FACTORS THAT INFLUENCE NON COMPLIANCE TO PRESCRIBED DIABETIC REGIMENS IN THE MANAGEMENT OF DIABETES: A CASE STUDY OF KENYATTA NATIONAL HOSPITAL

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DECLARATION

I, Emily Sakwa, hereby declare that this thesis is my own original work and has not been presented for a degree in any other University.

Date 13-9-96       Sign [Signature]

and Elizabeth O. Sakwa, and the late John O. Sakwa.

Although we did not have time to say goodbye, you are only leaving now.
DEDICATION

For my parents Augustine Sakwa
and Elizabeth O. Sakwa, and for the late John O. Sakwa;
Although We did not have time to say goodbye, you are only
a thought away.

I would like to thank the Simala Medical College Clinical
Research Committee for their understanding during my stay
at the hospital and especially Dr. O. Ogunjumi, the Secretary
of the Committee.

As for my parents, I cannot sufficiently express my
appreciation. God bless you and many thanks.
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ABSTRACT

Prior to the research period, observations at the Kenyatta National Hospital wards indicated a marked increase in cases of diabetic patients being admitted because of complications of Diabetes Mellitus. The complications were mainly due to the patients failure to comply to their prescribed diabetic regimens.

The fundamental principal underlying the management of Diabetes Mellitus is the balancing of energy expenditure with nutritional sources of energy under the influence of insulin and other hormonal factors and this gives the base as to why prescribed regimens are used in the control of the disorder.

The study investigated the influence of Socio–economic, cultural and demographic factors on a patients degree of compliance to their prescribed diabetic regimens. Barriers limiting change to these regimens were identified and the diabetic counselling which patients received from the hospital counsellors was assessed. This was because the effectiveness of the counselling services rendered could only be graded as effective when the patients put into practise the advice given. A total of sixty diabetic patients and eight nutrition counsellors participated in the study.

Results indicated that regimen compliance by diabetic patients at Kenyatta National Hospital could generally be documented as good. Though nutrition counselling for the diabetics was issued in good time a serious inadequacy in the
way it was carried out was noted due to lack of necessary materials to carry out the counselling. The diet sheets issued did not reflect the wide variety of staple foods most communities use in their day to day diets in Kenya.

It was recommended that diabetic regimen counselling should be decentralised from Kenyatta National Hospital which is a referral hospital to more easily accessible areas like Health Centres and the District Hospitals. Another recommendation was that more indigenous foods be added to the diet sheets.
LIST OF ABBREVIATIONS

1. USA  United States of America
2. NIDDM  Non Isulin Dependant Diabetes Mellitus
3. IDDM  Insulin Dependent Diabetes Mellitus
4. KNH  Kenyatta National Hospital
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CHAPTER ONE

1.0 INTRODUCTION

Of the serious metabolic diseases of man, Diabetes Mellitus appears to be the most common. Jackson and Vinnick (1977) explained the seriousness of the disorder when they stated that the disorder occurred in every race, at every age and is never cured. Tuomilehto and Wolf (1987) claimed that the disorder was one of the most chronic non-communicable diseases that have increased markedly in this century.

The commission of Diabetes in 1975 reported that diabetes was a major health problem affecting as many as ten million Americans. Joslin's Diabetes Manual (1978) showed that the prevalence of diabetes in the U.S.A. increased by more than 50% between 1965 - 1973 and more than 5% of the population were affected. By 1974 more than 600,000 new cases of diabetes were diagnosed and it was predicted that the incidence of diabetes would double in every 15 years. Guthrie and Guthrie (1982) estimated that 6.1 million Americans were already suffering from this serious incurable disorder by 1980! This revelation does apply to many continents and countries and it can be noted with conviction that Diabetes Mellitus is very much on the increase.

Chea and Yeo (1982) estimated the world population to be about 4,258 million people. Out of these 2,461 million live in Asia and 442 million live in Africa, comprising 68.2% of the total
world population. They gave the estimate that 150 million people in the world suffer from Diabetes Mellitus. This then gives an indication that the problem may be of major importance in Asia and Africa. Mngola (1982) in his paper 'Diabetes Mellitus in the African Continent' claimed that the incidence of the disease was estimated between 1-2% but hard data in this area is scarce.

The last random stratified preliminary Nairobi City Council Survey carried out, proved Diabetes Mellitus was common (Mngola 1983), but there was lack of epidemiological data pertaining to diabetic mortality and morbidity and this made it difficult to assess accurately the extent of the disease in Kenya.

Abdulla (1976) said that by 1966 the magnitude of the problem, Diabetes Mellitus, had become sizeable enough to necessitate the starting of a diabetic clinic at Kenyatta National Hospital wholly devoted to the problem. By 1975, 1,660 patients were registered suffering from the disorder and by 1977 the number had increased to 2,405 patients. Onyango (1982) reported the staggering figure of 4,000 patients and it should be noted that the figure excluded diabetic children attending clinic at the same hospital as they were followed up separately in the paediatrics clinic. This frightening statistic calls for an all out national effort to combat this disease as there could be many more who have the disease but they have not sought treatment. There could be many more undiagnosed cases in the
The fundamental principle underlying the management of Diabetes Mellitus is the balancing of energy expenditure with nutritional sources of energy, under the influence of insulin and other hormonal factors. This brings into light the importance of diet in controlling the disorder. 'Man has always attached significance to food as an agent which could cause, cure or even prevent disease' (Fairfax and Robinson; 1949). Research indicates that treatment of Diabetes Mellitus involves some type of dietary modification (Luean and Taylor, 1983; Jones, Shainberg and Byer, 1978) and depending on the severity of the disorder one of the three diet regimens may be selected.

a) Diet alone
b) Diet and oral hypoglycaemic drugs
c) Diet and insulin

It must be stressed that proper dietary management is the most important factor in the practical management of Diabetes Mellitus. It is virtually important that the diabetics have a fair and unclouded picture of the relationship food has to their disease. If the diabetics are not clear about the current rationale behind basic principles regarding their diet in general they cannot successfully or comfortably be in control. It is important to note that the diabetic diet recommendation is not something that is set 'in concrete', it requires flexibility and the principles of good diet therapy should be utilised to meet
the patients' changing needs.

The study looked at factors which hindered compliance to proposed diabetic regimens because the average diabetic who takes conscientious care of his/her disease under careful medical supervision can often live as long as his/her non-diabetic contemporary.

1.1 BACKGROUND INFORMATION

'the myth that existed in the past that Diabetes Mellitus was rare among the Africans is no longer true. In fact Diabetes Mellitus is just as common, if not commoner in Africa as in Europe or Asia'. (Mngola, 1982: p. 3).

The disease Diabetes Mellitus is rapidly achieving alarming proportions in the country and since it cannot be cured or even prevented sometimes, there is a great need to know the methods which can be used to control it.

Abdulla (1978) gave a statistic of an average of thirty patients being enrolled at the diabetic clinic at Kenyatta National Hospital (KNH) monthly, a rate of one patient a day. According to Mngola (1982) an average of 3-5 cases were being seen weekly at the same hospital. Gicheru (1978) who studied 40 Juvenile diabetics in the hospital stressed that these patients only formed 11% of the total juvenile diabetic population in the
hospital and 1.7% of the total population of diabetics registered in the hospital. It can no longer be said that Diabetes Mellitus is rare as the mentioned statistics exclude patients attending clinic in the other provincial and private hospitals, those seeking help from herbalists and those not yet diagnosed as suffering from the disorder.

Research shows that there has been a low rate of complications of Diabetes Mellitus amongst Africans. Onyango (1982) refuted this by explaining that the low incidence of the frequency of complications of Diabetes Mellitus amongst Africans could be due to the high mortality rate amongst patients, especially those suffering from Juvenile onset diabetes. Most patients died soon after diagnosis and complications of the disease were hardly recorded. Onyango further stated that the complications of the disorder were virtually unknown and were brushed aside as rare amongst Africans. Today, their occurrence is common and this calls for a need to critically study the regimen for diabetics as it is mainly lack of compliance to the regimens which results in complications.

The purpose of therapy is to restore metabolic equilibrium to a state as close as possible to normal physiology. The nutritional management of Diabetes Mellitus is inseparable from the overall management of diabetes. The nutritional management involves the balancing of energy expenditure and nutrients and this involves activities and deeply ingrained habits fundamental
to life (Katzen and Mahler, 1979). The management program must be such that it can be incorporated into the patients daily routine permanently. Education of the patient then becomes an inseparable component of management as few measures are more important than proper dietary instruction at the onset of Diabetes Mellitus. Since most physicians do not have the time necessary for adequate diabetic counselling, referral to nutrition counsellors for instruction is recommended.

Counselling concerning the diabetic regimen assumes that the objective is modification of behaviour. The advice given becomes effective when the person counselled accepts and puts into practice the advice given. It is vital that the diabetics gain knowledge and skills they require to take care of themselves adequately as they are in charge of their health. When considering programs for patients with diabetes, the major question the counsellors should be confronted with is "how can such a program be implemented to maximise patient acceptance and compliance?"

A diabetic diet consists of everyday foods prepared by common cooking methods in amounts needed to attain or maintain a desirable weight. Suitor and Crawley (1984) emphasized that special foods are hardly required. Carbohydrates are an integral part of diabetic diets therefore these diets should only be viewed as regulated rather than restricted in carbohydrates. It is crucial that there be consistency of meal times, meal size
and meal composition.

As needs are always changing, the principles of a good regimen therapy should be utilized to meet those needs. Suitor and Crawley (1984) suggest that there should be variations to diabetic diets and health professionals should make sure a client's diet is tailored to his or her particular needs. Caldwell (1984) seems to argue in favour when he says that, it is not desirable to follow a set routine in diet as this can seriously interfere with other aspects of living. Rickets (1971) stresses that the diet should be specifically designed for the patients because if they comprehend it, it will increase their motivation and cooperation in adhering to the prescribed diets. The need for a somewhat relaxed approach to regimens can be summarized by the following excerpt:

'We all know such a thing as the way ward Diabetic. Exhorted not to do this or that, because of their health, they go gaily on. Defying many of the rules and getting away with it. While their more orthodox friends, who follow Instructions to the letter,Look a trifle sad' (Macleod, 1971: pg. 9).

1.2. STATEMENT OF THE PROBLEM

There was a noticeable increase of diabetic patients being admitted into the KNH wards due to complications arising from non-compliance of prescribed regimens. This called for a need
to conduct research to look at factors which could be predictive of this rampant disregard to the regimens as the disorder was not curable but could be controlled by effective regimen therapy.

1.3. PURPOSE OF THE STUDY

At Kenyatta National Hospital there was a marked increase in the incidence of complications of Diabetes Mellitus caused by poor discipline among patients in adhering to prescribed diabetic regimens. The purpose of this study was to investigate the influence of socio-economic, cultural and demographic factors on a patient's degree of compliance to prescribed diabetic regimens. Barriers which limited adoption to these regimens were identified and an attempt was made to identify characteristics of compliers as opposed to non-compliers of these regimens.

The effectiveness of the diabetic counselling which patients received from the hospital nutrition counsellors was assessed. This gave ground to suitable recommendations for continuing counselling opportunities to increase knowledge and skills for diabetic counselling so that up-to-date advice could be provided.

1.4. OBJECTIVES

1. To establish if socio-economic factors like employment,
occupation, income and formal education level influenced compliance to prescribed regimens.

2. To investigate if exposure to diabetic counselling influenced compliance to prescribed regimens.

3. To determine how the demographic characteristics, that is: age, marital status and family size of a patient influenced compliance to the diabetic regimen.

4. To find out the effect of length of illness on the control the diabetic patients chose to exert upon their care.

5. To examine the patient’s attitude towards his/her prescribed diabetic regimen and disease condition.

6. To identify barriers which limited adoption of the prescribed diabetic regimens as perceived by both patients and nutrition counsellors.

7. To examine the patient practitioner relationship as a factor which could lead to better diabetic control.

8. To find out the respondents cultural views of the disease.

9. To examine the relationship between the type of diabetes and patients’ attitudes towards disease condition.

1.5. ASSUMPTIONS

1. Patients kept their hospital appointments as they could only be interviewed during the diabetic clinic days.

2. All the patients to be interviewed would have received
prior counselling on the prescribed diabetic regimen by qualified nutrition counsellors.

1.6. LIMITATIONS
1. Only those patients attending the diabetic clinic at Kenyatta National Hospital were interviewed and this was not a representative sample of all the diabetic patients. The study results could therefore not be generalised to the overall diabetic population in Kenya.

2. It is a fact that most patients in the higher socio-economic status prefer treatment from private hospitals, so the available population of those in the high income groups was limited.

1.7. SIGNIFICANCE OF THE STUDY

Proper instruction in diet at the onset of Diabetes Mellitus is crucial otherwise the disorder could easily result into complications of the disease. This was emphasised earlier by Diehl and Dalrymple (1968) who stated that the average diabetics who took conscientious care of themselves under careful medical supervision often lived as long as their non-diabetic contemporaries.

With the increasing incidence of the complications of Diabetes Mellitus manifesting themselves at Kenyatta National Hospital it became virtually important that the diabetic patients have a fair
and unclouded picture of the effect food, insulin and insulin stimulating drugs had on their disease. If the diabetics were not clear about the current rationale behind basic principles regarding their regimen in general, they could not successfully or comfortably be in control.

Thus the study hoped to find out factors which could be reliable predictors of regimen non-compliance. These results would be invaluable to the health care professionals. With the information on attitudes and background of the patients, decisions could be made regarding the method, time and approach needed to achieve desired adoption of the regimen. This would finally lead to improved patient-practitioner relationship to serve as a basis for even better diabetic control.

1.8. DEFINITION OF TERMS

Diabetes Mellitus: Chronic metabolic condition characterized by derangements in the metabolism of glucose as well as abnormalities in metabolism of fat, protein and other substances (Anderson, 1988).

Diabetic: A person suffering from Diabetes Mellitus.

Metabolism: Sum of all chemical changes that take place within an organism by which it maintains itself and produces energy for its functioning (Williams, 1989).

Hypoglycaemia: Low blood sugar level below normal levels.

Hyperglycaemia: High level of blood sugar, above normal
levels.

Glycosuria: Abnormal elevation in the concentration of glucose in the urine.

Neuropathy: Any disorder of the peripheral (Non-central) nervous system.

Polyphagia: Excessive food ingestion due to extreme hunger.

Polydipsia: Excessive thirst with increased drinking of water.

Polyuria: A persistent increase in urinary output. It must be distinguished from micturition which is the frequent passage of urine without an increase in total volume.

Prevalence: Frequency of the disease in a population at the time a survey is taken.

Incidence: The rate at which cases arise in a certain time, usually a year.

Insulin: A hormone, a protein substance normally secreted by the beta cells of the islets of Langerhans in the pancreas. It promotes utilization of glucose.

Atherosclerosis: A condition which principally affects the aorta and large and medium sized blood vessels. Occurs in response to persistent elevation of pressure in the pulmonary arteries.

