

ASSESSMENT OF NUTRITION CARE, FOOD SERVICE QUALITY,  
AND NUTRITION STATUS OF HOSPITALIZED PATIENTS AT  
NAKURU LEVEL FIVE HOSPITAL, KENYA

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DEPARTMENT OF FOOD SCIENCE NUTRITION AND TECHNOLOGY  
FACULTY OF AGRICULTURE  
UNIVERSITY OF NAIROBI

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## Declaration

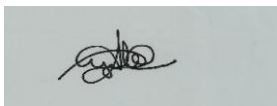
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## **Dedication**

This work is dedicated to my dear parents, David Kiprono and Christine Kiprono, my husband, Dominic Kiprotich and all my siblings who were a constant pillar of support throughout my studies.

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I give glory and honor to God, the Almighty Father whose grace and love have sustained me from the beginning of my dissertation work to the end.

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### **List of abbreviations and acronyms**

<b>BMI</b>	Body Mass Index
<b>CI</b>	Confidence Interval
<b>ENT</b>	Ear, Nose and Throat
<b>ICU</b>	Intensive Care Unit
<b>LOS</b>	Length of Stay in Hospital
<b>MCH</b>	Maternal and Child Health Clinic
<b>FP</b>	Family planning
<b>MoH</b>	Ministry of Health
<b>MUAC</b>	Mid- Upper Arm Circumference
<b>NPO</b>	Nil Per Oral (Nil by mouth)
<b>PI</b>	Principal Investigator
<b>SPSS</b>	Statistical Package for Social Scientists
<b>OR</b>	Odds Ratio
<b>US</b>	United States

## Operational definitions

**Body Mass Index:** an index for determining the nutritional status of an individual by taking the weight in kilogram and dividing with the square of the height in meters and comparing on scale to provide a classification.

**Diet satisfaction:** This refers to a patient's perception and acceptability of hospital food based on selected aspects like variety, type, portion size, temperature, taste, and appearance, time of distribution, overall quality, and attitude of hospital staff serving food.

**External food:** Food and beverages that were not part of the Nakuru Level Five Hospital menu, sourced from outside.

**'Ex novo' malnutrition:** Malnutrition during hospital stay caused by deficiencies in hospital diets, fasting periods because of diagnostic or therapeutic procedures, and metabolic stress associated with illness.

**Food service:** Provision for the nutritional needs of inpatients through food production (preparation of meals), diet modification (those needing special diets), transportation, and distribution of food to all patients

**Food service quality:** Refers to the overall impression of the patients and staff about hospital food service

**Iatrogenic malnutrition:** Type of hospital malnutrition induced by hospital internal and external environment; medical treatment, diagnostic procedures, poor quality of nutrition care, poor quality of food services, lack of resources and equipment for proper nutrition diagnosis and intervention, and poor hospital environmental conditions

**Level Five Hospital:** Kenyan referral hospital with a high volume of patients with specialized medical care.

**Malnutrition:** A condition that arises due to insufficient intake of nutrients or excess intake and thus can either be undernutrition or overnutrition.

**Nutritional assessment:** The process of determining the nutritional status of a hospitalized patient; usually involves taking the diet history, and intake data, biochemical measurements, clinical data, and medical history; anthropometric measurements, and psychosocial information.

**Nutrition Care:** All activities involved in ensuring that the Nutrition Care Process (NCP) is achieved. It involves a systematic approach to providing high quality nutrition care. The NCP consists of four distinct, interrelated steps:

**Nutrition Assessment:** The RDN collects and documents information such as food or nutrition-related history; biochemical data, medical tests and procedures; anthropometric measurements, nutrition-focused physical findings, and client history.

**Nutrition Care Quality:** Refers to the overall impression of the patients and staff about activities that promote optimum nutrition support for patients

**Nutrition Status:** Determination of the extent to which the individual's physiological need for nutrients has been met.

**Nutritional screening:** A standard, easy, efficient procedure to identify patients at nutritional risk who require nutritional assessment.

**The overall quality of hospital food:** Refers to the overall impression of the patient about hospital food.

**Patient satisfaction:** This refers to a patient's perceptions and acceptability of hospital food based on selected aspects like variety, type, portion size, temperature, taste, and appearance, time of distribution, overall quality, and attitude of hospital staff serving food.

**Undernutrition:** A form of malnutrition that arises due to deficiency of one or more nutrients in the body and the most common being protein energy malnutrition

## **Abstract**

Hospital malnutrition is a significant problem in both developed and developing countries. Globally, 462 million adults are undernourished (World Health Organization, 2014) whereas, malnutrition among adult patients within the hospital setting has been vastly reported to range between 30% and 50%. Hospital malnutrition is associated with many adverse outcomes including higher rates of infection, increased severity of illnesses, longer length of stays, increased health care costs, and higher mortality rates. Malnutrition is reported to be common amongst inpatients due to the poor quality of nutrition care and food service. Intensification of both nutritional care and food service quality is therefore required to reduce the prevalence of hospital-acquired malnutrition. The main objective of this study was to assess nutrition care, food service quality, and nutrition status of hospitalized patients in medical and surgical wards at the Nakuru Level Five Hospital, Kenya.

A descriptive cross-sectional study design was used. Data was collected from Nakuru Level Five Hospital which was purposively selected. A total of 188 adult patients and 15 key informants were interviewed. The key informants included the chief nutritionist; nutritionists, nurses, and doctors from both surgical and medical wards; kitchen nutritionist, and chief cateress. Both the adult patients and the health care staff were consecutively and purposively sampled respectively. A consecutive sampling of the patients entailed every patient meeting the inclusion criteria being selected until the required sample size was achieved while the key informants were purposively sampled since they met the requirements of being health care staff and their roles were directly or indirectly related to the medical and surgical wards. Semi-structured questionnaires were used to collect data on demographic, socio-economic, education and household characteristics, and nutrition assessment, patient's satisfaction with hospital food and food service and nutrition care services, patients experience and challenges, patient's expectation of nutritionists, supplementation of hospital food and food frequency intake was collected. Key informant interviews were used to collect information from 15 health care staff on their perception and satisfaction levels on nutrition care and food service quality and basic factors that potentially affect nutrition status.

The study participants were 188 patients; male patients were 103 (54.79%); with 49 (49.49%) and 54(60.67%) from the medical and surgical ward respectively. Females patients were 85(45.21%); with 50 (50.51%) and 35(39.33%) from the medical and surgical ward respectively. The results showed the majority of the patients had normal Body Mass Index (BMI)



105(55.85%) and Mid Upper Arm Circumference (MUAC) 129(68.62%). However, nutrition assessment within the hospital setting was lacking and not prioritized as a fundamental routine exercise with only 24 participants (12.77%) having their weight taken at admission, this directly affected nutrition care quality. The mean length of stay for male respondents was significantly higher than female participants (p-value = 0.0027). The mean length of stay for patients at the surgical ward was longer compared to those in the medical ward, however, this difference was not significant (p-value = 0.0817). In addition, undernourished patients stayed longer in the hospital (mean length of stay of 4 weeks). The patients were satisfied with different aspects of food and food service. However, both patients 108(57.44%) and health care staff, 8(53%) of the health workers were dissatisfied with food variety and one major reason for supplementation of hospital food by patients was lack of variety with (60.11%) of the patients reporting this. Most of the patients (> 50%) had lower satisfaction with nutrition care quality particularly elements of nutrition care. Data from health care staff revealed there was a disconnect and poor collaborative working relationships among health care teams, less autonomous nutrition practice, poor patient-centered culture, inadequate staffing; less managerial support actions by the hospital administrations, and inadequate tools, equipment, and resources to ensure the quality of care.

In conclusion, most patients had a normal nutritional status but nutritional assessment and screening were lacking. There was general satisfaction with food and food service but most patients and healthcare staff were dissatisfied with food variety. Most patients were also dissatisfied with the nutrition care services and there was a limited collaboration among the healthcare teams. Therefore, food service and nutrition care should be prioritized and recognized within the hospital as a fundamental part of any hospital routine. All health care teams should be involved in patient's nutrition care and support. Therefore, emphasis on nutrition support teams, inter-disciplinary teams, patient-centered care culture, autonomy, and resource availability should be reinforced in both national and hospital guidelines and integrated within the institutional objectives and strategies as this will enable more positive patient experiences of food service and nutrition care.

## CHAPTER ONE: INTRODUCTION

### 1.1 Background

Globally, 462 million adults are undernourished (World Health Organization, 2014) whereas, global malnutrition among adult patients within the hospital setting has been vastly reported to range between 30% and 50% (Correia *et al.*, 2017; Singh *et al.*, 2006; Wischmeyer, 2011). Awareness and screening for adult malnutrition is lacking in most health institutions in sub-Saharan Africa (Luma *et al.*, 2017). Data on the prevalence of adult malnutrition in hospitalized patients in Kenya is limited.

Hospital-acquired malnutrition can be traced back to Florence Nightingale who wrote about "*starving amongst plenty of food*" when describing hospitalized soldiers during the Crimean War in 1860. A century later, Butterworth, (1974) described malnutrition in hospitalized adults as "the *skeleton in the hospital closet*" which he also referred to as "iatrogenic malnutrition" or the "physician induced malnutrition" and was convinced that this had become a significant factor in determining the outcome of illness of many patients and therefore called for recognition and treatment. Several years later, one still comes across patients in the hospital with signs and symptoms of malnutrition that are left undiagnosed, unrecognized, and poorly treated (Barker, Gout and Crowe, 2011; McCarthy *et al.*, 2019).

Malnutrition is a significant challenge when caring for hospitalized adult patients (Smith *et al.*, 2017). It is associated and directly linked to many adverse outcomes and effects including the rate of patients' recovery, (Kamath *et al.*, 2016), the severity of illnesses (Sahin, *et al.*, 2006; Hartwell and Edwards, 2003), higher rates of infection, higher mortality rates, increased length of stay (LOS) in hospitals and increased health costs (Badosa *et al.*, 2017). Malnutrition is reported to be common amongst inpatients due to patient's disease and psychological factors which may result in poor appetite, low diet satisfaction associated with quality of hospital food including patients not liking the food or feeling that the food is unacceptable (Hartley & Hamid, 2002; Sorensen *et al.*, 2012).

Common hospital routines and services including food services, nutrition, and medical care are provided in hospitals to promote the optimal nutritional status and proper health care for patients (Löser, 2010; Fernando & Wijesinghe, 2017). Hospitalized patients' nutritional status worsens if

the quality of nutrition care and food services provided are poor (Krumholz, 2013; Kuslapuu *et al.*, 2015; Tappenden *et al.*, 2013; Keller *et al.*, 2015). Food service quality entails the provision of good quality food which is vital, therapeutic, and a fundamental right for all patients (McClave *et al.*, 2009). Important aspects of food service include; diet therapy techniques, food production, distribution, and design of meals all of which affect important clinical outcomes in hospitalized patients (Vanderwee *et al.*, 2011; Stanga *et al.*, 2003). Hospital diet and food service quality are therefore important aspects in the management of patients admitted in the hospital wards (Mentziou *et al.*, 2014; Ncube & Nesamvuni, 2019). However, the provision of food to patients is largely left to relatives of the patients and on many occasions, the type, amount, and variety of the diet are not in line with the patient's medical condition (Thibault *et al.*, 2011). This may sometimes lead to inadequate nutrient intake and deterioration of the patient's health status.

