Nobody used a refrigerator and this could be because these are low-income people living in the slums. The type of the storage facility

used may contribute a lot to loss of nutrients from food especially volatile nutrients like vitamin C.

#### **4.11.3 Food Preparation**

The stage at which the vegetables and fruits are washed may lead to enormous losses of nutrients. Most respondents (68%) washed vegetables after cutting, while 72% washed fruits before cutting. Thirty two percent washed vegetables before cutting while 28% did not wash the fruits or washed after cutting. This could be explained by the fact that most respondents did not have any nutritional knowledge and therefore may not have been aware of any nutrient loss during washing and cutting of fruits and vegetables.

#### **4.11.4 Length of Time of Cooking/Preparing Food**

The length of time the food is subjected to oxygen and heat may affect the nutritive value of that food adversely. For instance if fruits are cut long before eating time, oxidation may occur and the volatile nutrients may be lost. On the other hand, prolonged cooking of vegetables destroys vitamin C. Long exposure of eggs, meat and fish to heat may harden and coagulate the proteins therefore rendering them indigestible. Ten percent of the respondents cooked vegetables for less than 10 minutes, 63% took 11-30 minutes, 15% cooked them for 31-60 minutes while 12% cooked them for as long as possible (see Table 18).

Table 18: Length of time the elderly persons' take to prepare/cook food

Food item	Less than 10 min (%)	11-30 min (%)	31-60 min (%)	As long as possible (%)	Don't cook/prepare (%)
Vegetables e.g <i>Sukuma-wiki/cabbage</i>	10	63	15	12	-
Fruits	56	24	13	7	-
Eggs	71	12	-	-	17
Meat	-	17	32	51	-
Fish	-	17	32	51	-
<i>Githeri</i>	-	-	11	60	29
<i>Mukimo</i>	-	-	27	34	39
<i>Ugali</i>	-	73	17	-	10

N = 90

Fifty six percent prepared fruits for less than 10 minutes, 24% took 11-30 minutes, 13% spent 31-60 minutes while 7% took as long as possible. The majority of the respondents (51%) prepared meat for as long as possible, 32% took 31-60 minutes while the remaining 17% took about 30 minutes. Fish was not eaten by most of the respondents but 40% took 11-30 minutes to cook it while 19% took 31-60 minutes. Eggs were prepared for less than 10 minutes by 71% of the respondents while 12% took 11-30 minutes. The other 17% were not eating eggs.

Cereals seemed to take as long as possible to cook by the majority of the respondents with an exception of *ugali*. Sixty percent of the respondents cooked *githeri* for as long as possible while 34% cooked *mukimo* for as long as possible. Eleven percent and 27% took 31-60 minutes to cook *githeri* and *mukimo* respectively. The other respondents did not cook *githeri* or *mukimo* either because

of lack of fuel or dental problems. Seventy three percent cooked *ugali* for 11-30 minutes, 17% cooked it for between 31-60 minutes while another 10% did not eat *ugali* and therefore did not know how long they would take to cook it. Nobody took less than 10 minutes to cook meat, fish, *githeri*, *mukimo* or *ugali*.

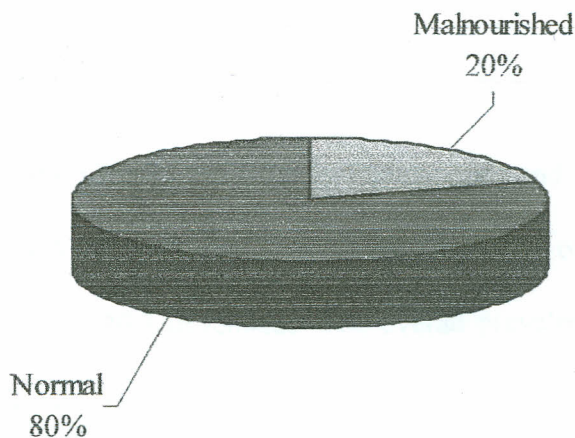
#### 4.12 Nutritional Status

Nutritional status was assessed using MUAC and Body Mass Index (BMI). Anthropometry was conducted for height, weight, armspan, halfspan and MUAC.