Exchange List: The most widely accepted approach to the dietary management of diabetes. It is based on some form of food groupings which were developed jointly by the American Diabetic Association, and United States Public Health Service in 1950. The groupings used most frequently are six food
exchange lists and an individual can choose a certain number of items from each of the six listed groups daily. All serving sizes or portions in one exchange provide similar amounts of energy, carbohydrates, protein and fat. The lists include many different foods and the individual's diet can thus be varied.

- **Therapeutic Diet:** A diet whose aim is to supplement medical or surgical cure or even be a treatment for a specific disease.
- **Chemotherapy:** Treatment of a disease using pharmaceutical preparations.
- **Diabetic Regimen:** A specific regimen an individual has been advised to follow and comply to. It involves instruction aimed at achieving a balance between food intake and energy expenditure under the influence of insulin.

- **Nutrition Counsellor:** The person responsible for guiding the food choices of people, either as individuals or as members of a group whenever they enter the health care system (Mitchell, et. al. 1976).

- **Diet Therapy:** That component of the treatment of an individual with an acute or chronic disease which involves the modification of food intake (Mitchell, et. al.; 1976). Follow and adhere to.

- **Diet Counselling:** Providing individualized professional guidance to assist clients in adjusting their daily food consumption to meet their health needs. It is used synonymously with nutrition counselling in this proposal. (Committee of the diet therapy section of the American Dietetic
Counselling: Listening, accepting, clarifying and helping individual client to form their own conclusions and develop their own plan for action. The counsellor translates for the patients the regimen prescribed by the physician.
CHAPTER TWO

2.0 LITERATURE REVIEW

The literature review was discussed under the following sections;

1. Compliance to diets and regimens.
2. Diabetes Mellitus.
3. Dietary management of Diabetes Mellitus.
4. Factors which could influence regimen compliance.
5. Suggested factors which could result in non-compliance of regimens.

2.1 COMPLIANCE TO DIETS AND REGIMENS

As early as 1949, a documented study had already been done to assess the development of a positive food therapy among patients. Fairfax and Robinson (1949) laid emphasis on the significance attached to food by man as an agent which could cause, cure or even prevent disease.

Kouris, Wahlquist and Worsley (1988) commented that poor compliance to dietary regimens by individuals with diabetes has generally been documented. Though there has been a great deal of speculation about reasons for poor compliance, systematic research in the area has just begun. Schatz (1988) recorded high rates of non-compliance in all age groups of diabetic patients and it was extremely interesting to note that research directed at understanding patients compliance...
behaviour resulted in findings that were not predictive of compliance or that were at best contradictory.

Kouris et al. (1988) found out that dietary compliance was independent of sex, age, occupation, marital status, ethnicity and education. Even knowledge of diabetes was not found to be a constant factor predictive of dietary compliance. Schatz (1988) studied ninety-eight patients from the Diabetes Centre at St. Vincent’s Medical Centre in Los Angeles to investigate some of the variables affecting compliance to diets in that patient population. Results indicated no significant differences between the groups (those at each extreme of compliance distribution) for sex, marital status, employment status or ethnicity. Contrary to Kouris, et al. (1988), Schatz’s (1988) findings indicated that the amount of knowledge patients acquired over their condition resulted in a positive effect in compliance. The longer the individual had been diabetic the more compliant he/she was likely to be as he/she would be more informed about his/her condition. Schatz’s findings also indicated that the patient’s level of education influences compliance in that, the more educated they were the more compliant they would be. Gicheru’s (1978) results contradict Schatz’s as he found out that a patient who had diabetes for three months appeared well controlled in blood sugar compared to the patient who had diabetes for seventeen years. Gicheru also found out that a University graduate and a fourth year University student were
not well controlled in their blood sugar compared to a first year who was well controlled. Uncontrolled blood sugar indicates poor regimen compliance.

Both Schatz (1988) and Kouris et al. (1988) drew a similar conclusion that perceived vulnerability to illness and severity of the disorder coupled with the patient's perception of the health care delivery system appeared to be important factors that have a bearing upon the control the patient chose to exert upon his/her care. Further findings by Kouris et al. (1988) indicated that diabetics who perceived dietary treatment as effective and who found few barriers to treatment adhered more readily to dietary recommendation.

Witschi, Singer, Stare and Wu lee (1978) in a similar study on dietary adherence established that family cooperation and continued education on diets have had a great impact on dietary adherence among chronically ill patients.

To understand the magnitude of the problem it is important to have a general overview about the disease and related problems arising from non compliance to prescribed diabetic regimens.

2.2 DIABETES MELLITUS

Diabetes Mellitus is a chronic disease of the endocrine system characterized by changes in carbohydrates, proteins and
fat metabolism (Weigley and Robinson, 1989). The changes result in an abnormally elevated plasma glucose which is an intermediary product in digestion of food and provision of energy from sources within the body. Carbohydrates, sugars, starches and glycogen are all broken down into glucose. The direct effect of glucose entering the blood stream from the digestive tract is restoration of blood sugar levels to the normal levels the body requires. The glucose is then transported to the muscle tissue for immediate energy needs or stored as glycogen in the liver for later use.

The conversion of glucose into glycogen can only occur through the action of insulin. The insulin, a hormone which is secreted when blood glucose and amino acid levels rise, assists their entry into the cells to be used as energy. In diabetes there could be absolute or relative deficiency of insulin and in the absence of adequate sources of insulin the glucose accumulates in the blood stream resulting in hyperglycaemia. The same condition could also arise if there is impairment of insulin synthesis. The body's ability to metabolize sugar properly is what actually leads to the serious or even fatal condition termed Diabetes Mellitus (Diehl and Dalrymple, 1968). Diabetes Mellitus is generally classified into two categories:
(a) Juvenile onset Diabetes Mellitus
(b) Maturity onset Diabetes Mellitus

Juvenile onset Diabetes Mellitus is quite commonly referred to as Insulin Dependent Diabetes Mellitus, IDDM. It occurs in both children and adults (Huskisson, 1981). It is characterized
by absolute insulinopenia, a consequence of islet B-cell destruction. The insulin deficiency leads to ineffective glucose utilization which consequently raises the blood sugar. The onset of this type of diabetes is acute, preceded by a short period of weight loss, polydipsia, polyuria and polyphagia. The patient requires insulin supplementation and a permanent dietary regimen.

Jones, Shainberg and Byer (1978) explain that insulin must be taken by injection because being a protein it would be digested if taken by mouth. Insulin supplementation is achieved by the administration of an injection once or twice daily. Insulin preparations are of two types: those that produce a quick effect like isophane and protamine zinc and those that are long acting like lente and ultra lente. Those with long acting effect call for extra careful diet planning in order to counteract the hypoglycaemic effect. Huskisson (1981) suggests that food should be taken twenty to thirty minutes after the insulin injection.

Maturity onset Diabetes Mellitus occurs later in life as the name suggests and is also referred to as Non Insulin Dependent Diabetes Mellitus, NIDDM. It is associated with the onset of obesity and is caused by sub-optimal output of insulin or by resistance to insulin utilization. It is controlled by oral hypoglycaemic agents like sulphonureas or biguanides which stimulate increased production of Insulin (Huskisson, 1981).
These drugs, explain Jones, et. al. (1978), are only effective in adult diabetics whose cells have retained the ability to produce insulin. In NIDDM control can be achieved by modification of diet, especially the intake of sugar and starches and increased exercise. Katzen and Mahler (1978) indicate that nutritional strategies for both IDDM AND NIDDM are different but in both groups the use of concentrated simple sugars needs to be restricted from regular meal planning and sweetened foods eliminated in an attempt to avoid rapid elevation of blood sugar.

There is also secondary Diabetes Mellitus a condition which occurs secondary to another disease, such as pancreatitis, cirrhosis of the liver, tumours in the pancreas or disorders of the other endocrine glands. It stops manifesting itself once the underlying problem is treated.

The onset of diabetes may be slow or dramatic but the effects can be disastrous and even tragic particularly in patients who are not careful about following their prescribed diet regimens and medications. This calls for competent control in order to control the development of the following associated complications:

(a) Atherosclerosis resulting in coronary heart disease

(b) Peripheral vascular disease causing gangrene and the damage could be so severe to warrant amputation.

(c) Retinopathy, that is, decreased vision due to Lesions in the ocular capillaries.
Kidney lesions and consequently failure (e) Neuropathies.

Huskisson (1981) reiterates further the need for meticulous control of diabetes by retaining the blood sugar level within normal limits with necessary drugs, diets and exercise as this will markedly reduce the possibility of complications.

It is significant to note that though Diabetes Mellitus can be controlled by chemotherapy, an appropriate diet is an integral part of the care plan developed for each patient. The normal diet should formulate the basis on which the modified diet is made. Such a diet is termed as a therapeutic diet and the main aim of such a diet in general would be to supplement medical or surgical care or be a specific treatment for a disease.

2.3 DIETARY MANAGEMENT OF DIABETES MELLITUS

Katzen and Mahler (1978) state that the nutritional management of Diabetes Mellitus is inseparable from the overall management of the condition.

It is normal that patients are upset and depressed when the diagnosis of diabetes is made and to be confronted with a negative attitude and a prohibitive complex diet will definitely not cheer them up. The diabetic patients should be helped to accept that their disease cannot be cured but that they can, with proper dietary care and use of insulin or oral
hypoglycaemic agents if necessary, live a comfortable productive life.

Suitor and Crawley (1984) state that a diabetic diet consists of everyday foods prepared by common cooking methods in amounts needed to attain or maintain a desirable weight. It is emphasized that special foods are not required and may not even be desirable, although a high carbohydrate - high fibre diet is being promoted on the basis that such a diet will lower blood sugar levels (Kouris et. al. 1988). The diet should be nutritionally adequate and maintain as far as possible normal blood sugar throughout the twenty four hours. However, it should not be too liberal since the patient will require more injections of insulin and this could lead to complications later in life.

Giving patients a list of foods which may be taken as desired may increase rapport between them and the counsellor and helps ensure cooperation. This then implies that the diet prescription for a patient with Diabetes Mellitus must be translated into diet patterns acceptable to them. Patients should be given diets based on the carbohydrate exchange system which can be modified to their way of life. Nutrition programs for diabetics should be implemented to maximize patients' acceptance and compliance. Caldwell (1984) argues in favour of this by claiming that the diet should be flexible to changing individual needs. Therefore crucial to the overall
management program are the patients' attitudes, motivation, knowledge and environment. The program must be such that it can be incorporated into the patients' daily routine permanently. Unlike other acute illnesses and even most chronic diseases, patients with Diabetes Mellitus assume primary responsibility for the routine daily management while the health professionals only function as advisors. This gives foundation to Skyler's (1982) suggestion that nutritional prescription of diabetic patients should be individualized and be as attractive and as realistic as possible. There should be flexibility and careful monitoring in the design of nutritional prescription.

In the pre-insulin era, extreme rigidity of diet was essential and many IDDM patients were virtually starved but at present a dietary deprivation is not regarded as a pre-requisite for optimum control. A major goal in management of IDDM is to restore efficient energy utilization as much as possible. Management of IDDM should aim at achieving a balance between food intake as a source of energy, energy expenditure and a dose of exogenous insulin. Simply put, this means, a balance between food intake, activity and insulin dosage. The fundamental nutritional strategy then is:

(a) A basic meal plan that is relatively consistent in terms of total calorie intake and is balanced in energy yielding nutrients.

(b) To provide for compensatory changes for non-basal
circumstances. There should be extra food for extra activity and extra insulin for extra food.

(c) To avoid hypoglycaemia by reasonable, consistent meal timing and provision of snacks.

(d) To avoid hyperglycaemia by omitting rapidly absorbed simple sugars from regular meal planning.

In NIDDM there should be total calorie restriction to promote weight reduction for obese patients and a low fat, low carbohydrate diet is recommended. Improved control of blood sugar levels will be achieved and long term use of oral hypoglycaemic agents will be avoided. Concentrated sugars should be completely omitted and fat intake modified.

The goals of a diabetic regimen are:

(a) To retain blood sugar concentrations within normal limits to avoid glycosuria and hypoglycaemia.

(b) To provide adequate amounts of nutrients.

(c) To maintain or restore health and keep weight at a normal level.

(d) To be adaptable to changes in the life style of the patient.

2.4 FACTORS WHICH COULD INFLUENCE REGIMEN COMPLIANCE

2.4.1 FAMILY COOPERATION

Witschi, et al. (1978) proved their hypothesis that dietary manipulation is best achieved as a family activity. The dietary
needs of one member of the family may be met by complete family participation and cooperation. It is emphasized that dietary failure may await the family member isolated by a special diet. With family cooperation long term preventive and therapeutic dietary programs can be superbly managed.

Mitchel, et. al. (1976) suggests that other members of the family should be involved in counselling sessions with the patient so that they can understand and give them support.

Present family history of diabetes might serve to supply company and consolation to a diabetic though Gicheru's (1978) findings contradict this as he concludes that positive family history or the lack of it does not seem to influence whether the diabetic is controlled or not in their blood sugar levels.

2.4.2 PATIENT PRACTITIONER RELATIONSHIP

Although it is difficult to assess the nature of such an interaction, the patient practitioner relationship is receiving a great deal of attention as a factor which could influence compliance to regimens. Smith and Hopkins (1978) indicated that close coordination and a team approach with the physician, nurse, dietician, nutrition counsellor, patient and the family was important if a diet regimen was to be adhered to. This is further stressed by Huskisson (1981) who suggests that patients with diabetes need motivation in order to be compliant to their diets. This, Huskisson explains, could be arranged by the
consultant dieticians or nutrition counsellors if they try to make the patient visit the clinic regularly. The resulting interaction will prove to the patients that there are people concerned about them and this will restimulate their interest in the diet regimen. There should also be regular re-assessment of the regimen in order to accommodate the patients' changing desires and to ensure the regimen is adequate for optimum development.

Witschi, et al. (1978) did a post study fourteen weeks after the test diet had ended and found out that the serum cholesterol levels had returned to or surpassed base line values. The results indicate the rapidity with which desired goals may be negated and the need for continued monitoring if diet adherence is to be maintained. Monitoring can only be effectively achieved through frequent patient-practitioner interaction. The increases in serum cholesterol at approximately three months after termination of the study indicate the importance of continued monitoring, encouragement and education if a long term diet is to be maintained.

Successful dietary therapy requires periodic interaction between a clever nutritional counsellor and a motivated patient (Skyler, 1982).

2.4.3 PATIENTS NEEDS

The diets in the regimens should be tailored to the patients' income (Huskisson, 1981). If this is done, it becomes
easier to comply to the regimens as they will be within the patients’ monetary reach. It is important that the individual regimen should be based on the carbohydrate exchange system modified to the patients way of life. This tends to result in less physical trauma and rebellion than a strict regimen. Prescribed regimens should also try to reflect the foods used in various cultures if the regimen is to have any effect.

Mitchell, et. al. (1976) show the importance of obtaining a complete history of the patient’s food practices and daily habits if diet compliance is to be anticipated. When, what, where and with whom the individual eats should be recorded. This information will be invaluable especially if the patient is to have a consistent meal pattern schedule for each day.