On the other hand, nutrition care is a fundamental human right, according to Article 25 of the Universal Declaration of Human Rights (Halvorsen *et al.*, 2016). Nutrition care involves a systematic approach in providing high quality nutrition care using the nutrition care process (Andersen *et al.*, 2018). It consists of a series of actions in line with patient care including nutritional assessment, diagnosis, intervention, monitoring, and evaluation (Vanderwee *et al.*, 2011; Andersen *et al.*, 2018). However, aspects of nutrition care such as; nutrition assessment of patients, documentation of nutrition treatment and care, patient's nutrition monitoring, and follow-up are still inadequate, both on hospital admission and during hospital stay for hospitalized patients (Luma, 2017; Halvorsen *et al.*, 2016; Baker & Wellman, 2005). Other important aspects of nutrition care include; provision of nutrition information and counseling. However, nutrition information is not always properly communicated to the patients (Halvorsen *et al.*, 2016). In addition, nutrition counseling in Sub-Saharan Africa is conducted primarily by volunteers or nurses yet there is minimal effort for capacity building on nutrition (Reinsma *et al.* 2016). This is an indicator that in several clinical settings, the nutrition care practices are still of poor quality.

Intensification of nutrition care and improvement of food service quality especially in inpatient care is justified by the high prevalence rates of malnutrition and the increasing number of admissions in the hospital (Rasmussen *et al.*, 2004; Johansen *et al.*, 2004; Leandro-Merhi *et al.*, 2006). Studies have shown that with improved food service quality and proper nutrition care and support there will be a significant reduction in rates of infections, morbidity, and duration of

Mechanical ventilation, LOS, impaired functional capacity, and more importantly, the overall cost of medical and nutrition care will decrease (Dhaliwal *et al.*, 2014; Villet *et al.*, 2005). Globally, this is reflected in developed countries where nutrition care has received much attention as widely evident from the literature while this is not the case in countries in sub-Saharan Africa such as Kenya as there is little information on the same.

It is against this backdrop that this study sought to examine nutrition care, food service quality, and nutrition status of hospitalized patients at Nakuru Level Five Hospital. This study will also contribute to the literature on nutrition care, food service quality, and nutrition status of hospitalized patients that will help improve health by informing health care providers, stakeholders, and policy makers.

## **1.2 Problem Statement**

Globally, 462 million adults are undernourished (World Health Organization, 2014) whereas, global malnutrition among adult patients within the hospital setting has been vastly reported to range between 30% and 50% (Correia *et al.*, 2017; Singh *et al.*, 2006; Wischmeyer, 2011). Malnutrition if left undiagnosed and unattended has adverse outcomes and effects, including increased severity of illnesses, higher rates of infection, higher mortality rates, increased length of stay in hospitals, and increased health costs (Kamath *et al.*, 2016).

The Kenya health statistics (2011), show that a high number of people access health care services in Kenyan public hospitals. Parts of these health care services they receive include nutrition care and food services. Although proper and adequate nutrition care and food service quality are essential components within a health system that promote the optimal nutritional status and proper health care for patients, (Löser, 2010; Fernando and Wijesinghe, 2017), inadequate attention is given to nutrition care and food service in many health care settings, resulting in poor nutrition care, provision of meals of inferior quality, excessive food wastage and even health risks for patients (Diez-Garcia *et al.*, 2012; Fernando & Wijesinghe, 2017). However, there is dearth information on the quality of nutrition care and food service given to patients in Kenyan hospitals, including Nakuru Level Five Hospital. This study was therefore designed to assess nutrition care, food service quality and nutrition status of hospitalized patients at Nakuru level Five Hospital, Kenya.

### **1.3 Justification**

The leading causes of mortality and morbidity in Kenya include HIV/AIDS, tuberculosis, malaria, respiratory tract infections, accidents, gastroenteritis, and diabetes mellitus. Because of the nature of these diseases, many patients will invariably be undernourished on admission or at high risk of undernutrition during hospitalization (Ministry of medical services, 2010).

Malnutrition is a significant challenge when caring for hospitalized adult patients, (Smith et al, 2017) since it is associated and directly linked to many adverse outcomes and effects including patients' recovery (Kamath *et al.*, 2016). Hospital diet and food service quality are important aspects in the management of patients admitted in the hospital wards (Mentziou et al., 2014; Ncube & Nesamvuni, 2019). This is because most hospitalized patients are dependent solely on hospital food for their nutritional requirements (Stanga et al., 2003). This, therefore, requires hospitals to maintain the quality and nutritional value of the food being served (Fernando & Wijesinghe, 2017).

On the other hand, quality of nutrition care has been reinforced using a systematic approach utilized within medical nutrition therapy which has encouraged consistency in patient care and evaluation of outcome and thus an improvement in healthcare provision (Andersen et al., 2018). A study carried out by Lovesley et al., (2019) in an Indian tertiary hospital on combating hospital malnutrition, indicated that proper nutrition care enhanced progressive decrease in Length of Stay (LOS) and healthcare cost. Improving the quality of health care in Kenya through the provision of better food and nutrition care services will assist in achieving the sustainable development goal number three (SDG 3) which seeks to promote good health and wellbeing (United Nations, 2015). The majority of published studies on nutrition care and food service quality have been conducted in developed countries, however, there is a limited number of published studies on nutrition care, food service quality, and nutrition status of hospitalized adult patients in developing countries especially in Kenya. Upon publication, this study will contribute towards filling that gap. This study will also contribute to improved health by informing healthcare providers, health stakeholders, and policy makers by contributing to the literature on nutrition care and food service quality in Kenya.

## **1.4 Broad objective**

To assess the nutrition care, food service quality, and nutrition status of hospitalized patients at Nakuru Level Five Hospital, Kenya.

### **1.4.1 Specific Objectives**

- i) To assess the nutrition care quality at Nakuru Level Five Hospital, Kenya
- ii) To assess the food service quality at Nakuru Level Five Hospital, Kenya
- iii) To determine the nutrition status and length of stay of sampled adult patients admitted in the hospital in the medical and surgical wards
- iv) To establish the association between nutrition care quality, food service quality, and nutrition status in the hospital.

## **1.5 Hypothesis**

- i) **Ho1:** There is no significant association between nutrition care quality and nutrition status among hospitalized patients at Nakuru Level Five Hospital.
- ii) **Ho2:** There is no significant association between food service quality and nutrition status among hospitalized patients at Nakuru Level Five Hospital.

## **1.6 Aim of study**

This study aims to contribute towards improving the nutrition care and food service quality in health systems and public hospitals.

## **1.7 Purpose of study**

The purpose of this study was to assess nutrition care and food service quality within the hospital setting in order to develop strategies to improve patient care by informing healthcare providers, policy makers, and other stakeholders.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Hospital-acquired malnutrition**

Hospital-acquired malnutrition also known as iatrogenic malnutrition is common among hospitalized patients (Singh et al., 2011; Imoberdorf et al., 2010). It is also a burden on patients and health care facilities (Lisa A. Barker, 2012). Studies done in Latin American countries and Spain have shown that approximately 50% of hospitalized patients are malnourished (Correia et al., 2016; Moriana 2014) The proportion of at-risk patients has been shown to be significantly higher in Kenyan and Ghanaian hospitals (66.2%) than that of the South African hospitals (53.7%) ( $p < 0.001$ ). However, inpatient malnutrition prevalence varies depending on the settings of the health care and the populations (Lim et al., 2012). Despite the reported high prevalence of malnutrition in hospitals, it is not yet recognized as a sickness and is not always diagnosed (Elia, Zellipour & Stratton, 2005; Barker, Gout and Crowe, 2011; McCarthy *et al.*, 2019).

### **2.2 Causes and effects of hospital-acquired malnutrition**

#### **2.2.1 Causes of hospital-acquired malnutrition**

Malnutrition among patients in the hospital is caused by different factors including illnesses, difficulties in feeding, anorexia, and an increase in the nutritional requirements of the patient. Another factor which is called “Ex Novo Malnutrition” includes diet deficiencies in the hospital, metabolic stress to the human body which has been caused by illness, and required periods of fasting due to certain procedures: diagnostic or therapeutic (Alvarez-Hernandez, 2012).

#### **2.2.2 Effects of hospital-acquired malnutrition**

Studies have shown that malnutrition results in delayed wound healing (Banks et al., 2010; Lizaka et al., 2010), increased frequency of complications and severity of infections (Borrelli et al., 2009), as well as high rates of readmission, increase in the duration of hospital stay and mortality rates amongst hospitalized patients (Sanchez et al., 2011). It has also been determined that the impact of hospital-acquired malnutrition on a patient’s health and social costs is significant (Rice & Normand, 2012). In a study conducted in Brazil, it was reported that hospital costs for the public health system were on average 60% higher for the hospitalization and treatment of malnourished patients compared to well-nourished ones (Correia & Waitzberg, 2003). Similarly, a study done in a German hospital has shown that malnutrition is a factor with

a great influence on mortality, morbidity, length of hospital stay, and quality of life. It also showed that malnutrition direct costs approximately amount to 9 billion euros in Germany each year (Löser, 2010).

### **2.3 Nutritional status of hospitalized patients**

Since nutrition and health are synergistic, the nutritional status of an individual is very vital for their health, Field, Johnson & Schley, (2002), and therefore determining the nutrition status of a patient is crucial (Deren *et al.*, 2014). This has been seconded by Kirkland *et al.*, (2013) who highlight the importance of establishing the nutritional status of a patient when in the hospital with the major reason that the nutritional status of some patients may deteriorate while in hospital eventually developing malnutrition. In addition, determining the nutritional status of the patients while in hospital will assist in determining those who are at risk of malnutrition which will prompt the adequate provision of nutrition care or therapy (Aquino and Philipi, 2011; Charney, 2008).

While in hospital, the nutrition status of the patients can be constant, worsen or improve (Braunschwig *et al.*, 2000). Part of nutrition care that is vital for patients is the meals being provided at the hospital which greatly contributes to the nutritional status of an individual. The recovery period is shorter for one with a good nutrition status (Mentziou *et al.*, 2014). On the other hand, a poor nutrition status which is related to a condition and how severe it is, makes the recovery period longer thus a longer time of stay in the hospital contributes to the worsening of the condition (Kondrup *et al.*, 2003).

### **2.4 Nutrition care in hospitals**

Nutrition care involves applying the art and science of nutrition to promote the health and well-being of patients. The process consists of four steps that are connected and each is unique. The first step involves screening of all new admissions for nutritional risks and assessment of at-risk patients to determine their nutrition status. The second step involves nutrition diagnosis which involves defining the problem, etiology, and signs/ symptoms. The third step involves nutritional support, evaluation, and assessment of patient's nutritional needs, development of nutrition plans and goals, and provision of quality meals and other forms of support to the individual patient. The fourth step is monitoring nutrition support and care plan for appropriateness, accuracy, and effectiveness (Ministry of Medical Services, 2010).



However, nutritional care and support of hospitalized patients has been neglected and is not achieved in many hospitals hence standard of nutrition care is compromised. A study conducted by The Council of Europe to review the current practice in Europe highlighted five major problems in the nutritional care and support of hospitalized patients including lack of clearly defined responsibilities; lack of sufficient education; lack of influence of the patients; lack of cooperation among all staff group; and lack of involvement from the hospital management (Beck et al., 2001).

Patient neglect is an issue of increasing public concern in most of our hospital settings as this also compromises the standard of nutrition care in the hospital setting. A systematic review done by Reader & Gillespie, (2013), showed patient neglect referred to as failures of healthcare staff to achieve objective standards of care and uncaring attitudes by staff which directly compromised the standard of care provided. Another reason for the standard of nutrition care being compromised is that only a few hospitals have dietitians and a very few tertiary care hospitals provide nutrition support services to patients' hygiene (Sadaf et al., 2018)

Poor documentation can compromise the standard of nutrition care in hospitals. A study conducted in Norway among 16 nurses in one large university hospital, and 11 nurses and 16 undergraduate nurses in five nursing homes associated with the university hospital showed a lack of nutritional screening, unsystematic and inadequate documentation on admission and during hospital stay. The study also showed inappropriate documentation which created a negative nutritional spiral that led to increased risk of severe health-related complications for elderly patients and hindered nutritional follow-up across health care settings (Halvorsen et al., 2016).