##### 4.12.1 MUAC

MUAC can be used as a quick method for nutritional screening in emergencies. Using MUAC cut-off points of 22 cm for women and 23 cm for men, 80% of the respondents were classified as normal whereas 20% were classified as malnourished.

**Figure 4: Nutritional status MUAC**



A study done by Chilima (1998) in rural Malawi showed that 20.4% of the men and 10.0% of the women were malnourished. Another study done by

Tesfaye, et. al. (2000) in Central Ethiopia showed that 35.7% of the elderly are malnourished.

#### 4.12.2 Body Mass Index

BMI is calculated by dividing the weight in kilos by the height in square metres ( $\text{kg}/\text{m}^2$ ). Using the categories given by Ismail and Manandhar (1999), 6.7% were severely malnourished while 24.4% were on the borderline. Using  $18.5 \text{ kg}/\text{m}^2$  as the cut-off point for underweight, 31% of the respondents were malnourished or were underweight, 50% were normal or had adequate nutrition, 13.3% were plump/obese 1, whereas 5.6% were classified as obese 2 (see Table 19).

Table 19: Elderly persons' Nutritional Status using BMI

Nutritional Status	Frequency (f)	Percentage (%)
Severely malnourished	6	6.7
Borderline	22	24.4
Normal/adequate	45	50.0
Plump/obese 1	12	13.3
Obese 2	5	5.6
Total	90	100

Chilima (1998) found out that 36.1% of males and 27.0% of the females had BMI below  $18.5 \text{ kg}/\text{m}^2$ . Tesfaye, et. al., (2000) found out that the mean BMI was 19.9 in males and 20.3 in females. The overall prevalence of under nutrition among the elderly was 30.5%.

### 4.12.3 Descriptive Statistics on Nutritional Status

Table 20 gives a summary of the descriptive statistics of the nutritional status of the elderly in Mathare.

Table 20: Descriptive Statistics on the elderly persons' Nutritional Status

Index	Mean	Standard deviation	Range
BMI	21.14	4.84	32.44
MUAC	26.25	3.81	22.30
Weight	56.98	11.20	54.50
Height	179.71	152.82	148.240

The mean BMI for both men and women was 21.14 whereas mean MUAC was 26.25. This shows that the population was normal or had adequate nutrition using both indices.

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.0 Introduction

This chapter is a summary of the major findings, conclusions and recommendations.

The purpose of this study was to examine the psychological, physiological and socio-economic factors that influence food selection and intake patterns and buying practices among the aged in Mathare. The study also assessed the nutritional status of the elderly in relation to their dietary intake.

The study sought to achieve the following objectives: To determine the nutritional status of the elderly; to determine the food preferences, satisfaction/dissatisfaction with foods available in the market for the elderly; to determine the factors that influence food selection and intake among the elderly; to investigate the nutritional knowledge of the elderly and to establish the dietary intake of the elderly in Mathare slums.

This study was carried out in Mathare slums that is, both Mathare North and Mathare Valley. A sample of 90 elderly people of 55 years and above was used. An interview schedule was used to elicit information from respondents pertaining to the research objectives. Data were analysed by the use of the Statistical Package for Social Sciences (SPSS). Descriptive statistics namely means, frequencies and percentages were used to analyse the data.

### 5.1 Major Findings, Conclusions and Implications

From the findings of this study, it can be generally stated that several factors affect the selection and consumption of food by the elderly in Mathare, which in turn affect their nutritional status. The age, gender, occupation, education and marital status of the respondents were found to influence an individual's food selection and intake patterns. Most respondents were aged between 55-59 years and were married. They had not attained a high educational status and therefore they did odd (casual) jobs and of course they had a low monthly income. Most of them (41%) had 4-6 dependants on their income and this meant that they selected foodstuffs that are relatively cheap and poor in nutritional quality unlike those without dependants and with a higher income. The respondents liked most of the foods provided in the list. However, foods such as fish, coconut, groundnuts, coffee and cocoa were generally disliked. These foods were found to be unfamiliar and therefore disliked due to their inaccessibility in terms of inadequate purchasing power and environmental and cultural reasons.