2.4.4. PATIENTS’ ATTITUDES AND KNOWLEDGE

Ginther (1971) stresses that inducing high levels of fear through persuasive messages has been shown to induce little compliance. The diabetics’ perceived vulnerability to illness and perceived severity of the disorder have been associated with regimen compliance. Kouris, et. al. (1988) suggest that persons with diabetes who perceive dietary treatment as effective and who find a few barriers to treatment comply readily to dietary recommendations.

Schatz (1988) comments that the knowledge acquired by the patients about their disease condition appears to be an
important factor that has a bearing upon the control the patients choose to exert on their care. Schatz’s findings also indicate that the number of years a patient has had diabetes, the patients education level and the amount of knowledge he/she has acquired all have a positive effect upon compliance. It is expected that the longer a patient has been diabetic the more compliant he/she is expected to be as he/she will have gained knowledge from reinforcement of the physician, other health care professionals, friends and family over time.

2.5 SUGGESTED FACTORS WHICH COULD RESULT IN NON COMPLIANCE

2.5.1 LACK OF NECESSARY EDUCATION

As previously mentioned, many diabetic patients do not know how to take care of themselves adequately. A regimen plan given to such patients is of no benefit to them if they cannot comprehend it. Moss (1971) says that the failure to educate the diabetics properly is the primary cause of poor results in diet adherence. Feldman (1971) also argues in favour of Moss by stating that patients who are given a diet and are unable to follow it lack basic knowledge of the dietary principles or lack the motivation to follow the diet. The exchange list in it’s present form can be effectively used only by patients with average or above average comprehension. It
is unfortunate that most patients with limited nutrition knowledge are unable to utilize it. These patients are the ones in most need of diabetic counselling. Mitchell, et. al. (1976) explains that given adequate instructions and time to learn, the majority of diabetic patients can manage their diets successfully. No patient can accept the diagnosis of Diabetes Mellitus and learn to manage its control during hospitalization (Mitchell, et. al. 1976). In the newly diagnosed patient there is shock, denial and depression which causes a lot of trauma, therefore effective control cannot occur at this initial stage. The patient can only learn as an outpatient being given frequent visits by the nutrition counsellors. The patient needs professional counselling by cheerful nutrition counsellors with positive attitudes instead of a restrictive approach;

2.5.2 PSYCHOLOGICAL DISTURBANCES

Since the success or failure of diabetic control rests on the patients’ ability to put into practice a multitude of management principles, patients with Diabetes Mellitus are vulnerable to psychological injury and subsequent non-compliance. Uncooperative behaviour explains Suitor and Crawley (1984), may be due to the patients’ need to assert their independence rather than misunderstanding of the treatment program. Emotional disturbances are probably the most frequent causes of over-eating. According to Sussman and
Fajan (1971) the effective management of patients who are over-eating will elude the physicians unless they are able to get to the bottom of their psychological problems.

2.5.3 ADOLESCENT REBELLION

Adolescents sometimes equate control of their diabetes with dependence to adults especially parents. In their struggle for independence and self-identity, adolescents may choose to eat whatever they please, change their prescribed insulin dosage and neglect other aspects of their care. Discipline is vital in diabetic regimen, but in this stage of rebellion the teenagers will demonstrate their independence by non-compliance to regimens. In these cases education about diet and insulin will be of little value until the underlying conflict can be ameliorated. Rickets (1971) also says that a resolution of what is causing the teenagers to rebel will almost be a pre-requisite for effective care of the young diabetics. This calls for authoritative but tactful handling of the youngsters as punitive action by those in authority will not result in adherence.

2.5.4 LACK OF PATIENT UNDERSTANDING OF IMPORTANCE OF DIET IN CONTROL OF DISORDER

Patients who have suffered from Diabetes Mellitus for several years tend to develop an over-casual approach to their diets over a period of time. The patients thus need regular
reinforcement to wipe out this attitude. Schatz (1988) argues that the over-casual approach results if the diet regimen is too complex and not easily comprehensible to the patients.

Feldman (1971) explains that the diet should be specifically designed for the patients because if they comprehend it, it will increase their motivation and cooperation in adhering to prescribed diets. In Kenya this can easily be done if the nutrition counsellors take time to discuss with their patients foods which are easily accessible to them. Out of these foods, a diet sheet can then be detailed out of the most suitable-available foods.

2.5.5 INCOME AND SOCIAL STATUS OF THE PATIENT

Financial problems prevent most patients from complying to recommended regimens. If not issued free of charge the cost of insulin or its supplements could also be a factor influencing compliance to regimens.

Most patients are also given general instructions to eat more proteins and less carbohydrates. It should be noted that carbohydrate foods are relatively cheap whereas most meats and vegetables are expensive. Patients thus believe that they cannot afford food that comprise this type of a diet. As earlier reviewed no special foods are needed for a diabetic diet, it is the proportions of the nutrients which need to be adjusted.
2.5.6 DURATION OF THE DISEASE AND PATIENTS AGE

With maturity goes responsibility, this may mean better chances of control. With the passage of time the patient is expected to be familiar with the disease, accept the situation and appreciate the role he/she has to play in his/her own management. This should lead to better control. Gicheru (1978) who studied diabetics at KNH whose age at onset of disease ranged from 6-29 years found out that the youngest patient was not well controlled compared to the oldest.
CHAPTER THREE

3.0 METHODOLOGY

3.1 RESEARCH DESIGN

The research was a case study as it was done in one institution. It was exploratory in nature as it sought to explore factors which influenced patients not to comply to their prescribed diabetic regimens.

3.2 POPULATION

Patients in and around Nairobi province suspected to be suffering from Diabetes Mellitus are referred to Kenyatta National Hospital for diagnosis. The target population thus consisted of all adult diabetic patients (over eighteen years of age) who had been diagnosed as diabetics and were attending the clinic at least once a year for check-up. These included both the juvenile and maturity onset diabetics. The accessible population consisted of those adult diabetic patients who actually came to the clinic.

3.3 SAMPLE SELECTION

To qualify for the study the patients had to have attended clinic at least three times prior to the study. A list of patients who were expected to attend clinic on the ten
consecutive fridays of the research period was drawn up each week from the hospital records. An average of one hundred and sixty patients were being seen each week. Using systematic random sampling six patients were selected for the interviews each week. They represented 5% of the patients scheduled to visit the clinic within the ten weeks of the study. This sample size was felt to be adequate given that individual interviews were to be carried out and personal hospital records studied for each patient. Being a case study of KNH a sample of sixty patients was sufficient in providing a true picture of the problem being studied.

As the number of nutrition counsellors dealing with the diabetic patients was small (10-15), all the nutrition counsellors who had ever counselled diabetic patients were given questionnaires to fill. The response rate after giving out the questionnaires three times was eight, and since this number was at least half the number of the counsellors it was felt to be satisfactory.

3.4 INSTRUMENTS USED

Two interview schedules were used. One was applied to the diabetic patients and it was pre-tested twice on twelve diabetic patients prior to the research period. The instrument filled by the nutrition counsellors was also pre-tested twice on the two chief nutrition counsellors in charge of the diabetic
patients. These two did not take part in filling the final questionnare.

(a) The instrument applied to the diabetic patients was an interview schedule, which was filled as the patients gave their responses. It was divided into four sections. Section A dealt with the general demographic data. Section B and C dealt with the patients feeding habits and attitudes towards their prescribed regimen and disease condition. Section D sought responses on the type of nutrition education received and the patient's perception of their relationship with the hospital's health professionals.

(b) The questionnaires filled by the nutrition counsellors tried to find out, if the counsellors enjoyed their work, their views about the patients and the effectiveness of their counselling services. These questionnaires were filled by the counsellors as they requested for anonymity.

3.5 DATA COLLECTION

Data were collected from personal interviews with the patients during the diabetic clinic day. Each questionnaire was numbered to represent a patient; and since it would have been difficult to trace the patients later on, all questionnaires were completed during each session. Data collection from the patients took a total of ten weeks as patients could only be interviewed
when they turned up for the clinic check-up. Data from the nutrition counsellors was derived from their self administered questionnaire which the researcher collected after they had been answered.

3.6. DATA ANALYSIS

Data analysis from patients' questionnaires was done using the computer package SPSS (Statistical package for social sciences). Percentage tables were used to summarise the demographic data. Cross tabulation frequency tables were drawn to find out the relationship between some specific variables and adherence to diets by patients. Chi-squares were then computed to determine if the relationships actually existed. Item analysis was done on all the open ended questions.

The questionnaires filled by the hospital nutrition counsellors were analyzed manually.

3.7 OPERATIONAL DEFINITIONS OF VARIABLES

Education

Referred to formal schooling. It was measured using the level of schooling attained.

Diabetic Counselling

Referred to counselling on a specific regimen received by patients from nutrition counsellors. This was measured by a patient indicating if the counselling received was adequate or
inadequate.

Marital Status

This was measured using the following categories: single, divorced, separated, widow/widower, married and living with somebody as a couple.

Family

Identified as including the patient and all those living and eating in the same household as the patient.

Family Size

Referred to the number of people living and eating in the same household as the patient, the patient inclusive.

Cultural Beliefs

Referred to the patients' cultural beliefs about the condition Diabetes Mellitus.

Attitudes

Of interest were the attitudes of the patients towards their regimens and disease condition. From a list of various opinions towards the regimens and disease condition, the patient was required to indicate those opinions which best described his/her attitude.

Economic Status

Referred to the patient's and spouse monetary income in Kenya shillings. This was later categorised into low, middle and high income.
Duration of disease

This was the length of time in months the patient had suffered from the disease since diagnosis.

Patient practitioner relationship

Was measured by how friendly and concerned the patient rated the members of the health professionals he had been in contact with. This was measured on a five point like scale ranging from unconcerned to very concerned.

Diabetes

Referred to both juvenile and maturity onset Diabetes Mellitus.

Regimen compliance

This information was sought from the patient's hospital records. The information was obtained from medical tests done on patients' blood and urine to find out the glucose level. Frequent fluctuations in glucose levels indicated poor compliance and low fluctuations were indicators of good compliance.

Diabetic Control

Diabetic control was classified as good, if there was avoidance of hyperglycaemia and hypoglycaemia and bad if there was persistent fluctuation between hyperglycaemia and hypoglycaemia.
CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.0 INTRODUCTION

The study aimed at investigating the influence of socio-economic, cultural and demographic factors on a patient's degree of compliance to prescribed diabetic regimens. Barriers limiting change to these regimens and some characteristics of compliers as opposed to non-compliers were to be identified.

Of importance also was the effectiveness of the Nutrition counselling which patients received from the hospital nutrition counsellors.

Though some of the chi-square results were not significant at the suggested confidence levels of \( p=0.05 \), the researcher found it necessary to still report them because they gave good information regarding the relationships between the studied variables.

4.1. DEMOGRAPHIC CHARACTERISTICS

4.1.1. PATIENTS AGE DISTRIBUTION

Of the patients interviewed the youngest was twenty years old and the oldest patient was eighty two years old. Table 1 gives a summary of the age distribution.
Table 1: Patients age in years

<table>
<thead>
<tr>
<th>Age in Years</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>80-and Above</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>70-79</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>60-69</td>
<td>8</td>
<td>13.3</td>
</tr>
<tr>
<td>50-59</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>40-49</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>30-39</td>
<td>11</td>
<td>18.3</td>
</tr>
<tr>
<td>20-29</td>
<td>13</td>
<td>21.7</td>
</tr>
<tr>
<td>TOTAL</td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

4.1.2. GENDER DISTRIBUTION

All the eight nutrition counsellors interviewed were females. Of the patients interviewed 43.3% were male while 56.7% were female, as shown in Table 2.

Table 2: Patients Gender Distribution

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>26</td>
<td>43.3</td>
</tr>
<tr>
<td>Female</td>
<td>34</td>
<td>56.7</td>
</tr>
<tr>
<td>TOTAL</td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

4.1.3. MARITAL STATUS

As indicated in Table 3, most of the patients (70%) were married. Twenty percent of the patients were single and they had never married, 8.3% were either widows or widowers and
one was living with a partner of the opposite sex.

Table 3: Patients marital status

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Member</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>12</td>
<td>20.0</td>
</tr>
<tr>
<td>Widow/Widower</td>
<td>5</td>
<td>8.3</td>
</tr>
<tr>
<td>Married</td>
<td>42</td>
<td>70.0</td>
</tr>
<tr>
<td>Living with a partner</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>60</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

4.1.4. FAMILY SIZE

Family size was synonymously used with the number of people living in the same household as the patient; the patient inclusive. As shown in Table 4, 3.3% of the patients lived alone while 23.3% had seven people in their households.

Table 4: Patients Family Size

<table>
<thead>
<tr>
<th>Number of people in household</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>10</td>
<td>16.6</td>
</tr>
<tr>
<td>3-4</td>
<td>16</td>
<td>26.7</td>
</tr>
<tr>
<td>5-6</td>
<td>15</td>
<td>25.0</td>
</tr>
<tr>
<td>7-8</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>More than 9</td>
<td>4</td>
<td>6.7</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>60</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
4.2. SOCIO-ECONOMIC PROFILE OF THE PATIENTS

4.2.1. EMPLOYMENT

Thirty nine of the patients were reported as employed. All those categorized as (other) were involved in subsistence farming and those categorised as (retired) had retired from gainful employment but were drawing a pension. This information is summarised in the table below.

Table 5: Patients Employment Status

<table>
<thead>
<tr>
<th>Employment Status</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployed</td>
<td>2</td>
<td>3.3</td>
</tr>
<tr>
<td>Retired</td>
<td>5</td>
<td>8.3</td>
</tr>
<tr>
<td>Housewife</td>
<td>5</td>
<td>8.3</td>
</tr>
<tr>
<td>Student</td>
<td>4</td>
<td>6.7</td>
</tr>
<tr>
<td>Employed</td>
<td>25</td>
<td>41.7</td>
</tr>
<tr>
<td>Self Employed</td>
<td>14</td>
<td>23.3</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>8.3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>60</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
4.2.2. **INCOME LEVELS**

Eighty two percent (81.7%) of the patients earned a monthly income of five thousand Kenyan shillings and less per month. Only three patients had an income of over seven thousand Kenyan shilling per month. A possible explanation for having a limited number of patients who fell in the high income category was that this group of patients sought treatment from private hospitals and therefore did not attend Kenyatta National Hospital. Table six indicates the patients' income levels.

Table 6: Income Distribution of the Patients.

<table>
<thead>
<tr>
<th>Monthly Income in Ksh</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>7001 and above</td>
<td>3</td>
<td>5.0</td>
</tr>
<tr>
<td>6001-7000</td>
<td>2</td>
<td>3.3</td>
</tr>
<tr>
<td>5001-6000</td>
<td>6</td>
<td>10.0</td>
</tr>
<tr>
<td>4001-5000</td>
<td>10</td>
<td>16.7</td>
</tr>
<tr>
<td>3001-4000</td>
<td>8</td>
<td>13.3</td>
</tr>
<tr>
<td>2001-3000</td>
<td>11</td>
<td>18.3</td>
</tr>
<tr>
<td>1001-2000</td>
<td>8</td>
<td>13.3</td>
</tr>
<tr>
<td>0-1000</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>60</td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
4.2.3. EDUCATIONAL LEVEL

Seven of the patients had not received any formal education while six had post-secondary education. Majority of them had lower secondary and primary education. This information is provided on Table seven.