Patients' satisfaction is greatly influenced by the standard of nutrition care in hospitals. A cross-sectional survey conducted in Pakistan among 400 patients concluded that patients were dissatisfied with the food and nutritional services. These included menu items, opportunity of food choice, quantity and quality of food, the physical environment of the wards, and staff hygiene (Stanga et al., 2003; Fallon et al., 2008). Effective nutritional care and support of hospitalized patients during a patient's hospital stay can go a long way toward improving patient outcomes and reducing costs. Better nutritional care of medical patients in Denmark was estimated to hold a cost savings potential reaching approximately USD 22 million (Lassen et al., 2006).

The prospects for improvements in nutritional care are ameliorated if hospital management identifies nutritional care as a priority area (Lassen et al., 2006). A combined 'team- effort' from national authorities and all staff involved in the nutritional care and support, including hospital managers are also needed (Beck et al., 2001). In addition, a good nutrition support team is also essential for the improvement of nutrition care in hospitals. A good nutrition support team should consist of a multidisciplinary team (Derenski& Daniel, 2015). A multidisciplinary nutrition support team is an important intervention for an individual patient (Nightingale, (2010), and an effective way of substantially improving the quality of (Norcini et al., 2011). A study conducted in Korea on impact and outcomes of nutritional support team intervention in patients with gastrointestinal disease in the intensive care unit where forty- four (71.0%) patients received nutritional support in ICU and 18 (29.0%) did not, revealed that the Nutrition Support Team interventions are beneficial to decrease mortality in the acutely ill patients (Park et al., 2017).

The quality of nutrition care can also be improved if a health care staff or worker has the necessary resources and manpower to perform nutritional care in practice. These resources include time, adequate nutritional supplements and equipment, and tools for nutrition assessment. Lack of or inadequate supply of these resources may adversely affect the quality of care. A study conducted in five teaching hospitals in Shiraz, Iran among twelve participants concluded that Imbalanced workloads, inappropriate nurse-patient ratios, and inadequate physical resources negatively affected nurse's perceptions of the quality of the nursing practice environment (Rivaz et al., 2017). Similarly, another study conducted in a Tanzanian hospital on a total of 27 health workers revealed there were shortages of functioning medical equipment and/or essential medicines and supplements, delays in payment to the suppliers of drugs and equipment, and long procedures to request out-of-stock medicines were perceived as factors impacting on the delivery of quality of care (Khamis & Njau, 2016).

Nutrition care entails proper monitoring and follow-up of patients. Timely outpatient follow-up has been promoted as a key strategy to reduce hospital readmissions. One-half of patients readmitted within 30 days of hospital discharge do not have follow-up before the readmission. Guidance is needed to identify the optimal timing of hospital follow-up for patients with conditions of varying complexity (Jackson et al., 2015).

Adequate and timely implementation of nutritional support as part of nutrition care has been linked with favorable outcomes such as a decrease in length of hospital stay, reduced mortality, and reductions in the rate of severe complications, as well as improvements in quality of life and functional status (Reber et al., 2019).

## **2.5 Hospital food and food service**

In the 5<sup>th</sup> Century Before Christ (BC), Hippocrates stated that one key therapeutic factor during sickness is food. Food provided in the hospital is significant and contributes to undernutrition prevention or limits its development during patients' stay in the hospital. Feeding patients at the hospital is also an essential element to ensuring the quality and comfort offered by the hospital. Meals and snacks should meet the patient's nutrition needs and food expectations (Thibault et al., 2011).

The main cause of iatrogenic undernutrition is reduced dietary intake during the hospital stay. Hospital under nutrition causes an increase in energy requirements which worsens the situation. Decreased food intake is associated with increased complications and mortality during hospital stay (Thibault et al., 2011). Sufficient nutrient intake among inpatients is therefore vital for effective treatment and a short recovery period. A Cross-sectional study conducted in a general hospital located in São Paulo, Brazil, among 300 adult individuals, reported that inadequate food intake among inpatients was the main risk factor of malnutrition (Aquinno & Philipi, 2011).

Reasonable costs of production and distribution of food, patient's satisfaction, and coverage of patients' nutritional needs in terms of caloric intake are compromised due to financial constraints, untrained staff, missing links between patients, caterers, and clinical teams, and consumer surveys not carried out to evaluate patients' satisfaction levels (Agarwal et al, 2012; Tappenden et al., 2013; Pullen et al., 2018; Poulsen et al., 2007).

Although maximum nutritional intake forms an integral part of therapeutic treatment of malnutrition, it was noted that only two studies conducted in Australia described the food intake trends of patients. One study reported that on average, the energy consumption of over one-third of their participants was less than 50 percent of that provided in standard hospital diet main meals. This was after an investigation was done on the nutritional intake of acute care patients (Agarwal *et al*, 2012).

However, information on the nutritional status of the participants was not captured. In another study, it was found out that on average nearly 50 percent of patients reported eating half or less of their meal were found to be up to four times more likely to be malnourished compared to those who ate more than half of their meal (Bauer et al., 2011).

There are several efforts to improving the hospital meal service. Apart from carrying out a nutritional assessment to identify those at nutritional risk, monitoring of food intake can be done to ensure that patients get the correct type and amount of food appropriate to meet their needs. In addition, meeting the patients' expectations and improving their food intake would entail adapting hospital menus and ensure a conducive atmosphere during mealtime. (Thibault *et al*, 2011). A study conducted in hospitals in Lahore, Pakistan showed that patients were dissatisfied with the food and nutritional services and noted that patients' satisfaction surveys on hospital food service quality were not done hence concluded that it should be done periodically and should establish a food service department, appoint dietitians for planning and food service managers and personnel to provide food service to the patients to improve quality of care. Therefore, it is very important to carry out regularly a consumer evaluation of food intake of hospitalized patients to improve clinical outcomes and reduce the risk of under-nutrition and health costs involved (Sadaf et al., 2018).

## **2.6 Association of nutrition care, food service quality and nutrition status**

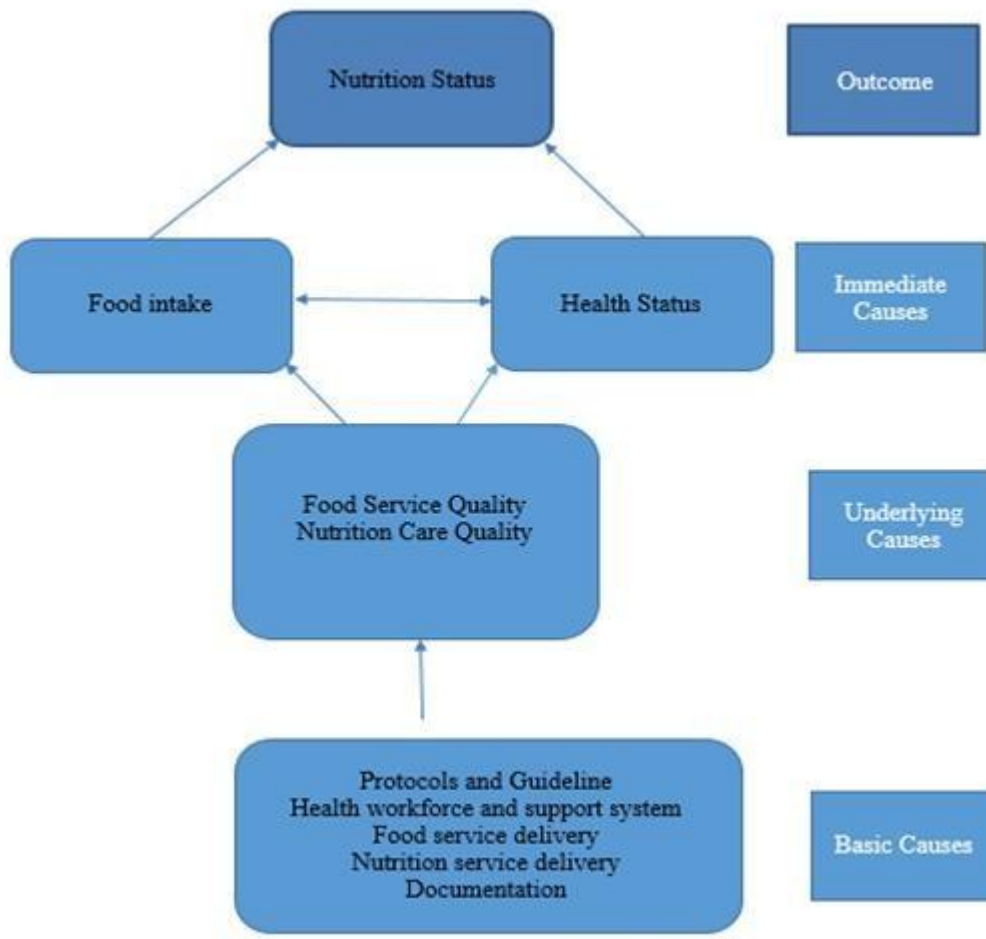
The impairment of the nutritional status of hospitalized patients is closely associated with, among other factors, the incorrect execution of basic actions in nutritional care (Pasquini et al., 2012). Malnourished inpatients have an impact on hospitalization costs and length of stay therefore an effective nutritional intervention in patients is crucial (Leandro-Merhi, de Aquino & Chagas, 2011; Norman, 2008; Amaral et al., 2007; Caccialanza et al., 2010). Despite numerous advances in medicine and clinical care, the simple correction of a patient's nutritional status appears to be overlooked or not considered as a sufficient medical priority (Savadojo et al., 2019).

Part of nutrition care involves nutrition assessment, diagnosis, counseling including proper documentation and proper follow-up. The treatment of malnutrition first requires a malnourished patient to be identified via screening or assessment and this needs to be done on admission, and preferably made mandatory by health care accrediting bodies. (Barker, Gout & Crowe, 2011).

Hospital malnutrition (Waitzberg, 2001; Penie, 2005) and the increasing prevalence of hospitalized patients (Leandro-Merhi, 2011; Sichieri, 2007; Macinko, 2011) require hospital improvements in food and nutritional care quality. When meals are carefully planned and served and when patients consume what they are served, these goals can be achieved [Hong,1996, Kim, 2008]. Meal consumption of in-patients is a good indicator of dietary status and satisfaction with meal service (Hong,1995). Furthermore, foodservice quality is known to influence patients' satisfaction with hospital stays (Demir, 2002; Sheehan-Smith, 2006).

## **2.7 Conceptual framework**

The basic causes within the conceptual framework represent the thematic areas discussed that affect the food and nutrition care quality which potentially affects the outcome. Other causes that affect the nutritional status outcome include underlying causes such as food service and nutrition care quality and immediate causes such as patient's food intake and health status.



**Figure 2. 1: Conceptual framework (UNICEF, 2013)**

## 2.8 Gaps in knowledge

The literature review demonstrated that nutrient intake is inadequate among inpatients, low diet satisfaction is a global problem associated with poor quality of hospital food and despite malnutrition being prevalent, the condition is under-diagnosed. Apart from confirming the existence of the above problems and issues, current literature review has demonstrated that there is limited literature on nutrition care quality and food service quality especially in sub-Saharan Africa including Kenya and specifically Nakuru County.

This study, therefore, seeks to fill the knowledge gap that has been identified in a developing country, Kenya as far as nutrition care, food service quality, and hospital malnutrition among adult patients is concerned.

## **CHAPTER THREE: METHODOLOGY**

### **3.1 Study Design**

A descriptive cross-sectional study design with both quantitative and qualitative methods of data collection was used. Data was collected on nutrition care and food service quality in Nakuru Level Five hospital amongst adult male and female inpatients and healthcare staff in surgical and medical wards of Nakuru County, between August to November 2018.