Generally, most respondents in Mathare could not select and consume certain foods as often as they would like due to inadequate finances and health reasons. These foods mainly include animal foods such as chicken, fish, beef, eggs and milk. Others include the expensive starchy foods such as rice and *chapatis*. Most respondents (70 %) bought food for themselves when money was available. Food was bought from the open-air market within the slums and most respondents went to the market on foot. Generally speaking, the preferences of the elderly were not considered when being given food.

Nutritional knowledge was not found to influence food selection and intake. The respondents in this study could be said to be generally unaware of nutritional information. They were not aware of the various functions of food and a balanced diet. They selected any food so long as it fills the stomach, was cheap and acceptable to their taste.

Most foods listed by the elderly as those they would have liked to eat more often but could not afford include highly nutritious foods such as chicken, beef and milk. This showed that with financial ability they would eat nutritious foods in spite of their lack of nutritional knowledge.

The respondents were undergoing various physiological changes that affected their food selection and intake. Sixty eight percent experienced loss of appetite, 72% loss of taste while some had physical disability and chronic diseases. Majority (72%) had dental problems and many had lost weight.

Some of the psychological factors that affected their food choice and intake include the place where the food was bought, the cost of the food and the foods in season. Foods preferred by friends and peers and the nutritive value did not affect food selection. Most elderly were affected by loneliness and bereavement. Social isolation did not affect their food selection and intake mainly because they are used to the intertribal interactions.

Income was a major determinant of foods selected and most of the respondents (33%) had a monthly income of less than one thousand shillings. Most of them (43%) got this income from small businesses like selling vegetables and charcoal while others did casual jobs.

Leisure time was spent mainly for sleeping and resting and this did not affect food selection and intake. The commonest cooking facility and fuel was the wick/pressure stove and kerosene. Some found it cheaper to combine kerosene with charcoal. Most respondents (96%) went to the market on foot and this affected their food selection because they were not able to travel to sales and big supermarkets which offer a variety of foodstuffs at relatively cheaper prices.

There was a general satisfaction with the availability of foods in the market but the respondents expressed dissatisfaction with the cost of food. Thus, the cost of food affected the quality and quantity of foods selected. There was also dissatisfaction with the standards of hygiene and the variety of foods in the market.

Most respondents did not have food to store but those who could occasionally get some food to store did so for about a day or two. Generally speaking, this cannot adversely affect the nutritive value of the food and nutritional status of the respondents. They did not have sophisticated storage facilities. Those who stored food used polythene bags and this can affect the nutritive value of the food especially if it is stored for long.

Most of them used traditional methods of food preparation and this can alter the nutritive value of the food item. Most of them washed vegetables after cutting them and cooked food for a long time. This means that the nutrients are washed away and destroyed by heat because of prolonged cooking. This can affect the nutritional status of the elderly although the selected food is very rich in nutrients.

Using MUAC the nutritional status can be said to be good because 80% of the respondents were found to be normal. Using BMI 31.1% were found to be underweight.

## 5.2 Conclusions

In view of the research objectives, the following conclusions can be made about the elderly in Mathare slums:

1. The elderly preferred to eat cereals and vegetables mainly because they are cheap as compared to animal foods. They were satisfied with foods available in the market.

2. The factors that influence food selection among the elderly in Mathare include: The cost of the food, income, availability of money, means of transport and availability of familiar foods in the market.

3. Factors that affected food intake include: dental problems, loss of appetite, loneliness, loss of taste and bereavement.

4. Factors affecting the nutritional status include: chronic diseases and the Present occupation of the elderly.

5. The elderly in Mathare did not have any knowledge on nutrition. Most of them were illiterate and did not know the function of various foods in the body or the constituents of a balanced diet.

6. The elderly in Mathare can be said to be of good nutritional status. Using MUAC, 20% were malnourished whereas using BMI, 31% were malnourished. These percentages are below average.

7. The elderly in Mathare did not have food to store and the means of transportation to the market was not a problem. This means that most nutrients were not lost during storage or transportation. They got food from within the estate.