Table 7: Level of schooling attained

<table>
<thead>
<tr>
<th>Schooling Level</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>College</td>
<td>6</td>
<td>10.0</td>
</tr>
<tr>
<td>Upper Secondary</td>
<td>8</td>
<td>13.3</td>
</tr>
<tr>
<td>Lower Secondary</td>
<td>12</td>
<td>20.0</td>
</tr>
<tr>
<td>Upper Primary</td>
<td>16</td>
<td>26.7</td>
</tr>
<tr>
<td>Lower Primary</td>
<td>11</td>
<td>18.3</td>
</tr>
<tr>
<td>None</td>
<td>7</td>
<td>11.7</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>60</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

4.2.4. ETHNIC DISTRIBUTION

The largest number of patients were Kikuyus (46.7%) followed by Kambas (20%). This was attributed to the fact that Kenyatta National Hospital is a referral hospital for patients in and around Nairobi province. Central and Eastern Provinces border Nairobi and that is why patients from these communities showed up in larger percentages. Table eight shows patients'
ethnicity profile.

Table 8: Patients ethnicity profile

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luhya</td>
<td>7</td>
<td>11.7</td>
</tr>
<tr>
<td>Kikuyu</td>
<td>28</td>
<td>46.7</td>
</tr>
<tr>
<td>Luo</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Kamba</td>
<td>12</td>
<td>20.0</td>
</tr>
<tr>
<td>Kisii</td>
<td>3</td>
<td>5.0</td>
</tr>
<tr>
<td>Meru</td>
<td>4</td>
<td>6.7</td>
</tr>
<tr>
<td>Embu</td>
<td>3</td>
<td>5.0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>60</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

4.3. MANAGEMENT OF THE DISEASE

Figure 1 shows that 4(6.7%) of the patients had their disease managed by diets alone. Twenty eight (46.7%) had their disease managed by diet and Insulin and 28(46.7%) had their disease managed by diet and oral hypoglycaemic drugs.
Figure 1: Management of the disease

KEY

- Diet Alone
- Diet and Oral
- Diet and Insulin
4.3.1. DISEASE CONTROL

Diabetic compliance was determined by the patients' degree of disease control. Diabetic control was classified as good if there was avoidance of hypoglycaemia and maintenance of ideal body weight and poor if there was frequent fluctuation between hypoglycaemia and hyperglycaemia and poor weight control.

**Figure 2: Disease control**

Data presented in Figure 2 revealed that 25% of the patients did not comply to their prescribed regimens while 75% complied to their regimens. The implications here are that most patients tended to comply to their diabetic regimens.
4.3.2. DURATION OF THE DISEASE

Table nine shows that the minimum duration of the disease in the patient was eleven months while the maximum duration was 480 months. The mean duration of the disease was 120.3 months.

Table 9: Duration of the disease

<table>
<thead>
<tr>
<th>Duration of disease in months</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>421-480</td>
<td>2</td>
<td>3.3</td>
</tr>
<tr>
<td>361-420</td>
<td>1</td>
<td>1.1</td>
</tr>
<tr>
<td>301-360</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>241-300</td>
<td>4</td>
<td>6.7</td>
</tr>
<tr>
<td>181-240</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>121-180</td>
<td>10</td>
<td>16.7</td>
</tr>
<tr>
<td>61-120</td>
<td>10</td>
<td>16.7</td>
</tr>
<tr>
<td>0-60</td>
<td>27</td>
<td>45</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>
4.4. ATTITUDES TOWARDS DIABETES MELLITUS BY PATIENTS

Majority of the patients (58.4%) believed that Diabetes Mellitus was a condition which could be cured, while (41.7%) believed the disease could not be cured. A cross tabulation drawn for the Variables—Control of disease and Belief of curability of disease is shown on Table 10.

Table 10: Relation between compliance to regimens and belief on curability of diabetes mellitus

<table>
<thead>
<tr>
<th>Believe disease can be cured</th>
<th>Believe disease cannot be cured</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belief</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>13.3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOTAL</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>58.3</td>
<td></td>
<td>25</td>
<td>41.7</td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

$X^2 (1, n=60) = 0.21 \quad P = 0.65$

Results indicated that there was no relation between compliance to regimens and belief on curability of disease. It was noted that 60% of the compliers believed the condition was curable while 53.3% of the non-compliers believed the condition was curable. This trend would seem to imply that an effort was
made to comply to the regimen when patients believed the condition could be cured. The results obtained showed that a significant number of patients 35(58.3%) were mis-informed about the condition as it is indicated as not curable, (Jackson and Vinnick, 1977).

The researcher was also interested in finding out how many patients had sought herbal cure for the condition. The response was very interesting as shown in Table 11 below.

Table 11: Cross tabulation for compliance to regimens by number of patients who had sought herbal cure

<table>
<thead>
<tr>
<th></th>
<th>Have sought herbalist cure</th>
<th>Have not sought herbalist cure</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>compliers</td>
<td>31</td>
<td>51.7</td>
<td>14</td>
</tr>
<tr>
<td>Non compliers</td>
<td>10</td>
<td>16.7</td>
<td>5</td>
</tr>
<tr>
<td>TOTAL</td>
<td>41</td>
<td>68.3</td>
<td>19</td>
</tr>
</tbody>
</table>

\[ X^2 (1, n = 60) = 0.03 \]

Though results indicated that there was no statistical significance between compliance to regimens and seeking of herbal cure, 75.6% of those who had sought herbal cure were documented as compliers compared to the 24.4% who were non
compliers. A total of 68.3% of the patients had sought herbal cure implying that they did not really believe the condition was incurable. Of those who had not sought herbal cure the majority tended to associate herbal practise with witchcraft. This made them sceptical about visiting herbal practitioners. These results clearly indicated that most diabetic patients were not knowledgeable about their disease condition a fact, which could inhibit regimen compliance.

Responses on the patients attitudes towards whether they found Insulin or Insulin supplements too expensive resulted in the results shown on Table 12:

\[
\text{(1, } n = 40) = 5.10 \quad P = 0.08
\]

Most of the patients 68.3% felt that the insulin insulin stimulating drugs were not expensive while 31.7% felt they were too expensive. Results obtained indicated that patients who considered insulin to be too expensive did not follow the advice as to whether insulin was expensive or not.

At Kampala National Hospital prescriptions for sweets or insulin supplements were normally available at the hospital’s pharmacy. This meant that patients had to get their prescriptions dispensed at separate pharmacies. If the patients were unable to afford the drugs they ran the risk of being poorly controlled. This could have kept the case for the
Table 12: Relationship between compliance to regimens and patients attitudes towards insulin and insulin stimulating drugs

<table>
<thead>
<tr>
<th></th>
<th>Insulin/Insulin supplements are expensive</th>
<th>Insulin/Insulin supplements are not expensive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
</tr>
<tr>
<td>Compliers</td>
<td>16 26.7</td>
<td>29 48.3</td>
<td>45 75</td>
</tr>
<tr>
<td>Non-Compliers</td>
<td>6 10</td>
<td>9 15</td>
<td>15 25</td>
</tr>
<tr>
<td>TOTAL</td>
<td>22 36.7</td>
<td>38 63.3</td>
<td>60 100</td>
</tr>
</tbody>
</table>

\[ X^2 (1, n = 60) = 0.10 \quad P = 0.76 \]

Most of the patients 63.3% felt that the insulin and insulin stimulating drugs were not expensive, while 36.7% felt they were too expensive. Results obtained indicated that compliance to regimens was not influenced by attitudes as to whether insulin was expensive or not.

At Kenyatta National Hospital prescriptions for Insulin or Insulin supplements were not always available at the hospital's pharmacy. This meant that the patients had to get their prescriptions dispensed in private pharmacies. If the patients were unable to afford the drugs they ran the risk of being poorly controlled. This could have been the case for the
15(25%) patients classified as non-compliers as the medication was an integral component in determining the level of sugar in the blood.

It was considered a negative attitude to view the disease as a life threatening disorder as the 26.7% of the patients did. Results indicated on Table 13.

Table 13: Relationship between compliance to regimens and attitude that the disease seen as a serious life threatening disorder

<table>
<thead>
<tr>
<th>Feel disease is life threatening</th>
<th>Feel disease is not life threatening</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. %</td>
<td>No. %</td>
<td>No. %</td>
</tr>
<tr>
<td>compliers</td>
<td>10 16.7</td>
<td>35 58.3</td>
</tr>
<tr>
<td>Non-compliers</td>
<td>6 10</td>
<td>9 15</td>
</tr>
<tr>
<td>TOTAL</td>
<td>16 26.7</td>
<td>44 73.3</td>
</tr>
</tbody>
</table>

X² (1, n = 60) = 1.81  P = 0.18.

Results indicated on Table 13 showed that 26.7% of the patients had a negative attitude that the disease was life threatening. Of the compliers, 16.7% felt that the condition was life threatening while 58.3% of the felt that it was not a life threatening condition. Diehl and Dalrymple (1968) stressed that the average diabetic who took conscientious care of their
disease under careful medical supervision would live as long as their non-diabetic contemporaries. For the 16.7% of the patients who felt their lives were under threat, the counsellors are faced with the task of eliminating this attitude if a higher degree of compliance is to be enforced.

Table 14: The relationship between compliance to regimens and attitude that disease is too inconveniencing a condition.

<table>
<thead>
<tr>
<th></th>
<th>Inconveniencing</th>
<th>Not Inconveniencing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Compliers</td>
<td>35</td>
<td>58.3</td>
<td>10</td>
</tr>
<tr>
<td>Non Compliers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compliers</td>
<td>9</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>TOTAL</td>
<td>44</td>
<td>73.3</td>
<td>16</td>
</tr>
</tbody>
</table>

\[ X^2 (1, n = 60) = 1.81 \quad P = 0.18 \]

Results obtained showed that 73.3% of the patients felt that the disease was inconveniencing while 26.7% felt that it wasn’t inconveniencing. Out of the compliers, 77.8% felt the condition was inconveniencing and 22.2% of the compliers felt that it was not inconveniencing. The results also showed that the attitude that the disease was viewed as inconveniencing did not influence compliance to diabetic regimens by patients.
Further probing on why they thought so resulted in answers which generally suggested that they did not find it necessary to be conscientious about their food intake. Patients did not seem to know how to balance their food intake if they were to be involved in more exerting activities and because of this most patients believed they should not be involved in activities which needed heavy manual labour.

4.4.1 ATTITUDES TOWARDS ATTENDING CLINIC

Responses as to what the patients felt about attending clinic knowing that the disease was not curable were sought. Results obtained are shown on Table 15.

Table 15: Relationship between compliance to regimens and patients attitudes towards clinic attendance

<table>
<thead>
<tr>
<th>Feel need to attend clinic</th>
<th>Feel no need to attend clinic</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Compliers</td>
<td>45</td>
<td>75</td>
</tr>
<tr>
<td>Non-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compliers</td>
<td>14</td>
<td>23.3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>59</td>
<td>98.3</td>
</tr>
</tbody>
</table>

The results showed that 98.3% of the patients felt they
needed to attend clinic. Only one patient felt that he did not need to attend clinic. This particular patient had turned up on that particular Friday simply to pick up his Insulin medication. There is need for such patients to be educated on the importance of blood and urine testing to find out the level of control they exercise. If they do not come for clinic check-ups they might never know how poor or well controlled they are and thus run the risk of suffering from complications of the disease.

4.5. ATTITUDES TOWARDS DIETS

Table 16 shows responses on what the patients felt about depriving themselves of certain foods due to their condition.

<table>
<thead>
<tr>
<th></th>
<th>Should deprive oneself</th>
<th>Should not deprive oneself</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Compliers</td>
<td>42</td>
<td>70</td>
<td>3</td>
</tr>
<tr>
<td>Non-Compliers Compliers</td>
<td>13</td>
<td>21.7</td>
<td>2</td>
</tr>
</tbody>
</table>

TOTAL 55 91.7 5 8.3 60 100
The term 'certain foods' meant foods which would rapidly raise the patients blood sugar to unacceptable levels. A small proportion of the patients (8.3%) did not really seem to be aware of the importance of diets to their disorder. These few patients did not see why they should deprive themselves of certain foods especially if the disorder was not curable. This was a negative attitude and these patients are in need of greater motivation in order to comply more to their diet.

Table 17 showed what the patients thought about limiting their starchy food intake.

### Table 17: The relationship between compliance to regimens and feelings that one should limit starchy intake

<table>
<thead>
<tr>
<th>Should Limit starchy intake</th>
<th>Should not limit starchy intake</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Compliers</td>
<td>39</td>
<td>65</td>
</tr>
<tr>
<td>Non-Compliers</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>51</strong></td>
<td><strong>85</strong></td>
</tr>
</tbody>
</table>

Out of sixty patients, 85% felt they needed to reduce their starchy intake. This indicated they were aware of the dangers of hyperglycaemia and the need to keep their blood sugar levels...
at an average.

More information on the patients’ attitudes towards their diets showed that 80% of the patients were inclined to believe that they should avoid eating anything which had a sweet taste as shown Table 18.

Table 18: The relationship between compliance to regimens and views on consumption of sweet tasting foods

<table>
<thead>
<tr>
<th></th>
<th>Should not be consumed</th>
<th>Should be consumed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Compliers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>56.7</td>
<td>11</td>
</tr>
<tr>
<td>Non-Compliers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>23.3</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>43</td>
<td>80</td>
</tr>
</tbody>
</table>

Of those not complying to regimens 93.3% felt they should not consume anything with a sweet taste as compared to the 75.6% of the compliers who felt the same. This showed that the feelings that sweet foods should be avoided did not really influence compliance to diets. Patients were inclined to believe they should avoid sweet foods as it had been stressed to them in Kiswahili 'Huu ni ugonjwa wa sukari', literally translated to mean 'This disease is caused by sugar'. Patients thus tended
to believe that the disease had been caused by sugar intake and avoiding anything sweet in taste meant probable cure or control of the disease. This attitude is wrong as diabetes is not caused by sugar intake and counsellors need to find out a better phrase to use while explaining the disease to patients.

From the data collected, it was felt that patients needed more comprehensive explanation on the effect of simple and complex carbohydrates in their diabetic regimens. Further probing on what patients thought about avoiding sugar in the diet resulted in the following.

Table 19: Relationship between compliance to regimens and attitude that if sugar is avoided the patient will be fine

<table>
<thead>
<tr>
<th>Will be fine</th>
<th>Will not be fine</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Compliers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>28.3</td>
<td>28</td>
</tr>
<tr>
<td>Non-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compliers</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>6.7</td>
<td>18.3</td>
<td>15</td>
</tr>
<tr>
<td>TOTAL</td>
<td>21</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td>35</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

Twenty one patients felt that if they avoided sugar in their diet they would be fine compared to the thirty nine patients who saw no need to avoid sugar. Eighty one (81%) of
those who felt that they should avoid sugar were compliers and 71.8% of those who felt no need to avoid sugar were also compliers. This implied that the attitude on avoiding sugar in the diet did not influence whether patients complied or did not comply to their diets.

Sugar has a hyperglycaemic action and it is advisable that it should be avoided. From results obtained, majority of the patients did not seem to be aware of this fact; indicating lack of necessary information.