### **3.2 Study Site**

The study was based at Nakuru Level Five hospital, Nakuru County. Nakuru County is one of the 47 counties of the Republic of Kenya. The county lies within the great rift valley and borders eight other counties namely; Kericho and Bomet to the west, Baringo and Laikipia to the north, Nyandarua to the east, Narok to the south-west and Kajiado and Kiambu to the south. The county has 9 sub-counties and covers an area of 7,495.1 Km<sup>2</sup> and is located between Longitude 35 ° 28` and 35° 36` East and Latitude 0 ° 13 and 1° 10` south. The county headquarter is Nakuru Municipality. The total population of Nakuru County stood at 2,162,202 in 2019 comprising 1,077,272 males and 1,084,235 females as per the projections of the Kenya National Population and Housing Census of 2009. Nakuru county's key source of livelihood is crop and dairy farming. The main food crops cultivated are maize, beans, Irish potatoes, carrots, peas, tomatoes, and wheat whereas the major cash crops are flowers, wheat, barley, and pyrethrum. The livestock kept are cattle, sheep, and goats, and poultry such as chicken is also reared.

The annual temperature ranges between 20°C to 30° C and the mean annual rainfall ranges between 1,000 and 1,800mm (GOK, 2002; CBS 1999; GOK, 2009). Nakuru Level Five hospital is the main and the largest county government referral hospital in Nakuru County. (Figure 3.1)



**Figure 3. 1: Location of Nakuru County in Kenya (KNBS, 2013)**

### **3.2.1 Hospital Background**

Nakuru Level Five Hospital is located in Nakuru town, Nakuru East of Nakuru County approximately near the Nakuru- Nairobi Highway. It was founded in 1906 and is one of the largest government referral hospitals serving most of the parts in the rift valley and neighboring counties. The hospital serves a population of about 3.6 million in the south Rift valley and patients coming as far as Nyanza, North Rift valley, and the Central part of Kenya (Nasio, 2017).

It has a bed capacity of 622. The average bed occupancy rate is above 100%. The hospital has more than 10 wards and several outpatient clinics. The average out-patient attendance is 11,000 patients per month while the average inpatient admission per month is 1,200 and an average monthly admission of 1422 patients. The mean Length of Stay (LOS) is 7 days. (DHIS, 2017).



Nakuru Level Five hospital was selected as it is a referral facility for the region and hosts a high proportion of the county's as well as its neighboring population. It also has specialized services including both in-patient and out-patient medical services. This hospital also receives patients from different socio-economic status and is considered representative of patients from both rural and urban areas. This study was conducted at the medical and surgical wards including the kitchen unit of Nakuru Level Five hospital.

### **3.2.2 Study participants**

The study participants included adult patients, both male, and female between the ages of 18 and 65 years admitted for a minimum of one week in the medical and surgical wards. The study also included healthcare staff that had been working for at least one year in the medical and surgical wards and the kitchen section.

### **3.2.3 Inclusion and Exclusion Criteria for patients and health care staff**

#### **Inclusion Criteria for healthcare staff**

- a) Staff working in the medical and surgical wards and kitchen for at least one year and were willing to participate in the study

#### **Inclusion Criteria for patients**

The inclusion criteria used for the selection of patients entailed that:

- a) Patients should be aged 18 years and/or above
- b) Patients admitted for a minimum of 1 week
- c) Patients give consent to participate in the study

#### **Exclusion Criteria for health care staff**

- a) Student interns were excluded from the study

#### **Exclusion Criteria for patients**

Those excluded included:

- a) Non-ambulatory patients
- b) Critically ill patients

### 3.3 Sampling

#### 3.3.1 Sample size determination

A sample of 384 patients was obtained based on Fischer formula (1991) with a 95% confidence interval used. It was then adjusted since the population in the hospital (1200) was less than 10,000

$$n = \frac{Z^2 * pq}{d^2}$$

n = the desired sample size

Z = 1.96 which corresponds to the 95 percent confidence level.

p = the proportion in the target population estimated to have malnutrition. This will be estimated at 0.5 since the prevalence is not known

q = 1-p

d= degree of precision set at 0.05

Where;  $n = \frac{1.96^2 * 0.5 * (1 - 0.5)}{0.05^2}$

$$0.05^2$$

$$n = 384$$

This gave a sample size of 384 subjects/patients

However, given that the patient population in the hospital was less than 10,000, the final sample size was calculated using an adjusted Fischer formula below;

$$nf = n | 1 + (n / N)$$

Where:

$n_f$  = the adjusted sample size (when the population is less than 10,000).

n = the desired sample size (when the population is more than 10,000).

N = the estimate of the population size (in this case 100 patients admitted per month to the hospital).

$$nf = 384 | 1 + (384 / 311) = 171 \sim 170$$

$$nf = 171 + (10\% \text{ non-response rate})$$

$$nf = 171 + (0.1 \times 171)$$

$$nf = 171 + (17.1) = 188$$

Sample size = 188 patients

A total of 15 key informants were interviewed. This number was chosen because it has been suggested that, 15- 35 interviewees who are well informed or experts in the subject are suggested as sufficient when conducting Key Informant Interviews (Kumar, 1989). The key informants included the chief nutritionist (1); nutritionists (4), nurses (4), and doctors (4) from both surgical and medical wards; kitchen nutritionist (1) and chief cateress (1). Both the adult patients and the health care staff were consecutively and purposively sampled respectively.

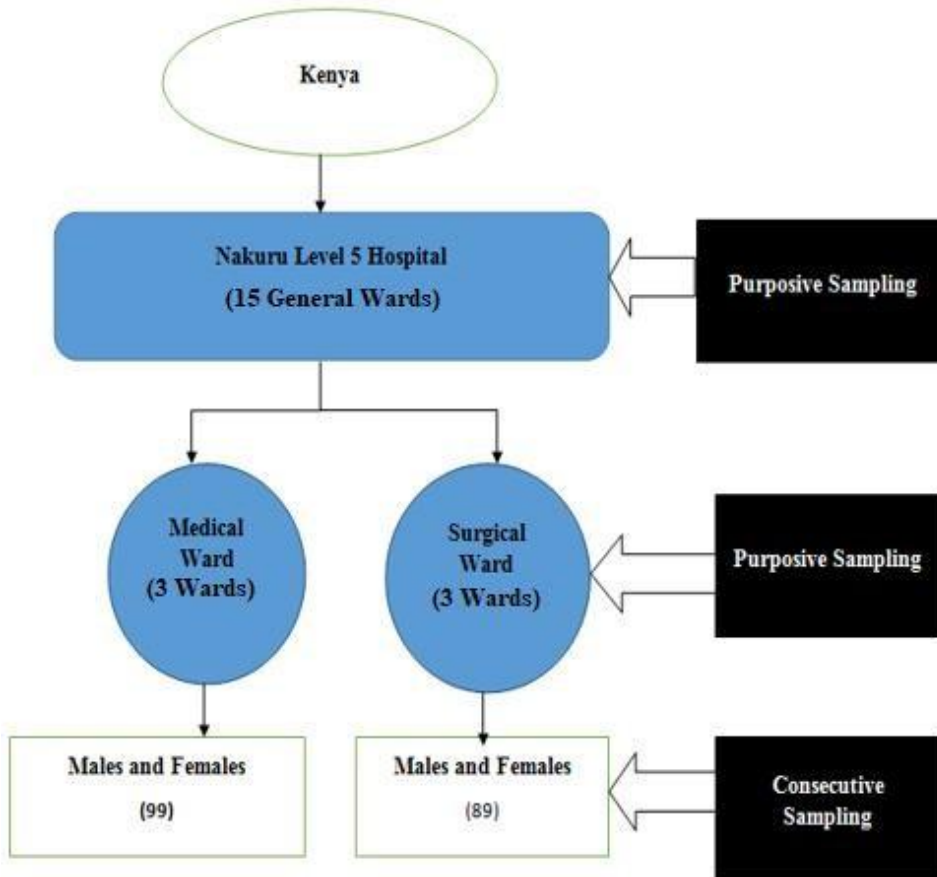
Consecutive sampling of the 188 patients (medical: 99 patients and surgical: 89 patients) entailed every patient meeting the inclusion criteria being selected until the required sample size was achieved while the key informants were purposively sampled since they met the requirements of being health care staff and their roles were directly or indirectly related to the medical and surgical wards.

### **3.3.2 Sampling Procedure**

Nakuru Level Five Hospital was purposively selected since it is the largest referral hospital in Nakuru County and serves a high proportion of the county's as well as its neighboring population thus more representative.

Medical and surgical wards were also purposively selected. These two wards had patients admitted with varying medical conditions; they formed a large proportion of the in-patients and had inpatients on longer lengths of stays. Given the variation in medical conditions, it was assumed this would give a better picture of nutrition care and food service quality.

The sampling frame consisted of adult patients both male and female admitted in medical wards and surgical wards. The patients in these wards were selected using consecutive sampling method in which every subject meeting the criteria of inclusion was selected until the required sample size was achieved. The sampling frame also consisted of health care staff (doctors, nutritionists, nurses) in the medical and surgical wards that had worked for at least one year. Health care staff was purposively sampled since they were key informants (Figure 3.2). The number 15 was so that there was a good representation from each type of staff as mentioned above in the medical and surgical wards and information was collected to saturation.



**Figure 3. 2: Sampling procedure scheme that was used during the study**

### 3.4 Data Collection Procedure

#### 3.4.1 Preparatory phase

Approval to conduct the study was sought from the Graduate School at the University of Nairobi. Ethical clearance was obtained from KNH-UoN Ethics Research Committee board. Permission to conduct the study was obtained from the Nakuru Level Five Hospital management. The hospital management was also briefed on the study objectives and the detailed plan for the study implementation.

Four research assistants were recruited and trained. They were holders of a Bachelor’s degree in Food Nutrition and Dietetics and priority was given to those who had prior experience in data collection with basic computer, communications, writing, and research skills. The research assistants were trained intensively for two days (Appendix 7) on how to administer the questionnaires and conduct interviews with respondents.

During training the following points were emphasized;

- i. Ensuring proper ethics while conducting research
- ii. Ensuring all participants met the inclusion criteria
- iii. Ensuring all participants consented to participate in the study
- iv. Clarity when asking questions
- v. Accuracy and precision when interviewing and filling in the questionnaires
- vi. Ensuring detailed probing
- vii. Being patient while interviewing
- viii. Liaising with other research assistants if something was not clear soon after administering the questionnaire
- ix. Correct taking of measurements (weight, height, and MUAC)

The training was conducted through role-plays which involved simulation of a patient and interviewer by the research enumerators. Filled out questionnaires were checked and errors were pointed out. The training was also conducted through demonstrations which involved taking actual measurements of MUAC, weight, height and calculating the BMI using the weight and height data.

### **3.4.2 Pretesting phase**

The research instruments were pre-tested at Naivasha Level Five Hospital in Nakuru County, Kenya. This was done after having received ethical clearance of the study and approval from KNH-UoN Ethics Research Committee board and the hospital management respectively. The hospital was selected based on the fact that patients had similar characteristics as those in Nakuru Level Five Hospital. 25 adult patients and 10 health care staff were sampled for pre-testing. The procedures that were used during the pre-test of the research instruments were the same as those that were used in the main research. The feedback from the pretest was used to modify the questionnaire that was used in the actual study. It also helped the researcher and her assistants to familiarize themselves with the data collection instruments and use of the measuring tools and equipment. Pre-testing also helped to reasonably allocate time for each questionnaire of about 30 minutes each.