8. Thirty three percent of the respondents had income of a thousand and below. This means that at least they could buy some food however cheap the food was. They could not starve. Most of them had some kind of occupation to eke a living from and others were given food by well-wishers.

9. At least more than 50% of the elderly liked most of the foods listed in the food frequency table. This means that they could eat whatever they found and therefore their nutritional status was not as poor as could be expected.

10. Food frequency – cereal intake was very high whereas vitamins and minerals intake was medium. The intake of animal foods was low. When carbohydrate is taken in excess and the level of activity is low, the extra starch is stored as fat. Because MUAC and BMI were used, this can explain why most elderly were not malnourished due to the higher ratio of weight to height. Fat is stored at the vital organs, under the skin and the upper arm and the researcher was interested in the mid-upper arm to get the MUAC.

11. The following conclusions can be made about the elderly in Mathare as relates to diet and intake:

- ⇒ Plant sources formed the greater part of the diet.
- ⇒ Cereals were the main sources of their diet.
- ⇒ Fruit consumption was low.

- ⇒ Loss of teeth was a problem.
- ⇒ Food preferences were not met.
- ⇒ Low income was an impediment to proper nutrition.

Due to poverty, there were other competing needs for limited income.

### **5.3 Recommendations**

Based on the findings of this study, the following recommendations are made:

- 1) Elderly people especially those living in slum areas should improve on their food selection and intake. For them to do so, there is a need for organizations to create jobs and give elderly people pension so as to raise their monthly income. Only then will they manage to meet the rising cost of foodstuffs. Having an occupation and also being able to carry out income generating activities may ensure that the body is kept active which is key to maintaining functional ability. On the other hand, if older people rely on other relatives for income, they may reduce their own activity and hence their nutrient intake and functional ability may dwindle over time.
- 2) In order to enhance familiarity and therefore acceptance of certain foods such as coconuts, groundnuts, fish, cocoa and coffee, there is a need to physically avail these foods to the elderly by marketing them at affordable prices.
- 3) There is also a need to educate/equip the elderly with nutritional knowledge so that they are aware of the nutritive value of food and

loss of nutrients during storage and preparation. This can be done by NGOs and extension workers.

- 4) There is a need to improve the nutritional status of impoverished elderly people living in slum areas probably by supplementary feeding programmes.
- 5) Some elderly persons should be taken to older people's homes for care and their care givers should be involved in nutrition education programmes.

#### **5.4 Suggestions for Further Research**

Further research could be carried out as follows:

- a) Research on the same topic of this study could be carried out in the rural areas.
- b) Study on the same topic could be carried out using a larger sample by including other slum areas in Kenya.
- c) A study could be carried on to determine the effect of HIV/AIDS on the food selection and the nutritional status of the elderly both in the urban and rural areas.

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## APPENDIX 1: RESPONDENTS' FOOD INTAKE SUMMARY

<b>Food Item</b>	<b>Intake Summary (High/Medium/Low)</b>
<i>Ugali</i>	H
Rice	M
Irish Potatoes	H
<i>Chapati</i>	L
Beans	M
Peas	L
Groundnuts	L
Coconut	L
<i>Sukumawiki(Kales)</i>	H
Cabbage	H
Oranges	M
Bananas	M
Beef	L
Chicken	L
Eggs	L
Fish	L
Milk	L
Tea	H
Coffee	L
Cocoa	L
<i>Githeri</i>	M
Porridge	M
<i>Muthokoi</i>	L
<i>Mukimo</i>	L
Pigeon Peas	L

## APPENDIX 2: INTERVIEW SCHEDULE

Factors affecting food selection and the Nutritional Status of the elderly in Mathare Slums.

Hello,

My name is Evelyn Makori. I am a post-graduate student at Kenyatta University in the Faculty of Home Economics. I am carrying out a study on food selection patterns of the elderly and their nutritional status in Mathare. The purpose of this study is to determine the factors affecting food selection and how this in turn affects the nutritional status of the elderly.