Apart from these general attitudes towards diets, specific information was sought on attitudes towards the diet sheets which had been issued to patients.

From Table 20 it was observed that most of the patients (58.3%) felt that the foods listed in the diets sheets were different from the foods they used to consume before they were diagnosed as diabetics.
Table 20: The relationship between compliance to regimens and opinion that diet is different from what they had before

<table>
<thead>
<tr>
<th>Feel diet is</th>
<th>Feel diet is</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>different</td>
<td>not different</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Compliers</td>
<td>28</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>46.7</td>
<td>28.3</td>
</tr>
<tr>
<td>Non-Compliers</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>11.7</td>
<td>13.3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>35</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>58.3</td>
<td>41.7</td>
</tr>
</tbody>
</table>

$X^2 (1, n = 60) = 1.12 \quad P = 0.29$

Results indicated that there was no statistical significance between the opinion that the diet is different from what they had before and compliance to regimens. Of the compliers 62.2% felt that the diet was different while 37.8% felt that it was not different. Of the non compliers 53.3% felt that the diet was not different. This showed that the majority of the non compliers (53.3%) felt the diet was not different, while majority of the compliers 62.2% felt that it was different.

The foods listed in the diet sheets are normal day to day foods in contrast to what the diabetics felt and further research needs to be undertaken to find out why the patients held that opinion.
As shown on Table 21, a good number (73.3%) of the patients were of the opinion that they could only consume what is listed on the diet sheets.

Table 21: Relationship between compliance to regimens and the opinion that diet was too restrictive and only the listed foods were to be consumed

<table>
<thead>
<tr>
<th>Diet too restrictive</th>
<th>Diet not restrictive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Compliers</td>
<td>33</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>55</td>
<td>20</td>
</tr>
<tr>
<td>Non-compliers</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>18.3</td>
<td>6.7</td>
</tr>
<tr>
<td>TOTAL</td>
<td>44</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>73.3</td>
<td>26.7</td>
</tr>
</tbody>
</table>

Out of the 45 patients documented as compliers 73.3% felt that the diet was too restrictive and out of the 15 non compliers 73.3% felt that it was too restrictive. This consistent pattern indicated that whether the patients held the opinion that the diet was restrictive or not, it did not influence their compliance to the regimens.

It should be noted that only nine foods in the carbohydrate class were listed while there is such a wide variety of these foods from the indigenous sources. This
applied to all the food groups as only a few foods in each group were listed. This lack of effective communication needs to be addressed by the counsellors because this opinion that the diet is too restrictive could result in non-compliance if the patients become very frustrated in trying to obtain the listed foods.

Opinions on whether the patients felt that the foods listed on the diet sheets were too costly, were sought and results are indicated on Table 22.

Table 22: Relationship between compliance to regimens and opinion that listed foods are too costly

<table>
<thead>
<tr>
<th>Feel foods are costly</th>
<th>Feel foods are not costly</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Compliers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>23.3</td>
<td>31</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45</td>
</tr>
<tr>
<td>Non-compliers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>11.7</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>39</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60</td>
</tr>
</tbody>
</table>

\[ X^2 \ (1, n = 60) = 1.20 \quad P = 0.27 \]

Out of the 60 patients 65% felt that the foods were not too costly. A higher percentage of non compliers (46.7%) felt that the foods were costly compared to 31.1% of the compliers. Looking at the patients economic status (Table 6) it was noted
that majority of the patients were low income earners and this explained why some patients found the foods costly.

The foods listed were not indigenous to the patients and this meant that patients had to purchase them.

If patients found the foods costly it could have meant that the foods were not easily available to them. Response to this opinion are listed on Table 23.

Table 23: Relationship between compliance to regimens and opinion that the listed foods were not easily available to the patients

<table>
<thead>
<tr>
<th>Feel foods are not easily available</th>
<th>Feel foods are easily available</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Compliers</td>
<td>7</td>
<td>11.7</td>
</tr>
<tr>
<td>Non-Compliers</td>
<td>2</td>
<td>3.3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>9</td>
<td>15.0</td>
</tr>
</tbody>
</table>

Only 15% of the patients were of the opinion that the foods were not easily available to them. Eighty four percent (84.4%) of the compliers and 86.7% of the non compliers felt that the foods were easily available. This showed that most of the
patients felt that the foods were available.

There is need to stress that though foods could be easily available, the patients might not actually have had access to them.

Asked whether they hated the listed foods the patients gave the response indicated on Table 24.

Table 24: Relationship between compliance to regimens and feeling of dislike of the listed foods

<table>
<thead>
<tr>
<th>dislike listed foods</th>
<th>Do not dislike listed foods</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Compliers</td>
<td>8</td>
<td>13.3</td>
</tr>
<tr>
<td>Non Compliers</td>
<td>5</td>
<td>8.3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>13</td>
<td>21.7</td>
</tr>
</tbody>
</table>

\[ X^2 (1, n = 60) = 1.60 \quad P = 0.21 \]

Only 17.8% of the compliers hated the listed foods compared to the 33.3% of the non-compliers. Though results were not statistically significant, the opinion on whether patients hated listed foods seemed to influence compliance to diets. 82.2% of the compliers felt that they did not hate the listed foods compared to the 66.7% of the non adherers.

Opinions on whether the patients felt that the
amounts indicated on the diet sheets were too small resulted in
the following responses listed on Table 25.

Table 25: Relationship between compliance to regimens and
attitude towards the size and amounts indicated on
the diet sheets

<table>
<thead>
<tr>
<th></th>
<th>Amounts too small</th>
<th>Amounts not too small</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Compliers</td>
<td>36</td>
<td>60</td>
<td>9</td>
</tr>
<tr>
<td>Non-compliers</td>
<td>12</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>48</td>
<td>80</td>
<td>12</td>
</tr>
</tbody>
</table>

Eighty percent of both compliers and non-compliers felt that the amounts listed were too little which meant that they never ate to their satisfaction. Nutrition counsellors should try to include foods with bulk but low sugar level to make patients feel satisfied. This dissatisfaction with diets led some patients to consume more carbohydrate foods, that were viewed to be more satisfying, in order to get satisfied.
4.6. FACTORS THAT COULD INFLUENCE REGIMEN COMPLIANCE

4.6.1. DEMOGRAPHIC FACTORS AND REGIMEN COMPLIANCE

Cross tabulations were drawn to find out how the demographic factors influenced the degree of compliance to regimens by patients. Table 26 showed the relation between age and compliance to regimens.

Table 26: Relation between age and compliance to regimens

<table>
<thead>
<tr>
<th>Age (Years)</th>
<th>20-34</th>
<th>35-29</th>
<th>60-84</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Compliers</td>
<td>16</td>
<td>26.7</td>
<td>20</td>
<td>33.3</td>
</tr>
<tr>
<td>Non Compliers</td>
<td>2</td>
<td>3.3</td>
<td>10</td>
<td>16.7</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td>30</td>
<td>30</td>
<td>50</td>
</tr>
</tbody>
</table>

Half of the patients 50% fell in the age category of between thirty five to fifty nine years of age. Twelve patients (20%) were above sixty years while 18 (30%) were below thirty four years of age. Of those aged below 34 years 88.9% complied to their regimens, 66.7% of those aged 35-59 years were compliers and 75% of those over 60 years were compliers. The table documented high levels of compliance in all age groups.

With age goes maturity and the more mature a patient was the higher the degree of compliance expected. The results also
showed a higher rate of compliance to diets in all age groups which were contrary to Schatz (1988) findings. It was not conclusive that age influenced compliance to dibatic regimens.

Gender as a factor which could influence compliance to regimens is indicated in the following results as shown on Table 27.

Table 27: Relationship between gender and compliance to regimens

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Compliers</td>
<td>18</td>
<td>27</td>
<td>45</td>
</tr>
<tr>
<td>Non compliers</td>
<td>8</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>TOTAL</td>
<td>26</td>
<td>34</td>
<td>60</td>
</tr>
</tbody>
</table>

$X^2 \ (1, n = 60) = 0.36 \quad p = 0.53$

The male patients were represented by 43.3% while 56.7% were females. Though results indicated no statistical significance, it was noted that 40% of the compliers were male compared to the 60% who were females. Out of the 34 females 79.4% were compliers as compared to 69.2% of the male respondents. This meant that females were more inclined to comply to their regimens than males.

Relation between marital status and regimen compliance
gave the following results.

### Table 28: Relationships between marital status and compliance to regimens

<table>
<thead>
<tr>
<th></th>
<th>Single</th>
<th>Married</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>compliers</td>
<td>14</td>
<td>23.3</td>
<td>31</td>
</tr>
<tr>
<td>Non-compliers</td>
<td>3</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>TOTAL</td>
<td>17</td>
<td>28.3</td>
<td>43</td>
</tr>
</tbody>
</table>

Examination of Table 28 showed that most of the patients 71.7% were married as compared to the 28.3% who were single. 82.4% of those who were single were documented as compliers while 72.1% of those who were married were also documented as compliers. This implied that marital status did not influence compliance to regimens.

Results on the relation between family size and diabetic regimen compliances are indicated on Table 29.
Table 29: Relationship between family size and compliance to regimens

<table>
<thead>
<tr>
<th>Family Size</th>
<th>1-3</th>
<th>4-6</th>
<th>7-9</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>9</td>
<td>20</td>
<td>16</td>
<td>45</td>
</tr>
<tr>
<td>%</td>
<td>15</td>
<td>33.3</td>
<td>26.7</td>
<td>75</td>
</tr>
<tr>
<td>Compliers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non -</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Compliers</td>
<td>11.7</td>
<td>8.3</td>
<td>51</td>
<td>25</td>
</tr>
</tbody>
</table>

TOTAL: 16 26.7 25 41.6 19 31.7 60 100

The average family size was five. Out of the 60 patients 41.6% had a family size of 4-6 members. Out of those having a family size of 1-3, 56.3% were compliers. Out of those with a family size of 4-6, 80% were compliers and out of those having a family size of 7-9 84.2% were compliers. This results showed the trend that the larger the family size the higher the degree of compliance.

4.6.2. SOCIO-ECONOMIC FACTORS AND REGIMENS COMPLIANCE

Table 30 shows the relation between occupation and regimen compliance.
Table 30  Relationship between occupation and regimen compliance

<table>
<thead>
<tr>
<th></th>
<th>Self Employed</th>
<th>Employed</th>
<th>Students</th>
<th>Housewives</th>
<th>Retired</th>
<th>Unemployed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>compliers</td>
<td>16</td>
<td>26.7</td>
<td>18</td>
<td>30.0</td>
<td>4</td>
<td>6.7</td>
<td>2</td>
</tr>
<tr>
<td>Non-compliers</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>11.7</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>19</td>
<td>31.7</td>
<td>25</td>
<td>41.7</td>
<td>4</td>
<td>6.7</td>
<td>5</td>
</tr>
</tbody>
</table>
Results showed that there was no relation between occupation and compliance to regimen. All the unemployed (2) were compliers while only 2 out of the 5 housewives were compliers. It was expected that those unemployed, retired and housewives would be better compliers to their regimens as they had more time to devote to it. Of the 5 retired only 2 were compliers. Eighty six percent of those self employed and 68% of those employed complied to their regimens implying that occupation did not influence compliance to dibatic regimens by the patient. These findings were similar to Kouris et. al. (1988) results.

Table 31 summarises the findings between formal education and regimen compliance.

### Table 31: Relation between formal education level and regimen compliance

<table>
<thead>
<tr>
<th>College</th>
<th>Secondary</th>
<th>Primary</th>
<th>None</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>Compliers</td>
<td>5</td>
<td>8.3</td>
<td>16</td>
<td>26.7</td>
</tr>
<tr>
<td>Non Compliers</td>
<td>1</td>
<td>1.7</td>
<td>4</td>
<td>26.6</td>
</tr>
<tr>
<td>TOTAL</td>
<td>6</td>
<td>10.0</td>
<td>20</td>
<td>33.3</td>
</tr>
</tbody>
</table>
Out of the six who had post secondary education 91.7% were documented as compliers and out of the seven who had no formal education 85.7% were also documented as compliers. This implied that education levels did not influence compliance to regimens. It had been expected that those with a higher level of formal education would have no difficulty in following regimen instructions and would therefore comply more readily to prescribed regimens. The results showed that out of the 20 patients who had secondary education 20% were non compliers and out of the 27 patients with primary education 33.3% did not comply to their regimens also. This discredited the expectations. Patients understanding of diabetic instruction was distinctly unrelated to levels of formal education.

With higher incomes it was expected that there would be no monetary obstructions towards acquisition of foods for consumption and insulin or insulin supplements. This implied that the higher the income the higher the degree of regimen compliance expected from the patients. Table 32 summarises the results obtained.
### Table 32: Relationship between income and regimen compliance

<table>
<thead>
<tr>
<th>Income In Ksh</th>
<th>Compliers</th>
<th>Non Compliers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>6000 and above</td>
<td>11</td>
<td>18.3</td>
</tr>
<tr>
<td>3001 - 6000</td>
<td>20</td>
<td>30.3</td>
</tr>
<tr>
<td>Below 3000</td>
<td>14</td>
<td>23.3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>45</strong></td>
<td><strong>75</strong></td>
</tr>
</tbody>
</table>

Out of the 20 patients who had an income of below Kshs.3,000/-, 70% were compliers. Out of the 24 patients earning between Kshs.3000/- to Kshs.6,000, 83.3% were compliers and out of the 16 patients earning an income of above Kshs.6000/- 68.8% were compliers. These results showed that income levels did not influence compliance to diets further more it was noted that out of the 15 non compliers only 40% earned an income of less than Kshs.3,000/-.

These findings were contrary to Kouris et. al. (1988) and Schatz (1988) findings which concluded that income influenced compliance to regimens.

With maturity goes responsibility. As duration of the disease condition lengthened the patient was expected to become more knowledgeable about his/her disease condition and the
prescribed diabetic regimen as in the process he would gather more information about diabetes resulting in better compliance to regimens.

Table 33: Relationship between duration of disease and compliance to regimens

<table>
<thead>
<tr>
<th>Duration of disease in months</th>
<th>Compliers</th>
<th></th>
<th>Non-Compliers</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>451-480</td>
<td>2</td>
<td>3.3</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>3.3</td>
</tr>
<tr>
<td>421-450</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>391-420</td>
<td>1</td>
<td>1.7</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>361-390</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>331-366</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>301-330</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>271-300</td>
<td>1</td>
<td>1.7</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1.7</td>
</tr>
<tr>
<td>241-270</td>
<td>2</td>
<td>3.3</td>
<td>1</td>
<td>1.7</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>211-240</td>
<td>2</td>
<td>3.3</td>
<td>1</td>
<td>1.7</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>181-210</td>
<td>3</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>151-180</td>
<td>5</td>
<td>8.3</td>
<td>2</td>
<td>3.3</td>
<td>7</td>
<td>11.6</td>
</tr>
<tr>
<td>121-150</td>
<td>3</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>91-120</td>
<td>1</td>
<td>1.7</td>
<td>2</td>
<td>3.3</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>61-90</td>
<td>2</td>
<td>3.3</td>
<td>2</td>
<td>3.3</td>
<td>4</td>
<td>6.6</td>
</tr>
<tr>
<td>31-60</td>
<td>12</td>
<td>20</td>
<td>2</td>
<td>3.3</td>
<td>14</td>
<td>23.3</td>
</tr>
<tr>
<td>0-30</td>
<td>8</td>
<td>13.3</td>
<td>5</td>
<td>8.3</td>
<td>13</td>
<td>21.7</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>45</td>
<td>75</td>
<td>15</td>
<td>25</td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 33 shows that out of the 8 patients who had the disease for the shortest duration (0–30 months) 61.5% were compliers and 85.7% of those who had the disease between 31–60 months were compliers. Out of the 13 patients who had been diabetics for over 181 months, 73.3% were compliers.