### **3.4.3 Data collection phase**

Data collection commenced in August 2018 and data was collected daily from 8:00 am to 4:00 pm until September 2018. Semi-structured, pretested, and modified questionnaires were used to collect data from 188 patients in medical and surgical wards. Key informant interviews were conducted on 15 healthcare staff.

#### **3.4.3.1 Consenting Procedure**

Eligible patients were identified from the medical and surgical wards using the inclusion criteria. The principal investigator assisted by the research assistants introduced themselves individually to the participants, explained the purpose of the study, and sought informed consent from them. Data collection from the individual patients was then conducted. This was also done for the health care staff where eligible staff who met the inclusion criteria was identified.

Information obtained was then recorded in the questionnaires. Completed questionnaires were then collected at the end of each day, cross-checked, and stored carefully by the principal investigator which was later kept in a locked safe.

#### **3.4.3.2 Data Collection Methods, Tools, Instruments, and Equipment**

##### **Data collection methods**

Interviews were used to collect and obtain information from both the patients and health care staff. A review of patients' documents and visits to the hospital kitchen was also conducted and anthropometric measurements were done.

##### **a) Review of patient profile data**

For each patient file retrieved, the following information was checked and recorded on the study questionnaire; date of admission, gender, age, marital status, and any reference to nutrition status assessment such as weight done to the patient. In addition, diet prescribed information if available was recorded into the patient questionnaire. If any of the target information was missing, the patient was interviewed and the questionnaire was filled accordingly.

##### **b) Review of documents**

Sample menus, patients' records, and other helpful data within the wards including the nutritional care plan sheets were looked at

### **c) Semi-structured interviews for patients**

Eligible patients were identified from the medical and surgical wards using the inclusion criteria. The following data were collected: demographic, socio-economic, education and household characteristics, and nutrition assessment, patient's satisfaction with hospital food and food service and nutrition care services, patients experience and challenges, patient's expectation of nutritionists, supplementation of hospital food and food frequency intake.

### **d) Key Informant Interviews**

In-depth interviews were conducted with 15 health care staff. The purpose of the key informant interview was to obtain general information on demographic information, hospital characteristics, structure of the hospital nutrition unit, work data, activities of dieticians in hospital units, hospital diet characteristics, satisfaction with food and food service, nutrition care service; nutrition practices, experience and challenges, and information on the knowledge attitude and experiences of nutritionists. The key informants who participated included the chief cateress, chief nutritionist, four nutritionists working in the wards, one nutritionist working in the kitchen, 4 doctors, and 4 nurses. A total of 15 key informants were interviewed.

### **e) Nutrition Status Assessment**

#### **i. Body Mass Index Determination**

To determine the nutrition status of the patient, BMI was used as indices of nutritional status. Weight and height measurements were taken following the procedures outlined in the clinical nutrition manual (Kimani & Sharif, 2009). Weights were taken by requesting the patient to stand upright on a SECA electronic weighing scale which was placed on a flat surface. The patients were requested to be in very light clothing in order to take the weight measurement as accurately as possible. The weight measurements were done three times and then recorded in the study questionnaire then an average was calculated and recorded. After taking the weight, a patient would be asked to stand on a stadiometer and his or her height was taken. The height measurements were taken three times to ensure accuracy and an average calculated before computing for Body Mass Index (BMI).

The data obtained were used to calculate the BMI and classify the patients' nutrition status under any of the four categories; Obese ( $\geq 30$ ), Overweight (25-29.9), Normal (18.5 – 24.9), and Underweight ( $< 18.5$ ) (Ministry of Medical Services, 2010).

## **ii. Mid-Upper Arm Circumference Determination**

Mid- Upper Arm Circumference measurements were carried out three times using a standard adult MUAC tape. MUAC measurements were taken following the procedures outlined in the National Guidelines for Integrated Management of Acute Malnutrition. The MUAC measurements were taken to the nearest 0.1cm. The data obtained were used to classify the patients' nutrition status under any of the three categories; under nutrition (<23 cm), Normal (23 ≤ to 32 cm), Overweight/ Obese (>32 cm) (Kimani & Sharif, 2009; Chakraborty, Bose & Bisai, 2009).

## **f. Visits to hospital kitchens**

The Central Production Unit where food is prepared was visited. This was with a view to gather valuable information and getting a clear picture regarding the hospital's total food service delivery system.

## **Data Collection Instruments, Tools, and Equipment**

The main tools for data collection were; semi-structured questionnaires, weighing scales for weight taking, a stadiometer and tape measures for height taking and MUAC tapes for Mid-Upper Arm Circumference measurement.

## **Questionnaires for Patients**

The patient semi-structured questionnaires (Appendix 6) consisted of several sections; Section on socio-demographic characteristics including patient profile data/ information where some of the information was retrieved from the patient file, and nutrition assessment, patients' perception with hospital food, food services, and nutrition care services. The patients' perceptions assessed included their satisfaction with hospital food, food services, and nutrition care services, their experiences, challenges, and their expectations towards nutritionists. The questionnaire also contained information on the supplementation of hospital food if any and information.

Five-point Likert rating scale questions were used to assess patient satisfaction. The points associated with each scale were as follows; 1=very dissatisfied, 2 = dissatisfied, 3 = fairly satisfied, 4 = satisfied, 5 = very satisfied. Patients who were "very dissatisfied" and "dissatisfied" were grouped and considered dissatisfied, while those who were "satisfied" and "very satisfied" were regarded as satisfied and those who were "fairly satisfied" remained the same (De-Simone



& Esposito, 2014; Abdelhafez et al., 2012; Qadri et al., 2012; Goel et al., 2014).

**a) The food frequency questionnaire (FFQ)**

A food frequency questionnaire was used to assess the frequency of foods/meals consumed from each food group weekly. The list of foods in the FFQ was sufficiently extensive to show dietary diversity. The questionnaire was administered to all patients. The FFQ had four columns, a list of foods from each food group, frequency of consumption, the source of food whether internally sourced within the hospital or externally sourced. The foods included those that were readily sourced in the hospital and those available in the locality.

**b) Key Informant Interview Guide**

A comprehensive structured key informant interview guide (Appendix 5) was used to obtain information from the key informants. The questions were adopted from several studies (Diez-Garcia et al., 2012; Abdelhafez et al., 2012) and were modified and used to collect information from health care staff. The guide was divided into 12 sections. Each section had tailored questions and themes to suit the different cadres.

**c) Electronic Weighing Scales**

The weights of the patients were determined using an electronic weighing scale which measured to the nearest 0.1kg and manufactured by SECA Company in Germany.

**d) Stadio-meters/ Tape measures**

The patients' heights were taken using stadiometer manufactured by SECA Company and recorded to the nearest 0.1cm. However, tape measures were used in some cases.

**e) Mid Upper Arm Circumference (MUAC) tapes**

MUAC measurements were taken using a standard adult MUAC tape.

### **3.5 Validity of the instruments**

Validity was ensured through the use of already validated tools. The questionnaires were adopted and modified from those used in other (De-Simone & Esposito, 2014; Abdelhafez et al., 2012; Qadri et al., 2012; Goel et al., 2014; Diez-Garcia et al., 2012). To guarantee internal validity, all steps of the research process were followed judiciously. Content validity was established by working closely with university supervisors and chief nutritionists at Nakuru Level Five Hospital.

### **3.6 Reliability of the instruments**

The retest method was used to determine the reliability of the instruments during the pretest. The collection of data was done at least twice during the pretest at Naivasha Level Five hospital.

### **3.7 Ethical Consideration**

Approval was sought from Graduate School at the University of Nairobi. Ethical clearance and approval to conduct the research at Nakuru Level Five hospital was obtained from KNH-UoN Ethics Research Committee board. Permission and authority to conduct the study was obtained from the Medical Superintendent in Nakuru Level Five Hospital.

Informed voluntary consent (Appendix 4 and 5) was obtained from all the participants before collecting any data. Permission to check the patients' medical record files for socio-demographic.

Characteristics were sought from the participants. The participants were briefed on the study objectives, procedures, risks, benefits and schedule. In order to assure anonymity and confidentiality, the names of the participants were not recorded in the questionnaires. However, initials were used. Participation was voluntary and every participant consented to participate in the study. All participants appended their signatures in the consent forms and a copy left to each participant.

### **3.8 Data Quality Control and Management**

In the design phase, before the data collection process was carried out, each data item was well defined, and methods that were used to collect data were chosen. The decision on which data to be collected was made in line with the already available resources.

In the data collection phase, standard, modified questionnaires were prepared. The questionnaires were then pilot tested and revised to ensure the quality of the data collected and prevent errors during the actual research. Adequate training of the data collection team was done. This involved correctly filling out the questionnaires to enhance data validity. Equipment for weight and height measurements was calibrated with standard measurements of a 5-kilogram bar every day before the start of the interview. In addition, random checks by the principal investigator were conducted throughout the research. Filled questionnaires were also checked for completeness and accuracy in recording as well as legibility. Data on the semi-structured interview questionnaire were input into a created electronic database (SPSS and Microsoft excel sheet) apart from the hard copy to prevent loss of data by ensuring back-up, prevent errors, save on time and ensure quick data cleaning.

In the data management phase, simple statistical methods were used to review data and to identify any potential errors. Questionable or missing data arising from these simple statistics were thoroughly investigated and verified. Immediate review of the questionnaires was done which allowed timely identification of any missing data or information. At the end of a day's data collection, the questionnaires were exchanged and revisited to prevent errors and missing data. Each person had their initials in each of the questionnaires he/she cross-checked. The review of collection forms was also performed at the time of data entry with immediate reporting of problems to the principal investigator. Data were keyed in by two independent people in the data analysis phase, any outlier data was managed where the outlier data values were removed or adjusted in some instances. However, in some instances, they were neither adjusted nor removed and were allowed to fully influence the overall results. P-values and/ or confidence intervals were used to convey the precision of the results and an appropriate statistical model for analysis was chosen for various variables.

### **3.9 Data entry, Cleaning, and Analysis**

All patients' data were coded and entered in the Statistical Package for Social Sciences, version 21.0 (SPSS 21.0) electronic base while the health care staff data were entered in a Microsoft Excel sheet. This data was then imported in CSV format to R and Stata software where it was cleaned and analyzed.

Descriptive statistics in terms of means, frequencies, percentages, median and standard deviations were generated for demographic (age, sex, marital status), socio-economic characteristics (education level, occupation, income level), food frequency, diet satisfaction, and nutrition status. Association between the quality perception of food, nutrition services, and the nutritional status of patients was measured using chi-square test and fisher's exact where applicable.

Key Informant Interviews with the health workers were recorded in the questionnaire. Data were then entered in excel and thematic analysis was used and information was transferred to a word document. Thematic analysis of the data was done by the researcher and another expert in the field separately.

The results were then presented in the form of tables, graphs, and narratives. The outcomes were: nutritional status of the patients, quality perception of food services, and nutrition services.