All elderly people who have attained the age of 55 and above living in Mathare were chosen to participate in this study and you are one of those who have been selected to be interviewed. Some measurements will also be taken if you don't mind. Your response will be treated with utmost confidentiality and will be used for the sole purposes of making recommendations on food selection and consumption for the elderly and their caretakers. Results of the study will be made available to any interested respondent.

Thank you for your co-operation.

Section A: Demographic Information:

1. Gender:
  1. Male
  2. Female
2. In which of the following age categories do you belong?
  1. 55-59 years
  2. 60-64 years
  3. 65-69 years
  4. 70-74 years
  5. 75 years and above
3. What is your marital status?
  1. Married
  2. Never married
  3. Separated
  4. Widowed
  5. Divorced
4. What is your highest education level?
  1. No education
  2. Primary education
  3. Secondary education
  4. Training (Specify) \_\_\_\_\_
  5. University \_\_\_\_\_
5. How many people within your household are dependent on your income excluding yourself?
  1. None
  2. One
  3. Two-three
  4. Four and above
6. What was your occupation in your early years?
  1. Skilled worker
  2. Unskilled worker
  3. Professional (Specify) \_\_\_\_\_

4. Any other (Specify) \_\_\_\_\_ [ ]
7. What is your present occupation?
1. Home maker [ ]
2. Selling in a kiosk [ ]
3. Taking care of grandchildren [ ]
4. Any other (Specify) \_\_\_\_\_ [ ]

Section B: Food Preferences and acquiring practices

8. How do you acquire your food?
1. Buy for yourself. [ ]
2. Bought by children [ ]
3. Bought by wife/husband [ ]
4. Given by children or friends [ ]
5. Bought/given by others (Specify) \_\_\_\_\_ [ ]
9. How often are your food preferences considered when food is purchased for you by the following?

	Always (3)	Sometimes (2)	Never (1)
Husband/Wife			
Children/friends			
Others (Specify)			

10. (a) When you buy your food, do you buy according to your preferences?
1. Yes [ ]
2. No [ ]
- (b) If not, why? \_\_\_\_\_
11. (a) What foods do you prefer to eat? (Tick where appropriate).
1. Vegetables [ ]
2. Fruits [ ]
3. Cereals [ ]
4. Snacks [ ]
5. Proteins e.g. meat, fish, chicken [ ]
6. Convenience foods e.g. (pasta, mandazi, tinned foods, bread, etc. [ ]

7. Any other (specify) \_\_\_\_\_ [ ]

(b) How would you rate the following foods in terms of preferences on the scale below?

Food Items	Like (3)	Neutral (2)	Dislike (1)
Ugali			
Rice			
Potatoes			
Chapati			
Beans			
Peas			
Groundnuts			
Coconuts			
Sukuma wiki (kales)			
Cabbage			
Oranges			
Banana			
Beef			
Chicken			
Eggs			
Fish			
Milk			
Tea			
Cocoa			
Coffee			
Others (specify)			

(c) Please give the main reasons for preferring the foods you have indicated above.

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

12. What are the functions of the foods listed below:

FOOD	FUNCTION
1. Green vegetables	
2. Meat/Chicken/Fish	
3. Ugali/Rice/Potatoes	
4. Fruits e.g. oranges, pineapples	

(b) What group of foods listed below make a balanced diet?

1. Chapati, Sukuma wiki, Cabbage [ ]
2. Spinach, Rice, Beef stew [ ]
3. Ugali, Chicken, Milk [ ]
4. Githeri, Nduma (Arrow Roots) [ ]

13. How often do you buy/are given foods?

1. When money is available [ ]
2. When necessary [ ]
3. Occasionally [ ]
4. Any other time (Specify) \_\_\_\_\_ [ ]

14. Where do you buy your foods from?

1. Open-air markets [ ]
2. People who sell food from house to house [ ]
3. Supermarkets [ ]
4. Farms [ ]
5. Any other (Specify) \_\_\_\_\_ [ ]

### Section C: Physiological Characteristics

15. Do you experience or have any of the following situations/Problems?

1. Loss of appetite Yes [ ]  
No [ ]
2. Loss of taste Yes [ ]  
No [ ]
3. Physical disability Yes [ ]



- |                     |     |     |
|---------------------|-----|-----|
|                     | No  | [ ] |
| c) Social isolation | Yes | [ ] |
|                     | No  | [ ] |