Although there was no clear trend between duration of disease and regimen compliance, it should be noted that all the four patients who had been diabetics for over 271 months were compliers giving the probability that duration of the disease could have influenced compliance to regimen.

4.7 PATIENT PRACTITIONER RELATIONSHIP AND COMPLIANCE TO REGIMENS

Good patient practitioner relationship was seen as a prerequisite for better compliance to regimens. Results on Figure 3, 4 and 5 showed that the patients had excellent relationships with members of the medical profession they came in contact with at Kenyatta National Hospital.

Figure 3: Patient–doctor relationship

<table>
<thead>
<tr>
<th>Level of concern for patients by doctors</th>
<th>Percentage of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>very concerned</td>
<td>68.3</td>
</tr>
<tr>
<td>concerned</td>
<td>26.7</td>
</tr>
<tr>
<td>average concerned</td>
<td>3.3</td>
</tr>
<tr>
<td>slightly concerned</td>
<td>1.7</td>
</tr>
<tr>
<td>unconcerned</td>
<td>0</td>
</tr>
</tbody>
</table>
Results drawn from Figure 3 showed that 68.3% of the patients felt that the doctors were very concerned about their health, 26.7% felt they were just concerned and 3.3% felt that they had average concern for them. None felt that the doctors were unconcerned.

Figure 4: Patient-nutritionist relationship

Figure 4 showed excellent patient-nutritionist relationship as 75% of the patients felt that the nutrition counsellors were very concerned about them. This was quite commendable as with such a relationship better compliance to regimens could be expected in the long run as patients feel they can trust those entrusted with the knowledge to counsel them.
A good percentage 68.3% of patients felt that the nurses were very concerned about them while 23.3% felt they were concerned; 6.7% felt the nurses had average concern for them and 1.7% felt they were slightly concerned. No patient felt that the nurses were unconcerned about them.
4.8. RELATIONSHIPS BETWEEN TYPE OF DIABETES AND DIFFERENT ATTITUDES TOWARDS DISEASE CONDITION

4.8.1. TYPE OF DIABETES AND GENDER

Table 34: Relationship between type of diabetes and gender

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>NIDDM</td>
<td>13</td>
<td>21.7</td>
<td>19</td>
</tr>
<tr>
<td>IDDM</td>
<td>13</td>
<td>21.7</td>
<td>15</td>
</tr>
<tr>
<td>TOTAL</td>
<td>26</td>
<td>43.3</td>
<td>34</td>
</tr>
</tbody>
</table>

\[ X^2 (1, n = 60) = 0.20 \quad P = 0.65 \]

Results showed no significant relation between gender and the type of diabetes. It was noted that more females 59.4% had NIDDM compared to 40.6% males. Also a higher portion 53.6% of those with IDDM were females.

4.8.2. TYPE OF DIABETES AND OPINION THAT DIETS WERE DIFFERENT TO WHAT THEY HAD BEFORE.

Most patients 58.3% felt that their diets were different from what they used to have before they were diagnosed. Sixty nine
percent of those holding this opinion had NIDDM compared to 31.4% who had IDDM; as shown on Table 35 below.

Table 35: Relationship between type of diabetes and opinion that diet was different

<table>
<thead>
<tr>
<th></th>
<th>Diet was different</th>
<th>Diet was not different</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>NIDDM</td>
<td>24</td>
<td>40</td>
<td>8</td>
</tr>
<tr>
<td>IDDM</td>
<td>11</td>
<td>18.3</td>
<td>17</td>
</tr>
<tr>
<td>TOTAL</td>
<td>35</td>
<td>58.3</td>
<td>25</td>
</tr>
</tbody>
</table>

\[ x^2 \ (1, n = 60) = 7.83 \quad P = 0.01. \]

Results indicated statistical significance (p = 0.01) between the type of diabetes and the opinion that the diet was different. Of those who had IDDM 39.3% felt the diet was different while out of those who had NIDDM 75% felt the same. The resulting trend was that those having NIDDM had a tendency to feel that the diet was not different while those having IDDM felt it was different. A probable explanation for this result was that patients with IDDM felt their condition was more serious due to the insulin injections and strict balance of food intake. This could have influenced them into thinking
that their diet was different.

4.8.3. RELATIONSHIP BETWEEN TYPE OF DIABETES AND ATTITUDES TOWARDS DISEASE CONDITION

Table 36: Relationship between type of diabetes and attitude that disease is life threatening

<table>
<thead>
<tr>
<th>Feel disease is life</th>
<th>Feel disease is not life</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>NIDDM</td>
<td>5</td>
<td>27</td>
</tr>
<tr>
<td>IDDM</td>
<td>11</td>
<td>17</td>
</tr>
<tr>
<td>TOTAL</td>
<td>16</td>
<td>44</td>
</tr>
</tbody>
</table>

\[ X^2 \ (1, n = 60) = 4.28 \quad P = 0.04 \]

Results indicated statistical significance (P=0.04) between the type of diabetes and the attitude that the disease was life threatening. Out of the 16 patients who felt the disease was life threatening 68.8% had IDDM and out of the 44 patients who felt that it was not life threatening 61.4% had NIDDM. This meant that those with NIDDM did not find the disease life threatening compared to those having IDDM.
Forty-four (73.3%) of the patients expressed the attitude that diabetes was an inconveniencing condition while sixteen (26.7%) of the patients did not feel it was inconveniencing. Table 37 gave a summary of the results.

Table 37: Relationship between type of diabetes and attitude that diabetes is an inconveniencing condition

<table>
<thead>
<tr>
<th></th>
<th>Diabetes is inconveniencing</th>
<th>Diabetes not inconveniencing</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>NIDDM</td>
<td>24</td>
<td>40</td>
<td>8</td>
</tr>
<tr>
<td>IDDM</td>
<td>20</td>
<td>33.3</td>
<td>8</td>
</tr>
<tr>
<td>TOTAL</td>
<td>44</td>
<td>73.3</td>
<td>16</td>
</tr>
</tbody>
</table>

\[ X^2 (, n = 60) = 0.10 \quad P = 0.76 \]

Results indicated no statistical significance between the type of diabetes and the attitude that diabetes was inconveniencing. Out of the 32 patients with NIDDM 75% felt the condition was inconveniencing and out of the 28 patients with IDDM 71.4% felt the same.

Twenty five patients indicated that Diabetes Mellitus was not curable and thirty five indicated it was. This is shown on
Table 38: Relationship between type of diabetes and attitude towards curability of disease

<table>
<thead>
<tr>
<th>Type of Diabetes</th>
<th>Diabetes is curable</th>
<th>Diabetes is not curable</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>NIDDM</td>
<td>17</td>
<td>28.3</td>
<td>15</td>
</tr>
<tr>
<td>IDDM</td>
<td>8</td>
<td>13.3</td>
<td>20</td>
</tr>
<tr>
<td>TOTAL</td>
<td>25</td>
<td>41.7</td>
<td>35</td>
</tr>
</tbody>
</table>

\[ \chi^2 (1, n = 60) = 3.70 \quad P = 0.05. \]

The results indicated statistical significance (P=0.05) between the type of diabetes and the attitude that the disease was curable. Out of the 28 patients with IDDM, 28.6% believed the disease was curable and out of the 32 patients with NIDDM 46.7% felt the condition was not curable. The tendency was that those with IDDM felt the disease was not curable while those with NIDDM felt it was curable. A possible explanation for this was that those with IDDM had suffered from the condition since childhood. Most of those with NIDDM were suffering from a maturity onset condition and this made them believe that the disease would eventually get cured.
4.9. DIABETIC REGIMEN COUNSELLING FOR DIABETICS AT KENYATTA NATIONAL HOSPITAL

At Kenyatta National Hospital patients were referred to the hospital nutrition counsellors after being diagnosed as diabetics. The counsellors were entrusted with the duty of giving suitable advice to the patients to enable the patients to be able to control their disease well. From the data collected, 61.7% of the patients indicated that they had received dietary instructions as soon as they were diagnosed as diabetics. This information is shown on Table 39.

Table 39: Period when diet sheets were issued

<table>
<thead>
<tr>
<th>Period</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issued soon after Diagnosis</td>
<td>37</td>
<td>61.7</td>
</tr>
<tr>
<td>Issued on first clinic attendance</td>
<td>18</td>
<td>30.0</td>
</tr>
<tr>
<td>Issued after attending clinic twice</td>
<td>5</td>
<td>18.3</td>
</tr>
<tr>
<td>Never issued</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

It should be clarified that the counselling was given simultaneously with the diet sheets. Five (18.3%) of the patients had the sheets issued after attending clinic twice. It was commendable that diet sheets were issued to majority of the
patients soon after diagnosis because patients needed to take immediate steps in controlling their disease. For the 8.3% who had the diet sheets issued after they had attended clinic more than once, it was felt that this was an oversight which should not have occurred had both the patients and nutrition counsellors been vigilant.

When patients were asked whether any members of the medical profession had talked to them specifically about the condition Diabetes Mellitus, their responses were as following:

<table>
<thead>
<tr>
<th>Table 40: Number of patients given talks about disease condition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Those given talks</td>
</tr>
<tr>
<td>No.</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>53</td>
</tr>
<tr>
<td>Those not given talks</td>
</tr>
<tr>
<td>No.</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
<tr>
<td>No.</td>
</tr>
<tr>
<td>60</td>
</tr>
</tbody>
</table>

A lesser number, 11.7%, of the patients claimed that nobody had given them any information while 88.3% claimed they had received information. It is very important for patients to be knowledgeable about their disease condition as it is the keystone to diabetic patient management. Lack of this knowledge could easily result in regimen non-compliance, because the patients will not be conversant with the role of the
regimen in control of their disease.

From the data it was also found out that most patients received information about the disease on subsequent attendance to the clinic. This information is on Figure 6.

Figure 6: Period when information about disease was given

| 31.70% | 66.30% |

KEY

- Received information soon after diagnosis
- Received information after one clinic visits

This was not commendable as information about the disease and dietary counselling should be given concurrently as they are highly related.

Of interest also was the way the counselling was carried out. Majority of the respondents, 98.3%, as shown on Table 41(a) indicated that the amounts of food to be eaten were
explained to them by use of the counsellor's hands and fingers. To some of the patients, (11.7%), drawings were made on paper to indicate amounts of food (Table 41b) and in the one isolated case (Table 41C) where real foods were used, further probing revealed that he had received counselling in another hospital before he was referred to Kenyatta National Hospital.
Table 41: Methods of explanation of dietary intakes

(a) Explanation of amounts of food to be eaten made by use of hands and fingers.  
   Not indicated.  
   No. %
   59  98.3
   1  1.7
   TOTAL 60 100

(b) Explanation of amounts food to be eaten made by use of drawings on paper.  
   Not indicated.  
   No. %
   6  10
   54  90
   TOTAL 60 100

(c) Explanation of amounts of food to be eaten made by use of real foods in estimated amounts  
   Not indicated  
   No. %
   1  1.7
   59  98.3
   TOTAL 60 100

No explanation on amounts of food to be eaten were made using pictures or food measures. Counselling should be supplemented by relevant and up to date literature on the disease and audio-visual presentations if compliance is to be achieved. These results implied serious inadequacy in dietary
counselling of diabetic patients as they were left without having actual knowledge on the amounts of food to be eaten.

Table 42 indicates that 58.3% of the patients regarded the dietary instruction as inadequate.

Table 42: Relationship between adequacy of dietary instructions and compliance to regimens

<table>
<thead>
<tr>
<th>Dietary Instructions</th>
<th>Adequate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compliers</td>
<td>18</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>30%</td>
<td>75%</td>
</tr>
<tr>
<td>Non-Compliers</td>
<td>27</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>45%</td>
<td>75%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>45</td>
<td>100</td>
</tr>
</tbody>
</table>

\[ \chi^2 (1, n = 60) = 0.21 \quad P = 0.65 \]

Though the results were not statistically significant it was found out that 60% of the compliers felt that the instructions were inadequate and 53.3% of the non compliers expressed the same sentiments. This showed that both categories of patients felt that the instructions were inadequate. These results indicated a clear need for more explicit instructions. More
probing revealed that 63.3% of the patients expressed the need for more dietary instructions and only 36.7% of the patients felt that the instructions were adequate.

Views on spouse accompanying patients during regimen counselling

As shown on Table 43, 38.3% of the patients did not think that their spouses should be present during counselling while 36.7% felt the contrary. Twenty five percent of the patients did not have any spouses.

Table 43: Views on spouse accompanying patients

<table>
<thead>
<tr>
<th></th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spouse should not accompany</td>
<td>23</td>
<td>38.3</td>
</tr>
<tr>
<td>patients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spouse should accompany</td>
<td>22</td>
<td>36.7</td>
</tr>
<tr>
<td>patients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not applicable</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>TOTAL</td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

A follow up on these views indicated that many married female diabetics felt that since they are the ones who dealt with food matters which were being emphasised on during the counselling process, the view of being accompanied by spouses
would serve no purpose. Most of the married males felt their wives should accompany them because they dealt with the food matters. Other responses indicated that spouses should accompany them so that they would have somebody to remind them if they forgot any of the instructions given.

4.10. CLINIC ATTENDANCE BY PATIENTS AT KENYATTA

Diabetic patients at Kenyatta National Hospital are given a clinic attendance appointment, once a year. Response from what the patients felt about attending clinic once a year are shown below on Table 44.

Table 44: Satisfaction with Number of times one attends clinic in a year

<table>
<thead>
<tr>
<th>Satisfaction with attending clinic once a year</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction with attending clinic once a year</td>
<td>24</td>
<td>40</td>
</tr>
<tr>
<td>Dissatisfaction with attending clinic once a year</td>
<td>36</td>
<td>60</td>
</tr>
<tr>
<td>TOTAL</td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

A higher percentage 60% were dissatisfied with attending clinic only once a year. Further questioning revealed that most of the patients would have liked to attend the clinic more than once. Table 45 shows the response.
Table 45: Suggestion on number of times one should attend clinic

<table>
<thead>
<tr>
<th>Suggestion on number of times one should attend clinic in a year</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two times</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Three times</td>
<td>18</td>
<td>30</td>
</tr>
<tr>
<td>Four times</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>Not stated</td>
<td>24</td>
<td>40</td>
</tr>
<tr>
<td>TOTAL</td>
<td>60</td>
<td>100</td>
</tr>
</tbody>
</table>

Sixty percent of the patients expressed the desire to attend clinic more than once with 30% expressing the need to attend clinic 3 times in a year. 40% of the patients did not express any view about attending clinic more than once in a year.