### 3.10 Data analysis matrix

**Table 3. 1: Data analysis matrix**

Data collection tool	Target population	Variables	Nature of variables	Data analysis method
1. To evaluate perceived quality of nutrition care and food service among hospitalized patients				
Semi-structured questionnaire	Patients in the surgical and medical wards admitted for 1 week or more (18-60 years)	Socio-demographic characteristics (age, sex, educational level, occupation and monthly income)  Perceived quality of nutrition care and food service (satisfaction scores on food service and nutrition service qualities such as temperature of food, taste, type, variety, meal composition etc.)	Continuous Categorical	Descriptive statistics for continuous data -mean, median, standard deviations, standard error and percentages  Independent t-tests for comparison of surgical and medical patients to see if there was a significant difference in the continuous data e.g. age variable
2. To evaluate perceived quality of nutrition care and food service among health workers				
Key Informant Interviews	Health workers in the medical and surgical wards who have worked for more than a year	Perceived quality of nutrition care and food service (satisfaction scores on food service and nutrition service qualities such as temperature of food, taste, type, variety, meal composition etc.)	Categorical	Thematic analysis and presentation  Descriptive statistics for the quantitative questions: frequencies and percentages on the Likert-scaled questions
3. To determine the nutritional status of adult patients admitted for a minimum of one week				
Semi-structured questionnaire (BMI)	Patients in the surgical and medical wards admitted for 1 week or more (18-60 years)	Weight, Height, MUAC and BMI  Patients' files	Continuous Categorical	Descriptive statistics: mean, median, standard deviations, percentages  Independent t-tests for comparison of surgical and medical patients to see if there was a significant difference in their nutritional status. Also male vs female patients
4. To determine the association between nutrition care, food service quality and nutrition status at Nakuru Level Five Hospital.				
Semi-structured questionnaire	Patients in the medical and surgical wards			Chi square tests and fisher's exact test-to measure association of the food service quality, nutrition service

## CHAPTER FOUR: RESULTS

This chapter presents analysis and research findings derived from the study. Data was collected from both patients and hospital staff. The results were then presented in the form of tables, pie charts, box plots, and graphs.

A deductive approach was used to theorize information collected from health care staff. The information obtained was presented using this approach in a conceptual framework adapted from UNICEF (2013). Appendix 1 shows the conceptual framework adapted.

The basic causes within the conceptual framework represent the thematic areas discussed that affect the food and nutrition care quality which potentially affects the outcome. Other causes that affect the nutritional status outcome include underlying causes such as food service and nutrition care quality and immediate causes such as patient's food intake and health status.

The study participants consisted of 188 patients who were admitted in the hospital for a minimum of 1 week and were aged between 18 and 64 years. The mean length of stay for the admitted patients was 4 weeks. A total of 99 (52.66%) of the patients were from the medical wards and 89(47.34%) from surgical wards.

According to Table 4.1, male patients were the majority in the study 103 (54.79%); 49 (49.49%) were from the medical ward, whereas 54(60.67%) were from the surgical ward. Female patients were 85(45.21%); 50 (50.51%) were from the medical ward and 35(39.33%) were from the surgical ward. The mean age of the study participants was 36 years, with the majority being 18-34 years of age (54.79%), and very few above 60 years (5.85%). Most participants were married (57.45%) and had attended secondary (37.23%) and primary education (36.70%). Self-employment among participants was reported to be the highest (28.72%) with a monthly individual income of Kshs 10,000 and a monthly household income of Kshs 15,000.

The study participants also consisted of health workers from all cadres whose work stations included the kitchen section, medical wards, and surgical wards. A total of 15 health workers were consecutively sampled.

Female participants were the main respondents n=9 (60%) and n= 6 (40%) were males with a mean age of 38.4 years. Most participants were single n=8 (53.33%) followed closely by those who were married n=6 (40%). A high number had attained a bachelor's degree n=7 (46.67%) (Table 4.2).

**Table 4. 1:Socio-demographic and economic characteristics of patients**

Characteristics	N=188
<b>Patients' characteristics</b>	
Male, n (%)	103 (54.79)
Female, n (%)	85 (45.21)
Mean age in years (SD)	35.74 (12.50)
<b>Age categories, n(%)</b>	
18-34	103 (54.79)
35-60	74 (39.36)
>60	11 (5.85)
<b>Marital status, n (%)</b>	
Single	52 (27.66)
Married	108 (57.45)
Separated	12 (6.38)
Divorced	7 (3.72)
Widowed	9 (4.79)
<b>Education, n (%)</b>	
None	21 (11.17)
Primary	69 (36.70)
Secondary	70 (37.23)
Tertiary	28 (14.89)
<b>Employment, n (%)</b>	
None	43 (22.87)
Full time	38 (20.21)
Part-time	25 (13.30)
Self-employment	54 (28.72)
Casual laborer	28 (14.89)
<b>Monthly Income</b>	
Median monthly individual income in Kshs [IQR]	10000 [3500 – 17000]
Median monthly household income in Kshs [IQR]	15000 [8000 – 30000]
<b>Length of hospital stay</b>	
Mean length of hospital stay in weeks (SD)	4.48 (8.86)
<b>Ward</b>	
Total n (%)	99 (52.66)
Male n (%)	49 (49.49%)
Female n (%)	50 (50.51%)
<b>Medical</b>	
Total n (%)	89 (47.34)
Male n (%)	54(60.67%)
Female n (%)	35(39.33%)
<b>Surgical</b>	

**Table 4. 2:Socio-demographic characteristics of health workers**

<b>Health workers' characteristics</b>	<b>N=15</b>
<b>Participants' characteristics</b>	
Female, n (%)	9 (60)
Male, n (%)	6 (40)
Mean age in years (SD)	38.4 (10.20)
<b>Marital status, n (%)</b>	
Single	8 (53.33)
Married	6 (40.00)
Separated	1 (6.67)
<b>Education, n (%)</b>	
Certificate	1 (6.67)
Diploma	2 (13.33)
Bachelors	10 (66.67)
Masters	2 (13.33)

#### **4.1 Nutrition care quality: Patients**

The following presents patients' perceptions on nutrition care quality.

##### **4.1.1 Nutrition care practices and services perception by patients**

Most participants reported that they were satisfied with nutrition care with responses of above 60%. However, a number voiced their concern with more than 50% of the respondents dissatisfied with nutrition information provided 140(74.47%), nutrition education on management of patients condition 135(71.81%), and respect for patients' privacy and confidentiality 130 (69.15%). Almost 50% of the study participants were also dissatisfied with the nutritionists' response in dealing with patients' anxiety and stress (Table 4.3)



**Table 4. 3: Nutrition care practices and services perception by patients**

	n=188 (100%)		
	Dissatisfied	Faily Satisfied	Satisfied
Nutritionists welcoming patients at first time contact	45.00 23.94%	88.00 46.81%	55.00 29.26%
The way nutritionists speak to Patients	17.00 9.04%	48.00 25.53%	123.00 65.43%
The way nutritionists listen to patients worries and concerns	16.00 8.51%	47.00 25.00%	125.00 66.49%
The way nutritionists treat patients as individuals	20.00 10.64%	37.00 19.68%	131.00 69.68%
Nutritionists willingness to respond to patients worries and concerns	20.00 10.64%	41.00 21.81%	127.00 67.55%
Nutrition Information provided by nutritionists in the ward	140.00 74.47%	33.00 17.55%	15.00 7.98%
Nutrition education on management of patients Condition	135.00 71.81%	30.00 15.96%	23.00 12.23%
Respect for patients privacy and confidentiality	130.00 69.15%	41.00 21.81%	17.00 9.04%

**4.1.2 Experiences and challenges by patients on nutrition care services**

Table 4.4 shows the overall responses of patients on their experiences and challenges on the nutrition care process during the delivery of nutrition services. The majority of the patients 152(80.85%) reported that weight was never taken at the point of admission and during their stay in hospital with 59(31.38%) reporting the same on dietary assessment. However, almost half of the respondents 84(44.68) reported that dietary assessment was sometimes carried out. Only 3.19% of the respondents received feedback on their nutritional status with 20% reporting to have never received feedback. More than 50% reported that the following was either sometimes or never done at all; no privacy, follow-ups, adequate explanations about procedures/nutrition interventions and delayed responses to their concerns. It was also reported that the nutritionists and other health care providers did not introduce themselves on first-time contact (61.17%). However, more than 40% reported that nutrition counseling sessions were always conducted in a simple manner.

**Table 4. 4: Experiences and challenges by patients on nutrition care services**

	<b>1-Never n (%)</b>	<b>2- Sometimes n (%)</b>	<b>3- Usually n (%)</b>	<b>4- Always n (%)</b>	<b>Total n (%)</b>
Take your weight	152(80.85)	31(16.49)	5(2.66)	0(0)	188(100)
Dietary assessment	59(31.38)	84(44.68)	43(22.87)	2(1.06)	188(100)
Nutritional status feedback	37(19.68)	65(34.57)	80(42.55)	6(3.19)	188(100)
Explanation on any Procedure	99(52.66)	57(30.32)	16(8.51)	16(8.51)	188(100)
Respond quickly to concerns on nutrition	89(47.34)	44(23.4)	22(11.7)	33(17.55)	188(100)
Respond quickly to concerns on food service	87(46.28)	42(22.34)	15(7.98)	44(23.40)	188(100)
Privacy during nutrition Counseling	61(32.45)	54(28.72)	9(4.79)	64(34.04)	188(100)
Counselling session is a conducted in a simpler manner	6(3.19)	30(15.96)	76(40.43)	76(40.43)	188(100)
Does follow up	86(45.74)	50(26.6)	14(7.45)	38(20.21)	188(100)
Nutritionists introduce themselves the first time	76(40.43)	39(20.74)	31(16.49)	42(22.34)	188(100)

## 4.2 Nutrition care quality: Healthcare staff

The following presents perceptions of healthcare workers on nutrition care quality

### 4.2.1 Protocols and Guidelines

Nutritionists in the medical, surgical wards and the chief nutritionist n=5 (100%) including the chief nutritionist reported that they used nutrition protocols and guidelines. Some of these guidelines and protocols used included nutrition care process guidelines, supplementation, and prevention.

*“...We follow protocols such as the iron supplementation protocol provided by the Ministry of Health and other prevention guidelines.”*

However, four out of the five nutritionists interviewed reported that no treatment protocols or guidelines were followed despite being available.

*“... We have guidelines in place such as the IMAM and Kenya National Clinical Nutrition and Dietetics Reference Manual for use in treatment and management of the patient’s condition but we do not use these guidelines and protocols.*

*“... translating these standard treatment guidelines and protocols into practical nutrition advice is difficult.”*

*“...No standard treatment protocols are used in nutrition as we treat and manage patients based on our previously gained knowledge.”*

*“...we find most of these guidelines and protocols outdated.”*

## **4.2.2 Health workforce and support system**

### **4.2.2.1 Knowledge of nutrition staff**

All nutritionists in the wards including the chief nutritionist had some knowledge on nutrition care. However, one respondent felt that sometimes a patient should not be allowed to make decisions about his/her general nutrition care while one felt that a patient should not be allowed completely to make decisions about his/her general nutrition care. The other three felt that the patients should make their own decisions. Two felt that patients should be forced to eat while three respondents felt that patients should not be forced to eat. Three respondents said malnutrition is common among patients with longer length of stay (Table 4.5). This concurs with results obtained from the nutritional assessment of patients in comparison with their length of stay in the hospital.

**Table 4. 5: Knowledge of Nutrition Staff**

<b>Variable</b>	<b>Frequency and (percent %)</b>		
	Yes	No	Sometimes
<b>Knowledge of nutrition staff</b>			
The patient should not be allowed to make decisions about his/ her general nutrition care	1 (20%)	3 (60%)	1 (20%)
Malnutrition is common among patients with long hospital stays	1 (60%)	3 (20%)	1 (20%)
A patient should not be forced to eat	3 (60%)	2 (40%)	

### **4.2.2.2 Attitude of nutrition staff**

Most respondents (n=5) had a positive attitude towards food service and nutrition care with the majority,( three out of five )strongly disagreed that routine nutrition care should be carried out with consultation from a doctor (Table 4.6). On the other hand, most of the nutritionists disagreed with the idea that nutrition support and multi-disciplinary teams were not needed in complicated nutrition cases. The majority of the respondents, three out of five disagreed that health workers should not disclose to patients their medical condition. However, some felt there should be a disclosure of the patient's condition.

A higher number of the respondents (3) felt that there should be less focus on nutrition when death becomes imminent while some (2) felt the focus on nutrition care should be adapted.