Section E: Socio-Economic Characteristics

17. What is the category under which your monthly income falls?(Tick appropriately).

- |                              |     |
|------------------------------|-----|
| 1. Below 1000 kshs.          | [ ] |
| 2. Between 1001-2000 kshs.   | [ ] |
| 3. Between 2,001-3,000 kshs. | [ ] |
| 4. Between 3001-4000 kshs.   | [ ] |
| 5. 4001 and above.           |     |

18. What are your present sources of income? (Tick those that apply).

- |                              |     |
|------------------------------|-----|
| 1. Retirement benefits       | [ ] |
| 2. Business                  | [ ] |
| 3. Sale of personal property | [ ] |
| 4. Dowry                     | [ ] |
| 5. Help from children        | [ ] |
| 6. Help from organizations   | [ ] |
| 7. Any other (Specify)_____  | [ ] |

19. How do you spend your leisure time? (Tick appropriately).

- |   |     |
|---|-----|
| 1. Going to Church and Church organizations       | [ ] |
| 2. Traditional dancing                            | [ ] |
| 3. Visiting friends, children and other relatives | [ ] |
| 4. Community meetings                             | [ ] |
| 5. Self-help groups                               | [ ] |
| 6. Resting/Sleeping                               | [ ] |
| 7. Any other (Specify)_____                       | [ ] |

20. What kind of cooking facilities do you have? (Tick appropriately)

- |                        |     |
|------------------------|-----|
| 1. Gas/electric cooker | [ ] |
| 2. Wick/pressure stove | [ ] |
| 3. Charcoal burners    | [ ] |

4. The stones/open fire [ ]
5. Any other (Specify) \_\_\_\_\_ [ ]

21. What are the means with which you get to the purchasing place  
(Means of transport)? (Tick appropriately).

1. On foot [ ]
2. Bicycle [ ]
3. Matatu [ ]
4. Own car [ ]
5. Any other (Specify) \_\_\_\_\_ [ ]

Section F: Satisfaction/Dissatisfaction Characteristics.

22. Do you feel satisfied with the foods available in the market for your use?

1. Yes [ ]                      2. No [ ]

23. (a) Do you think specific modifications need to be done on the availability of  
food to                      the elderly?

1. Yes [ ]                      2. No [ ]

(b) If Yes, what should be done in your opinion?

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Section G: Food Storage and Preparation

24 (a) For how long do you store the following foodstuffs before  
cooking/eating?

Food item	1 day	2 days	A week	A month
Vegetables				
Fruits				
Eggs				
Meat				
Fish				
Cereals				

(b) Where do you store the foods listed above?

1. Polythene bags
2. Cupboards
3. Tins/pots/buckets

## 4. Refrigerator

25. (a) When do you wash vegetables?

1. Before cutting

3. After cutting.

(b) For how long do you prepare/cook the following food items?

Food Item	10 min	30 min	1 hour	As long as possible
Vegetables e.g <i>sukumawiki</i> and Cabbage				
Fruits				
Eggs				
Meat				
Fish				

Section H: Nutritional Status Assessment26. Anthropometric Assessment:

Measurement	1st reading	2nd reading	Averages
Height			
Weight			
MUAC			
Armspan			
Halfspan			

27. Food Frequency Questionnaire.

For each food item, indicate with a check mark the category that best describes the frequency with which you usually eat that particular food item.

Food items	Once a day/more than once a day (5)	Several times a week (4)	Once a week (3)	Once or twice a month (2)	Never (1)
Ugali					
Rice					
Potatoes					
Chapati					
Beans					
Peas					
Groundnuts					
Coconut					
Sukuma-wiki (Kales)					
Cabbage					
Oranges					
Bananas					
Beef					
Chicken					
Eggs					
Fish					
Milk					
Tea					
Coffee					
Cocoa					
Others (specify)					

(b) Are there any foods that you are forbidden from taking? Which ones are they?

---

(c) What reasons are given for forbidding you from eating the food?

---



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Thank you