The researcher had also wanted to find out if patients felt that they really benefited from clinic attendance (Table 46).
Table 46: Relationship between ability to control disease better after attending clinic and compliance to regimen

<table>
<thead>
<tr>
<th></th>
<th>Able to control</th>
<th>Unable to control</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.  %</td>
<td>No.  %</td>
<td>No.  %</td>
</tr>
<tr>
<td>Compliers</td>
<td>38  63.3</td>
<td>7  11.7</td>
<td>45  75</td>
</tr>
<tr>
<td>Non-Compliers</td>
<td>9  15</td>
<td>6  10</td>
<td>15  25</td>
</tr>
<tr>
<td>TOTAL</td>
<td>47  78.3</td>
<td>13  21.7</td>
<td>60  100</td>
</tr>
</tbody>
</table>

\[ X^2 (1,n = 60) = 3.96 \quad p = 0.05 \]

Out of the compliers 84.4% felt that they were able to control the disease better after clinic attendance while 60% of the non-compliers expressed the same sentiments. Results indicated statistical significance between ability to control the disease after clinic attendance and compliance to regimens (P=0.05). More compliers 84.4% felt able to control the disease than the 60% of the non-compliers.

During clinic attendance, patients' blood and urine were examined for sugar levels and results would give patients an indication of how well they were controlling their disease.
Negative results would shake up patients not showing good control and they would make an effort to be well controlled.

4.11 CULTURAL VIEWS ON DIABETES MELLITUS

Patients had been asked to indicate their various ethnic backgrounds as the researcher was interested in finding out the different cultural beliefs Kenyan communities had about the condition Diabetes Mellitus.

As some African communities are superstitious, the researcher had expected to come across beliefs which were not based on any reasons or facts but on old ideas. Some of the views expected were that the disease was a curse, a result of witch-craft or punishment by the Almighty for some wrong doing. This was because the disease could strike suddenly apart from being inherited.

Results indicated that most communities did not seem to have any beliefs about the disease. This could have been attributed to the fact that most of the patients were unaware of their cultural beliefs. Only one patient believed that he had acquired the disease as a result of witchcraft. Many patients gave the view that Diabetes Mellitus was just one of those inexplicable diseases which just occurred. Six respondents advanced an interesting theory that the disease was caused by ingestion of modern food stuffs. The specific foods mentioned were bread, cakes, biscuits, chocolate, artificial
views expected were that the disease was a curse, a result of witchcraft or punishment by the Almighty for some wrong doing. This was because the disease could strike suddenly apart from being inherited.

Results indicated that most communities did not have any cultural beliefs about the disease. Only one patient believed that he had acquired the disease as a result of witchcraft. Many patients gave the view that Diabetes Mellitus was just one of those inexplicable diseases which just occurred. Six respondents advanced an interesting theory that the disease was caused by ingestion of modern food stuffs. The specific foods mentioned were bread, cakes, biscuits, chocolate, artificial bottled fruit juices and bottled carbonated sodas. One patient went at length to explain that he had observed that people in his community who shunned these modern foods and strictly adhered to diets made up of indigenous foods never suffered from this condition.

4.12 PROFILE OF NUTRITION COUNSELLORS DEALING WITH DIABETICS AT KENYATTA NATIONAL HOSPITAL

All the counsellor(s) who participated in the research were females and they had worked with the patients for a period ranging from six to eleven years. Six of them indicated that prior to being employed as nutrition counsellors they had received specific training as nutritionists while two had not. Six of them expressed the view that they found their jobs
enjoyable while two felt that it was neither enjoyable nor unenjoyable.

4.13 NUTRITION COUNSELLING BY THE COUNSELLORS

Six of the counsellors indicated that they provided diabetic regimen counselling as soon as the patients had been diagnosed while two of them provided advice to patients on their first attendance to clinic. All the counsellors agreed that they gave follow up advice on patients on subsequent clinic attendance.

The researcher was interested in finding out how compliance to regimens by illiterate patients was ensured. The respondents indicated that they did not just give out the printed diet sheets, but also took pains to explain everything in the sheet in detail and in such cases the sheets were issued to serve as a reminder to the patient by his/her friends or relatives.

On their views about counselling both patients and their spouses, one of the counsellors felt it would make no difference, but seven thought it would be a good idea.

Respondents were then asked to indicate the general view they had of the diabetic patients. Although all of them felt that the patients were aware of the importance of the regimen to their disorder, four of them also indicated that they felt the patients were very cooperative. Compliance to regimens by the patients was generally indicated as good.
4.14 BARRIERS LIMITING CHANGE TO PRESCRIBED DIABETIC REGIMENS

Patients who felt that their condition merited a special diet stood a higher chance of not complying to regimens because they would need special meals which differed from the rest of the family. Table 47 shows the number of patients who ate the same meals as other family members.

Table 47: Relationship between consumption of similar foods as other family members

<table>
<thead>
<tr>
<th>Those without Similar Foods</th>
<th>Do not Consume Similar Foods</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>%</td>
<td>No %</td>
</tr>
<tr>
<td>Compliers 2</td>
<td>3.3</td>
<td>25 41.7 18 30.0 45 75</td>
</tr>
<tr>
<td>Compliers 0</td>
<td>0</td>
<td>9 15.0 6 10.0 15 25</td>
</tr>
<tr>
<td>TOTAL 2</td>
<td>3.3</td>
<td>34 56.7 24 40.0 60 100</td>
</tr>
</tbody>
</table>

Out of the total number of patients 56.7% consumed similar foods as other family members while 40% did not. Two (3.3%) of the patients lived alone. Out of those who ate similar foods as their
family members 73.5% were compliers and out of those who did not eat similar foods as other family members, 73.5% were compliers. This showed no trend between eating similar foods as other family members and compliance to regimens although those who felt a need for special diets, (40%) were quite a significant number.

When asked to explain why they felt a desire for a special diet most of the patients indicated that they simply felt the disease merited a special diet.

Table 48 shows the number of patients who ate to their satisfaction.

Table 48: Relationship between regimen compliance and eating to satisfaction

<table>
<thead>
<tr>
<th></th>
<th>Do not eat to satisfaction</th>
<th>Eat to satisfaction</th>
<th>Not Indicated</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Compliers</td>
<td>10</td>
<td>16.7</td>
<td>15</td>
<td>25.0</td>
</tr>
<tr>
<td>Non Compliers</td>
<td>1</td>
<td>1.7</td>
<td>8</td>
<td>13.3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>11</td>
<td>18.3</td>
<td>23</td>
<td>38.5</td>
</tr>
</tbody>
</table>
Many patients 43.3 did not indicate whether they ate to their satisfaction or not. Twenty three (38.3%) ate to their satisfaction while eleven (18.3%) did not.

If patients did not feel satisfied after meals due to the low carbohydrates diets they would find it hard to comply to their regimens and that is why not eating to satisfaction was seen as a probable barrier.

It should be noted that none of the counsellors found their jobs extremely enjoyable suggesting a lack of morale. With stimulated morale they might be able to carry out diabetic counselling more enthusiastically.

Disatisfaction with the members of times the patients attended clinic could constitute a barrier as patients felt the need to attend clinic more often in order to get more advice.
5.0 SUMMARY

5.1.1 PURPOSE; CONCLUSIONS AND RECOMMENDATIONS.

The purpose of this study was to investigate the influence of socio-economic, cultural and demographic factors on a patient's degree of compliance to their prescribed diabetic regimens. Barriers which limited change to this regimens were identified and the effectiveness of the counselling which patients received from the hospital nutrition counsellor was assessed.

5.1.2. RESEARCH PROCEDURE

A sample of sixty diabetic patients attending a diabetes outpatient clinic at the Kenyatta National Hospital and eight nutrition counsellors were selected for the study. Interviews using a prepared questionnaire were used to elicit responses from the patients. The nutrition counsellors' were requested to fill a self administered questionnaire which was later collected for analysis.

5.1.3. DATA ANALYSIS

Data analysis was done using the SPSS [Statistical Package For Social Sciences] computer package. Frequency tables and cross tabulations were drawn to investigate
relationship between various variables and compliance to regimens. Item analysis was done on all the open ended questions.

5.2 CONCLUSIONS

Regimen compliance by diabetic patients at the Kenyatta National Hospital could generally be documented as good. This was shown by the high number (75%) of the respondents who were regimen compliers.

Slightly more than half of the patients believed that the condition was curable—a wrong belief; in fact 68.3% were desperate enough in their search for a cure to seek herbal medication. This clearly indicated that most diabetics were not knowledgeable about their condition. It was found out that a greater effort was made to comply to the regimen if patients felt that by doing so they would eventually get cured. It was obvious that patients who did not view their disease as being life threatening stood a better chance of being regimen compliers.

Slightly more than half of the patients (51%) were low income earners. Therefore unavailability of insulin and its supplements in the hospital pharmacy sometimes could have resulted in poor disease control in some patients.

It was evident that the patients recognised the value of attending clinic to be able to monitor their disease condition. They even expressed the need to attend clinic more than once
a year for the medical checkup.

There was a general view that the prescribed diet regimen differed from patient's former diets. This resulted in patients feeling that the condition was very inconveniencing as it was affecting their diets and lifestyles.

This finding indicated a lack of understanding of how carbohydrates function in the body. There was a need to explain that simple carbohydrate foods like sugar and sugar sweetened foods rapidly elevate blood glucose and should be avoided. Instead consumption of complex carbohydrates should be encouraged as this would ensure slow release of glucose in the blood.

Apart from the attitude that they could only consume what was listed on the diet sheets, most of the patients expressed the view that the foods listed on the diet sheets were different from the kind of foods they had been used to. Foods listed were considered to be common day to day foods by the nutrition counsellors and further research into this specific attitudes is suggested. Patients also felt that the diet regimen was restrictive because they could only consume what was listed. Moreover a significant number of patients indicated that the foods were costly and the amounts indicated were not sufficient to satiate hunger.

Education, occupation and income did not seem to play a major part in compliance to regimens. The same applied to age and marital status.
There was a definite pattern suggesting that females were more inclined to comply to their regimens than their male counterparts. Family size seemed to influence compliance in that the bigger it was the greater the degree of compliance. Duration of the disease seemed to influence compliance to regimens and this could be attributed to the fact that patients gained more knowledge with the passage of time as they were exposed to more information resulting in better compliance.

It was encouraging to find out that the patient-practioner relationships were regarded as excellent as a high percentage of the patients felt that the doctors, nurses and the nutrition counsellors were very concerned about their health. This was seen as a prerequisite for even better control.

Patients having NIDDM had a tendency to feel that their condition would be cured. This could have been due to the fact that it was a maturity onset disorder and they felt that it was a temporary disease which could be cured like any other. Furthermore those with NIDDM had a tendency to feel that their diets were not really different from what they had before, compared to those with IDDM. Those patients having IDDM found their condition life threatening. These patients suffered from complete insulinopenia and therefore had to be very careful about balancing their dietary intake and insulin injections and because of this they felt that the condition was extremely serious.

Though nutrition counseling for diabetic patients was
issued soon after diagnosis there was a serious inadequacy in the way it was carried out. There was lack of adequate material to carry out dietary counselling and the nutrition counsellors used only their fingers and hands to demonstrate to the patients the amounts of food they could consume. More than half of the patients indicated that dietary instructions was inadequate. Patients were also dissatisfied with attending clinic once a year for their medical check up.

It is recomended that diabetic regimen counselling should be decentralised from KNH which is a referral hospital to more easily accesible areas like Health Centres and District Hospitals. The counselling should be conducted by nutrition field workers attached to the rural areas.

None of the nutrition counsellors felt that their jobs were satisfying. This suggests that lack of adequate materials to be used in dietary guidance made their jobs frustrating resulting in a frustrated worker with a low self esteem.

Though Kenya is made up of a multi-cultural society as reflected by the various people from different ethnic groups who turned up for their clinic appointments, it was incredible that the diet sheets issued at Kenyatta National Hospital did not reflect the wide variety of staple foods most communities use in their day to day diets in other parts of Kenya especially in the rural areas. It is recommended that more of the indegenous foods like pumpkin, arrow-roots, cassava, yams, sorghum and cracked wheat be added on the diet sheets.
5.3 CONTRIBUTIONS OF THE STUDY

Previous research on Diabetes Mellitus has focused on the medical aspects. It is crucial that the dietary aspects of the disease be addressed. This research therefore serves as an opening into more diet oriented research.

The result of this study will be of significant value to members of the health care profession dealing with diabetic patients. It is hoped that these results will pay a great role in formulating decisions regarding the method and approach needed to achieve desired dietary change.

5.4 SUGGESTIONS FOR FURTHER RESEARCH

From the findings of this study it is recommended that further research should be carried out as follows:

1. A similar research be carried out using large samples in all provincial hospitals and larger private hospitals in Kenya.

2. Studies on the possibility of introducing more indigenous foods on the diabetic diet sheet be carried out.

3. A survey should be done to find out if there actually exists a relationship between modern life styles and diabetes especially in relation to modern food habits.

4. An analysis should be done on nutrition counselling given by private practitioners in their clinics to assess if it is more effective than the counselling in
the government hospitals.

3. A study be carried out to find out if counselling services can become more effective if counsellors are provided with materials like food models, pictures, slides, video clips and more supportive literature on the disease.
BIBLIOGRAPHY


APPENDICES
NUTRITION STAFF QUESTIONNAIRE

Effectiveness of nutritional counselling given to diabetic patients at Kenyatta National Hospital.

Dear Nutrition Counsellor,

I am a postgraduate student at Kenyatta University. I am carrying out research to find out factors that could influence diet non-adherence amongst diabetic patients at Kenyatta National Hospital. Assistance from you by filling the following questionnaire fully will be appreciated. Information received will be treated in strict confidence. Results of the study will be shared on request.

Yours sincerely,

EMILY SAKWA
Complete the following questionnaire

1. Gender
   1. Male
   2. Female

2. Please indicate the year you were employed as a nutrition counsellor in this hospital.
   19

3. Prior to your employment, were you specifically trained as a nutritionist?
   1. No
   2. Yes

4. Please indicate how well you enjoy your job

   Extremely unenjoyable
   Unenjoyable
   Neither enjoyable nor unenjoyable
   Enjoyable
   Extremely enjoyable

5. When do you give your patients initial nutrition counselling on the care of their condition?
   1. Any time I feel it is convenient
   2. Patients second attendance to diabetic clinic
   3. Patients first attendance to diabetic clinic
   4. Soon after diagnosis
6. Is there successive follow up of the counselling?

1  [ ] No
2  [ ] Yes

7. When you give out the printed diet sheets, how do you ensure that the illiterate patients adhere to the diets?


8. What are your views about counselling both the patient and the spouse?

1  [ ] Not necessary
2  [ ] A bit tiring
3  [ ] Does not really make a difference
4  [ ] A good idea

9. Please indicate which of the following views you agree with about your diabetic patients.

1  [ ] Uncooperative about their diets
2  [ ] Do not really care about their disease
3  [ ] Do not appreciate the seriousness of their disorder
4  [ ] Very cooperative
5  [ ] Are aware of the importance of diet to their disorder
10. Generally how would you document adherence to prescribed diet regimens by your adult patients?