**Table 4. 6: Attitude of Nutrition Staff (n=5)**

Variable	Strongly disagree	Disagree	Slightly disagree	Slightly Agree	Agree	Strongly Agree	Total
<b>Attitude of nutrition staff</b>							
Patient nutrition needs	0	0	0	0	2	3	5
Permission for routine care	3	1	0	1	0	0	5
Duration of care	0	0	0	0	3	2	5
Disclosure of patient condition	0	3	0	1	1	0	5
Specialized nutrition care	4	1	0	0	0	0	5
Nutrition care focus	3	0	0	0	2	0	5
Stop care for dying patient	3	2	0	0	0	0	5
Nutritionists play a key role in patient recovery	0	0	0	0	3	2	5
Medical care should not replace nutrition care	1	0	0	0	1	3	5
Not like to care for a critically ill Patient	4	1	0	0	0	0	5
Proper nutrition care for good quality of life	0	0	0	0	2	3	5
Nutrition support teams are never necessary for complicated nutrition cases	3	1	0	0	0	1	5
Multi-disciplinary teams are never necessary for complicated nutrition cases	4	1	0	0	0	0	5
Nutritionists play important role in patient diagnosis	0	0	0	0	4	1	5
Nutrition guidelines in nutrition Management	0	0	0	0	3	2	5
IEC materials in provision of optimal nutrition care	0	0	0	0	3	2	5
Individualization of meals	0	0	0	1	4	0	5
Nutritionists be present during food service	0	0	0	0	3	2	5
Participation in other activities	0	0	0	0	2	3	5
Benefits in implementing the nutrition care process	0	0	0	0	2	3	5
NCP, a good communication tool	0	0	0	0	2	3	5
NCP improves patient nutrition Care	0	0	0	0	4	1	5
NCP encourages critical thinking	0	0	0	0	3	2	5
NCP facilitates more patient involvement in the care process	0	0	0	0	2	3	5

### **4.2.2.3 Experience of nutrition staff**

All respondents n=5 interviewed had been in post for at least one year. Generally, all respondents had experience in nutrition care from managing patients with simple nutrition-related conditions to those who require specialized nutrition care such as critically ill patients. They also had experience using the nutrition care process for the management of nutrition cases.

### **4.2.2.4 Staffing and staff evaluation**

#### **Staff evaluation and Instrument for staff evaluation**

Formal staff evaluation and appraisal were conducted on a quarterly and yearly basis respectively as reported by all nutritionists including the nutritionist in the kitchen and the chief cateress. All said a specific instrument for staff evaluation was used.

*“...Staff appraisal is conducted yearly and this is a great motivator as sometimes we get awards depending on our performance.”*

*“...Staff evaluation and appraisals are done on a quarterly and yearly basis.” “...A specific instrument is used when staff are evaluated.”*

### **4.2.2.5 Staff collaboration and coordination**

#### **i. Inter-consultation on nutritional care**

All the respondents n=5(100%) reported that they rarely consulted nurses or doctors and would only consult them when enteral or parenteral fixing needed to be done, in emergencies or when the patient's condition was deteriorating. They all reported nutritionists and nutrition interns were the only ones involved in the nutrition care of patients.

*“...I only contact the nurse when enteral or parenteral fixing is needed.”*

*“...I rarely consult a nurse or a doctor only in emergencies. Most doctors do not pay attention to nutritionists since the nutrition profession is undermined in our hospitals.”*

*“... Those involved in the nutrition care of patients are the nutritionists and nutrition interns. Doctors and nurses are not involved as they have insufficient knowledge in nutrition.”*

Despite having a programme where other medical professionals consulted nutritionists, these consultations were rarely done as reported by all respondents. It was reported that these consultations were done if the doctors or nurses wanted general information on nutrition or for personal gain.

*“...Doctors rarely consult nutritionists except on rare occasions where they want general nutrition information.”*

*“...you would expect doctors to consult us in nutrition management of specific conditions or when a situation requires a multi-disciplinary approach but this has never been the case.”*

## **ii. Team visits to patients**

Almost all respondents, 4 out of 5 said they did not participate in the clinical visits/ all ward rounds with other health professionals except for one respondent who joined the doctors in the ward rounds on rare occasions.

*“We have our own scheduled time to do our own ward rounds.”*

*“Sometimes I join the doctors as they do their ward rounds in the morning but this is on rare occasions.”*

## **iii. Participation in activities outside the Hospital Nutrition Activities**

All respondents n= 5 (100%) reported participating in activities involving professionals outside the nutrition department including medical and nutrition campaigns, health promotions, outreaches, conferences, seminars, workshops, and continuous nutrition education.

*“...Usually, we take part in activities outside the office; Such as team building, medical outreaches and conferences.”*

*“...We organize nutrition education activities in various institutions including schools, clinics...”*

*“...Apart from occasional nutrition campaigns and promotions, we attend workshops organized by various departments within the hospital especially those directly relating to nutrition.”*

#### **iv. Nutritional support team**

All respondents said the hospital has a nutrition support team. However, 4 out of 5 voiced their concern about the diversity of the team when asked about the participants within the team.

*“...Led by the chief nutritionist we have a nutrition support team that consists of only nutritionists, nutrition interns, and volunteers.”*

*“...Yes we have a nutrition support team. However, this team lacks a diverse group of professionals from all the other cadres including the nurses and doctors”*

#### **4.2.2.6 Autonomy in decision making**

The majority of the respondents, four out five reported that there was no autonomy of staff in making their own decisions as decisions on the management of patients especially the critically ill patient were made based on a doctor’s review or recommendation.

*“... For the management of a critically ill patient, we cannot make decisions without the go-ahead of a doctor.”*

*“...Most of the nutrition decisions we make on the management of a patient are majorly based on the recommendation of a doctor.”*

*“...physicians would always want to review orders before implementing treatment related to tube feeding, parenteral nutrition or prescription of nutrition supplements.”*

#### **4.2.2.7 Duty shift system**

There is a duty shift system on weekends and holidays for nutritionists as reported by the chief nutritionist.

*“...Yes. There is a duty shift system on both holidays and weekends. This has allowed coverage of new cases and immediate nutrition attention for patients who require specialized nutrition care.”*

All respondents reported routinely visiting patients but this was done once a day.

### 4.2.3 Nutrition service delivery

#### 4.2.3.1 Nutrition Care Services and Resources

Table 4.7, shows the overall responses of health care staff satisfaction levels on hospital nutrition care. This excluded the kitchen nutritionist and the chief cateress.

The majority of the respondents, 10 out of 13 were satisfied with the cost of nutrition services for patients. However, most of them were dissatisfied with other aspects including hospital administration willingness to address nutrition queries and concerns, user satisfaction evaluation for patients/clients, facilities to ensure the good provision of nutrition services, nutrition assessment tools and equipment for nutrition evaluation, and the number of nutritionists employed as demonstrated in table 4.7

**Table 4. 7: Health care staff satisfaction level on nutrition care**

Variable	Very Dissatisfied	Dissatisfied	Total	Fairly satisfied	Satisfied	Very satisfied	Total
<b>Health Care Staff (n=13) satisfaction with hospital nutrition care</b>							
Hospital administration willingness to address nutrition queries, concerns, worries, or complaints	0	2	10	2	1	0	1
Cost of nutrition services for patients	0	0	0	3	7	3	10
Number of nutritionists employed	4	6	10	3	0	0	0
Evaluation done for user satisfaction (For patients)	1	4	5	6	2	0	2
Facilities to ensure good provision of nutrition services	2	7	9	4	0	0	0
Nutrition assessment tools/equipment for nutrition evaluation	2	5	7	5	1	0	1
Availability of IEC materials (Nutrition aids) used for nutrition education	1	3	4	6	2	1	3
Provision of nutrition supplements	0	10	10	1	2	0	2
Hospital follow-up programme for each Patient	1	9	10	1	2	0	2



#### 4.2.3.2 Perception of other health care staff towards nutrition care services

In table 4.8, all the doctors and nurses interviewed were fairly satisfied with hospital nutrition care services offered by nutritionists. Despite three out of eight being fairly satisfied with the nutritionists' respect towards patients' privacy and confidentiality, the majority, 5 out of the 8 respondents were dissatisfied.

**Table 4. 8: Nurses and doctors' perception on nutrition care services**

Variable	n=8		
	Disatisfied	Fairly satisfied	Satisfied
<b>Hospital nutrition care services</b>			
Nutritionists welcoming patients at first time contact	1	4	3
The way nutritionists speak to patients	0	5	3
The way nutritionists listen to patients worries and concerns	1	3	4
The way nutritionists treat patients as individuals	0	3	5
Nutritionists willingness to respond to patients concerns/ requests	1	3	4
Information provided	1	4	3
Patients teaching/nutrition education on management of the patient's condition	0	2	6
Respect for patients' privacy and confidentiality	5	3	0

#### 4.2.3.3 Nutrition Care Process

All respondents reported that the nutrition care process structure was used in their dietetic practice.

*"...Yes. We use the nutrition care process in our day-to-day practice in the hospital."*

*"...Yes. One of the protocols within the nutrition department is to follow the nutrition care process."*

In another question where the nutritionists were asked if they had a specific form attached to a patient's records, all respondents admitted to having a nutrition care plan sheet. However, the majority, 4 out 5 admitted to not always use the nutrition care plan sheet.

### **a) Nutrition Assessment**

All the nutritionists interviewed reported that patients were subjected to nutrition assessment which included anthropometric, biochemical, clinical, and dietary assessments but this was the case only during hospitalization and was done to those with either nutritional risk or with specific nutrition conditions.

*“...Nutrition assessment is done during a patient’s hospital stay. Rarely are nutrition assessments done at the point of admission.*

*“...Nutrition assessment is done when a patient is already hospitalized and this is not done all the time. This is done for those patients with a nutritional risk or with specific nutrition conditions.*

*“...Nutrition assessment is rarely done since we lack equipment such as the weighing scales within our wards. Most of this equipment is shared among wards and for biochemical tests, we rely on doctors' requests.”*

Table 4.9, shows the overall responses obtained from nutritionists on nutrition care practices and activities. Four out of the five respondents were satisfied with the dietary assessment. However, four of the respondents were dissatisfied with the follow-up of patients upon admission and discharge. 3 respondents felt fairly satisfied with the weight taking of patients. This seems to be in contrast with the earlier results where the same respondents reported a lack of weighing scales indicating that weight taking was limited. Other aspects showed different levels of satisfaction from the respondents as presented in table 4.9.

**Table 4. 9: Likert scale for nutrition care practices and activities carried out by nutritionists**

Variable	Disatisfied	Fairly satisfied	Satisfied
Take weight for patients	1	3	1
Do clinical assessments	0	2	3
Carry out dietary assessments	0	1	4
Give feedback on patients' nutritional Status	2	2	1
Give an explanation on any procedure or Intervention	2	2	1
Provide the correct and viable intervention for a particular diagnosis	1	1	3
Respond quickly to patients concerns on nutrition care	1	4	0
Respond quickly to patients concerns on food service	1	3	1
Ensure patients' privacy during nutrition counseling and assessment	2	2	1
Ensure confidentiality with patients' Information	1	2	2
Ensure that counseling session is conducted in a simple manner	0	3	2
Follow up on a patients' condition on admission	4	0	1
Follow up on a patients' condition during hospitalization	2	1	2
Follow up on a patients' condition after discharge	4	1	0
How often do you as nutritionist introduce yourself on first-time contact with patient	0	3	2

**b) Nutrition Diagnosis**

All the nutritionists n=5 (100%) reported providing a nutrition diagnosis based on a doctor's/nurse's medical diagnosis reported in the patient medical file.

**c) Nutrition Intervention**

Respondents reported to provide their input on nutrition intervention in the patient's medical record. However, this was done in specific cases; where either a patient required special nutrition attention, in case a doctor recommended it, or on a nutrition review or follow up.