1. Poor
2. Fair
3. Average
4. Good
5. Excellent

11. Please list down the materials you need for more effective counselling e.g. - Video tapes
    - Illustrated booklets
    - Slides etc.

    a) ___________________________________________________________________
    b) ___________________________________________________________________
    c) ___________________________________________________________________
    d) ___________________________________________________________________
    e) ___________________________________________________________________
    f) ___________________________________________________________________
    g) ___________________________________________________________________
    h) ___________________________________________________________________
    i) ___________________________________________________________________
    j) ___________________________________________________________________

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APPENDIX II

PATIENTS QUESTIONNAIRE

DIABETES QUESTIONNAIRE

Factors which could influence diet non-adherence amongst patients attending clinic at Kenyatta National Hospital

SECTION A (Part 1)

To be filled from hospital records.

1. Age __________ (Years)

2. Gender
   1 Female
   2 Male

3. Weight
   1 Overweight
   2 Normal
   3 Underweight

4. Duration of disease __________ (Months)

5. Control of disease
   1 Very poor control
   2 Poor control
   3 Average control
   4 Good control
   5 Excellent control
6. Management of disease

1. Diet alone
2. Diet and oral hypoglycemic drugs
3. Diet and insulin

SECTION A (Part II)

Answers from patient interview

Tick where appropriate

7. What is your marital status at present?

1. Single
2. Divorced
3. Widow/Widower
4. Married
5. Living together with somebody as man/wife

8. How many people live in your household, you included?

1. None, only myself
2. Two
3. Three
4. Four
5. Five
6. Six
7. Seven
8. Eight
9. Nine
10. More, indicate Number
9. Indicate your level of schooling

1. None
2. Lower Primary (up to class 5)
3. Higher Primary (up to class 8)
4. Lower Secondary (O-Level)
5. Upper Secondary (A-Level)
6. College
7. University
8. Others, Indicate __________________________

10. At present, are you

1. Unemployed
2. Retired
3. Housewife
4. Student
5. Employed
6. Self Employed
7. Other, state which __________________________

11. In which category does your income per month fall?

1. < -1000
2. 1001-2000
3. 2001-3000
4. 3001-4000
5. 4001-5000
6. 5001-6000
7. 6001-7000
8. More than 7001 (Amounts are in Kenya Shillings)
SECTION B

To be filled by interviewing patients

12. What ethnic group do you belong to?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Luhya</td>
<td>06</td>
</tr>
<tr>
<td>02</td>
<td>Kikuyu</td>
<td>07</td>
</tr>
<tr>
<td>03</td>
<td>Luo</td>
<td>08</td>
</tr>
<tr>
<td>04</td>
<td>Kamba</td>
<td>09</td>
</tr>
<tr>
<td>05</td>
<td>Maasai</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Kalenjin</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Giriama</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Embu</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Taita</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pokomo</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kisii</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Meru</td>
<td></td>
</tr>
</tbody>
</table>

13. (a) At meal times do you eat food similar to that served to other family members?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>N/A</td>
<td>no family</td>
</tr>
</tbody>
</table>

(b) If your answer to 13 (a) is YES, do you eat enough to make you very satisfied?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

(c) If your answer to 13(a) is NO, please give the reason(s) which make you feel that you need a special diet.

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________
14. When you go visiting, do you tell your host about your condition, so that special food is prepared for you?

1. [ ] No
2. [ ] Yes

15. Give reasons for your answer.

________________________________________________________________________

________________________________________________________________________

16. You have been given diet sheets (show patient an example), showing you the foods you can eat. Which of the following opinions can best describe your feelings about the listed foods.

1. [ ] Diet is different from what I was used to
2. [ ] Diet is too restrictive, I feel I can't eat anything else, apart from what is stated
3. [ ] The foods mentioned are costly
4. [ ] The foods are not easily available to me
5. [ ] It is okay, the foods are easily available
6. [ ] I hate the foods listed
7. [ ] Amounts given are too small, I get very hungry
17. What do people in your community believe about the disease diabetes mellitus?

1. Punishment for wrong doing
2. Curse
3. Result of witch-craft
4. Other, explain ________________

18. Do you agree with your community's belief?

1. Strongly disagree
2. No opinion
3. Strongly agree

19. According to community's belief, what should one do if they are suffering from the disease?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
SECTION C

20. What do you really feel about this condition diabetes mellitus? (Tick any view that you agree with)

1. If I avoid sugar in my diet I will be okay
2. I should avoid eating anything which has a sweet taste
3. I should limit my intake of starchy foods
4. Since it is not curable there is no need to deprive myself of certain foods.
5. I do not really see why I should come to clinic knowing I will not be cured.
6. The insulin and insulin supplements are too expensive
7. It is a serious, life threatening disorder
8. Too inconveniencing a condition

21. (a) Are you aware you can suffer from the following complications of the disease?

<table>
<thead>
<tr>
<th>Complication</th>
<th>Not Aware</th>
<th>Aware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leg wounds which could warrant amputation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blindness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kidney failure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nerve paralysis</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

21. (b) If aware, are you worried about these complications?

1. No
2. Yes
22. Do you really believe the disease cannot be cured?

1  No
2  Yes

23. (a) Have you ever sought a herbalist's cure for the disease?

1  No
2  Yes

(b) If No, please indicate why?

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

SECTION D

24. Can you recall when you were given these diet sheets?

(Show patient one)

1  Soon after diagnosis
2  As soon as I began attending clinic
3  After I had attended clinic approximately three or more times
4  I was never given one
25. Can you remember if anybody (any of the medical professionals) talked to you about your disorder e.g. tell you the causes and what you could do to control it?

1 [ ] No
2 [ ] Yes

26. If your answer to question 25 is YES,
When were you told this?

1 [ ] Soon after diagnosis
2 [ ] During one of the clinic visits
3 [ ] Never told

27. (a) When you were receiving instructions regarding what kind of diet you should follow did you feel that your spouse should have accompanied you?

1 [ ] No
2 [ ] Yes
3 [ ] Not applicable

(b) Give reason(s) for your answer

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
28. How did the nutritionists explain to you the amounts of food that you can eat?

1  By using hands and fingers to show amounts
2   using pictures
3  By drawing on a piece of paper
4  Using food measures i.e. scale or household container
5  By using real foods in the estimated amounts

29. Can you say that the instructions were adequate?

1  Instructions inadequate
2  Instructions adequate

30. Do you feel that you still need more instructions?

1  Yes
2  No

31. After attending clinic severally, do you feel you are able to control your disease better?

1  Yes
2  No

32. Give reasons for your answer.

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
33. Are you satisfied with the number of times you attend clinic?

1  No
2  Yes

34. If No suggest how many times you feel you should attend clinic in a year.

1  Two times
2  Three times
3  Four times

35. Please give a rating of the health professionals you have come into contact with at the Kenyatta National Hospital?

<table>
<thead>
<tr>
<th></th>
<th>Unconcerned</th>
<th>Slightly concerned</th>
<th>Average</th>
<th>Concerned</th>
<th>Very concerned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctors</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Nutritionists</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Nurses</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

36. Apart from the diet sheets and accompanying instructions you receive from the nutritionist, what other method/assistance do you need for effective learning of your diet? e.g. - book lets - visit by nutrition - video tapes educators at home
APPENDIX III A
DIABETIC DIET SHEET ISSUED AT KENYATTA NATIONAL HOSPITAL

VYAKULA VYA KUDULISHA UZANI

A USITUMIE VYAKULA VIFUATAVYO

Sukari
Miwa
Matunda iliyo wekwa kwa mkebe
Maji ya chupa au ya mkebe iliyo ungezwa sukari
Mraba wa matunda (jamu au marmalade)
Asali
Peremende
Chocolati
Mkate
Biskuti
Soda za kila aina
Pombe
Pombe kali
Vinywaji vilivyotungwa ongezwa sukari
Vyangaleke vilivyona kwa mafuta nyingi.

B TUMIA VYAKULA VIFUATAVYO KAMA ULIVYOEOLEZWA

(I) VYAKULA VYA KUKUPA NGUVU

Tumia na mboga nyingi kila wakati
Ugali
Chapati
Mohele
Viazi
Ndizi
Mkate
Uji wa wimbi
Mahindi na maharagwe
Viazi vikuu – Tumia kidogo

(II) MAFUTA

(Mgonjwa ambaye anata kikana kupunguza uzani anafaa
kupunguza kula vyakula vya mafuta)

Tumia kiasi kidogo cha mafuta yoyote ya kupika, iwe
mafuta ya mboga au mahindi.
Usitumie mafuta kutoka kwa mnyama.

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(III) JAMII YA MAHARAGWE NA KADHALIKA

Ndengu
Maharagwe iliyokauka
Mbinzi iliyokauka
Nbaazi
Njugu karanga

Tumia vyakula hivi unavyotaka.

(IV) VYAKULA VYA KUJENGA MWILI

Nyama ya ngombe
Nyama ya mbuzi
Kondoo
Kuku
Samaki
Mayai matatu kwa wiki
Bilauri mbili ya maziwa
Jibini

(V) MBOGA

KUNDI HII TUMIA UPENDAYO (Tumia kwa wingi)

Sukuma wiki
Kabichi
Kunde
Spinachi
Nyanya Saladi
Mboga yoyote ya majani ya kienyeji

KUNDI LA PILI: TUMIA ILIVYOZELEZWA.

Karoti
Mbinzi mbichi
Maharagwe mbichi
Mahindi mbichi
Malenge
Tumia na maboga mengine ya majani.

(VI) MATUNDA

Tumia moja au mbili kila siku;
Machungwa
Ndizi iliyoiva
(VI) Paipai  
Nanasi  
Mapera  
Zambarau  
Tafaa  
Maembe  
Limau  
Ndimu

(VII) VIINYWAJI  
Chai  
Kahawa  
Cocoa  
Mchuzi na supu ya mifupa

(VIII) VIUNGO VYA KUTIA UTAMU KWA CHAKULA  
Chumvi  
Pilipili  
Bizari  
Tanga wizi  
Viungo ladha.
APPENDIX III B

DIABETIC DIET SHEET ISSUED AT KENYATTA NATIONAL HOSPITAL

(This diet sheet has been retyped without any alteration other than translating it into English from the Kiswahili diet sheet)

WEIGHT MAINTAINING DIET

A DO NOT USE THE FOLLOWING FOODS

- Sugar
- Sugar-cane
- Tinned fruits
- Sweetened bottled or tinned fruit juice
- Jam or Marmalade
- Honey
- Candy
- Chocolate
- Bread
- Biscuits
- All types of Soda
- Alcohol
- Spirits
- Any sweetened drinks
- Food fried in a lot of fat.

B USE THE FOLLOWING ACCORDING TO GIVEN INSTRUCTIONS

(I) ENERGY GIVING FOODS

- Stiff porridge (ugali)
- Unleavened bread (chapati)
- Rice
- Potatoes
- Bananas
  (Use the above with plenty of vegetables always)
- Brown bread
- Millet porridge.
- Maize and beans.
- Sweet potatoes (use sparingly)

(II) FATS

Patients on weight reduction diet need to reduce their fat intake.

Use limited amounts of any cooking fat whether it is vegetable fat or Corn oil.

Avoid animal fats.
(III) PULSES AND OTHERS

These foods can be used as desired.
Green grams
Dry beans
Dry peas
Pigeon peas
Ground nuts

(IV) BODY BUILDING FOODS

Beef
Goat meat
Mutton
Chicken
Fish
Eggs (maximum of three per week)
Milk – 2 glasses
Cheese.

(V) VEGETABLES

Use as desired
Kale
Cabbages
Cowpea-leaves
Spinach
Tomatoes
Any traditional leafy vegetables.

USE THE FOODS LISTED BELOW AS PER INSTRUCTIONS

Carrots
Peas
Green beans
Green maize
Pumpkin
Mix with other green vegetables before use.

(VI) FRUITS

Use one to two fruits per day
Orange
Ripe banana
Pawpaw
Pineapple
Guavas
Grapes
Apples
Mango
Lime
Lemon
(VII) BEVERAGES

Tea
Coffee
Cocoa
Soup
These can be used as desired.

(VIII) SEASONINGS

Salt
Pepper
Curry
Ginger
Any other spices and flavourings.
The Secretary,
National council for Science and Technology
P. O. Box 30623
NAIROBI

RESEARCH AUTHORISATION

APPLICANT(S) ................................................................. EMILY SAKWA

The above named has been authorised to conduct research on
"FACTORS THAT INFLUENCE DIET NON-ADHERANCE AMONGST DIABETIC PATIENTS: A CASE
STUDY KENYATTA HOSPITAL"

As indicated on the application form, this research will be conducted in
NAIROBI

For a period ending ....................................... NOVEMBER 1992

Under the Standing Research Clearance awarded to Kenyan Universities/Public
Institutions.

I herewith enclose copies of her application for record purpose. He/She has also
been notified that we will need a minimum of two copies of her research findings
at the expiry of the project.

J. A. MACOLOO(MRS)

FOR: PERMANENT SECRETARY/ADMINISTRATION

cc.
CHAIRMAN
DEPT. OF HOME ECONOMICS
KENYATTA UNIVERSITY
P. C. NAIROBI AREA

EMILY SAKWA
DEPT. OF HOME ECONOMICS
KENYATTA UNIVERSITY
The Director of Medical Services
Afya House
NAIROBI.

Dear Sir,

RE: LETTER OF CLEARANCE

E55/7606/90 EMILY SAKWA

This is to confirm that the above named is a Master of Education student at this University. She would like to be given clearance to enable her conduct research at Kenyatta National Hospital which will help her write her thesis.

Any assistance given to her will be highly appreciated.

WATIBINI

for DEAN, FACULTY OF EDUCATION
The Dean,
Faculty of Education,
Kenyatta University,
P.O. Box 43844,
NAIROBI

Attention: Mr. J. Watibini

RE: LETTER OF CLEARANCE - E55/7606/90 EMILY SAKWA

I wish to acknowledge receipt of your letter of 13th July, 1992.

In this connection, clearance is hereby granted for the above named to enable her conduct research at Kenyatta National Hospital which will help her write her thesis.

PROF. G.B.A. OKELO
DIRECTOR OF MEDICAL SERVICES
18th September 1992

Ms. Emily Sakwa
Kenyatta University College
P.O. Box 43844
NAIROBI

Re: Research Proposal entitled "Factors that influence diet non-adherence amongst diabetic patients. A case study at Kenyatta National Hospital" P28418192

I am pleased to inform you that the Kenyatta National Hospital Ethical and Research Committee (KNH-ERC) has reviewed and approved the revised format of your above cited research proposal.

On behalf of the Committee I wish you fruitful research and look forward to receiving a summary of your research findings upon completion of the study. This information will guide the committee when approving future related studies so as to minimise study and avoid duplications.

Thank you.

Dr. Anastasia N. Guantai
SECRETARY KNH-ERC

cc. Prof. F.E. Onyango - Chairman KNH-ERC
Deputy Director - Clinical Services - KNH
Supervisor - Dr. Kiamba - Dept. of Community Health, U.o.N.