#### **d) Nutrition Monitoring and Evaluation**

The nutritionists routinely visited patients in the wards. However, this was done once and in specific cases; upon request by a doctor or on nutrition review or follow up.

#### **e) Discharge and Follow-Up**

All respondents reported to provide instructions to all patients at discharge. In the case of follow-up, some felt dissatisfied with follow-up of patients when they left the facility. This is of great concern as it is noted that most hospitals do not have a proper follow-up programme.

*“...Yes. Instructions are provided to patients at the point of discharge and for some situations, a return date is given.”*

*“...Yes. We provide intervention information for home-based care however, there is no proper follow-up when the patient leaves the facility.”*

#### **4.2.4 Documentation**

All nutrition information was recorded using the nutrition record sheets with no electronic recording reported in the wards. However, the nutrition information recording was only done if there was a review. From the patient records, it was observed and noted that most patient files had no nutrition record sheets and there was inadequate documentation of nutritional status on hospital admission. There was also inadequate and unsystematic documentation of nutritional information during the hospital stay.

*“...We only document when we are reviewing a patient.”*

*“...Documentation is done when we see the patients in the wards but this is not the case sometimes especially when we miss the nutrition care plan sheets from the file.”*

### 4.3 Food service quality: Patients

#### 4.3.1 Patients' satisfaction with hospital food

To determine patient satisfaction with hospital food, the satisfaction levels for the following parameters were assessed: Table 4.10 shows the satisfaction of patients with the different characteristics of food served in the hospital

**Table 4. 10: Patients' satisfaction level with hospital food characteristics**

	n=188 (100%)		
	Dissatisfied	Fairly Satisfied	Satisfied
Type of Food	38(20.21)	65(34.57)	85(45.21)
Amount of Food	34(18.09)	31(16.49)	123(65.43)
Variety of Hospital Food	108(57.44)	60(31.91)	20(10.64)
Taste of Food	47(25)	58(30.85)	83(44.15)
Appearance of food	35(18.62)	60(31.91)	93(49.47)
Time of Food Service	50(26.60)	31(16.49)	107(56.91)
Temperature of Food Served	12(6.38)	33(18.09)	143(76.06)
Overall quality of Food Served	13(6.91)	69(36.70)	106(56.38)
Attitude of Hospital Staff Serving Food	22(11.7)	25(13.30)	141(75)

#### 4.3.2 Frequency of food consumption among the study participants

Patients were asked to report their consumption of certain foods from the different food groups in the past seven days. Among carbohydrates and starches, ugali was the most common food consumed in the past seven days, reported by 96.81% (n=182) of the patients admitted in the ward. Porridge was consumed by more than three-quarters of the patients while arrowroots, sweet potatoes, and green bananas were least consumed with less than 5% reporting this. Under the category of dairy foods and products, whole milk was consumed by the majority of the patients at 84.57% (n=159). In addition, less than 5% reported consuming green leafy vegetables with cabbage being the most preferred vegetable served in the hospital while kales were not provided at all. Majority, 93.62% (n=176) consumed beef as their source of high biological value protein and only 35% consumed eggs. Beans were consumed by the majority of the patients, 89.89% (n=169) as a plant protein. Citrus fruits were the most common fruits consumed by 71.81% (n=135) of the patients (Table 4.11). Foods from different categories seemed to be well represented in the hospital diet except for green leafy vegetables which were rarely served.

**Table 4. 11: Food frequency consumption of patients**

Frequency (7 Days)	Food eaten in the past week		IF, YES							Total
	YES n(%)	NO n(%)	Once a week	Twice a week	Three times a week	Four times a week	Five times a week	Six times a week	Everyday of the week	
<i>Cereals, Carbohydrates and Starches</i>										
Ugali	182 (96.81)	6 (3.19)	0	6	10	8	5	15	138	188
White bread	165 (87.77)	23 (12.23)	1	6	2	10	6	10	130	188
Brown bread	74 (39.36)	114 (60.64)	2	14	13	11	4	3	27	188
White rice	170 (90.43)	18 (9.57)	1	3	3	13	3	17	130	188
Porridge	178 (94.68)	10 (5.32)	0	2	6	13	6	16	133	188
<i>Roots and tubers</i>										
Sweet potatoes	4 (2.13)	184 (97.87)	2	2	0	0	0	0	0	188
<i>Dairy foods and products</i>										
Whole milk	159 (84.57)	29 (15.43)	10	26	32	36	7	12	36	188
Fermented milk	3 (1.60)	185 (98.40)	3	0	0	0	0	0	0	188
Yoghurt	30 (15.96)	158 (84.04)	10	12	5	3	0	0	0	188
<i>Meat, beef, and eggs</i>										
Beef	176 (93.62)	12 (6.38)	40	41	57	20	6	7	5	188
Chicken	4 (2.13)	184 (97.87)	2	1	1	0	0	0	0	188
Eggs	66 (35.11)	122 (64.89)	20	18	13	7	2	2	2	188
<i>Legumes/pulses and nuts</i>										
Dry beans	169 (89.89)	19 (10.11)	0	12	7	22	14	24	90	188
Lentils	23 (12.23)	165 (87.77)	11	5	6	1	0	0	0	188
Green grams	43 (22.87)	145 (77.13)	11	10	13	6	2	0	1	188
<i>Vegetables</i>										
Green leafy vegetables	5 (2.66)	188 (97.34)	0	0	0	0	0	0	0	188
Cabbage	173 (92.02)	15 (7.98)	1	6	8	14	7	12	125	188
Tomatoes	56 (29.79)	132 (70.21)	9	10	7	10	4	11	5	188
<i>Fruits</i>										
Citrus fruits	135 (71.81)	53 (28.19)	19	22	30	23	9	8	24	188
Pawpaw	24 (12.77)	164 (87.23)	7	8	4	3	1	1	0	188
Mangoes	36 (19.15)	152 (80.85)	5	13	11	2	3	0	2	188
Avocado	52 (27.66)	136 (72.34)	13	12	11	12	1	2	1	188
Banana	54 (28.72)	134 (71.28)	3	12	5	11	6	2	1	188
<i>Sugar alternatives and sweets sugar</i>										
Cakes	11 (5.85)	177 (94.15)	2	3	1	3	3	0	0	188

### 4.3.3 Patients' satisfaction with hospital food service

A total of 49.47% of the patients were comfortable with the food service as their plates were never taken when they had not eaten enough. However, 50% reported their food was sometimes taken away from them before they had eaten enough, reflecting a sense of dissatisfaction (Table 4.12).

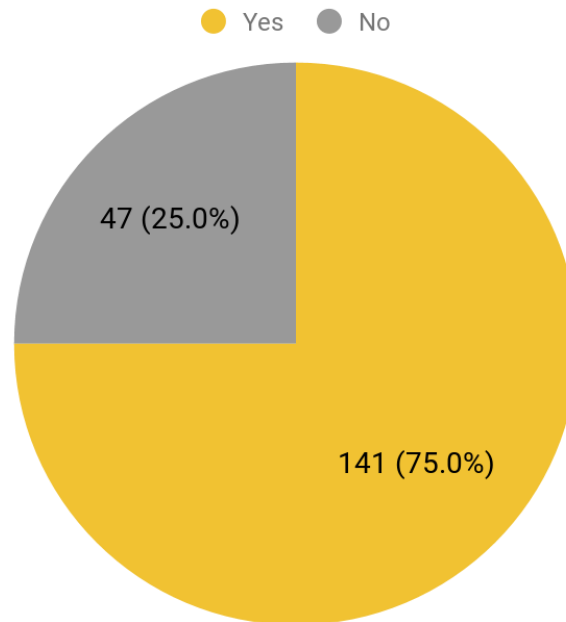
**Table 4. 12: Patients' satisfaction with hospital food service**

<b>Hospital food service characteristics</b>	<b>Yes n(%)</b>	<b>No n(%)</b>	<b>Sometimes n(%)</b>	<b>Total n(%)</b>
Is hospital food taken away before you have eaten enough?	1(0.53)	93(49.47)	94(50)	188(100)
Is hospital food taken away after you have eaten enough?	3(1.60)	92(48.94)	93(49.47)	188(100)
Can you get a drink or snack when you want?	81(43.09)	80(42.55)	27(14.36)	188(100)
In case you are not at the ward during mealtime(undergoing a test or procedure), is food givento you later	76(40.43)	73(38.83)	39(20.74)	188(100)

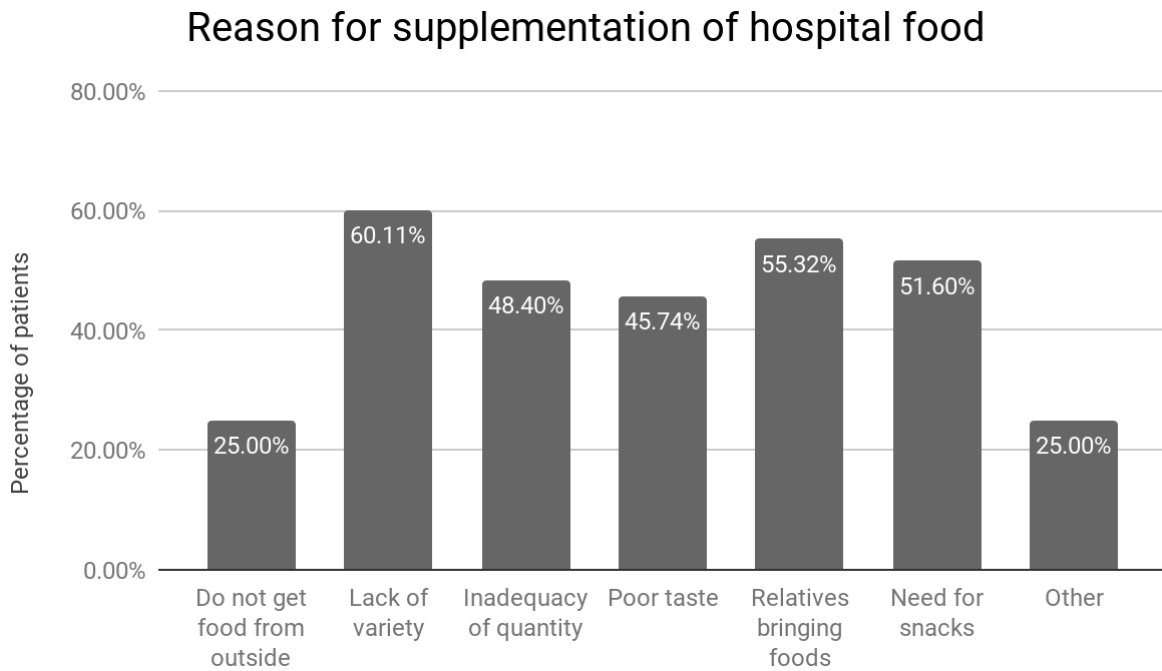
### 4.3.4 Supplementation of hospital food with externally sourced food

To determine patients' perception of food service quality, patients were asked if they got food from outside and were asked to give the reasons why. From figure 4.2, the majority of the respondents 140(74.47%) externally sourced food to supplement their diet in the hospital. The three major reasons for supplementation of hospital food were; lack of variety (60.11%), prefer food from outside the hospital (55.32%) and 51.60% felt the need for snacks (Figure 4.2).

## Hospital Food Supplementation



**Figure 4. 1: Hospital Food Supplementation**



**Figure 4. 2: Reasons for Supplementation of Hospital Food**



## 4.4 Food service quality: Healthcare staff

### 4.4.1 Perception of healthcare staff on hospital food and food service

The perception of health workers' satisfaction with different aspects of food and foodservice was evaluated as shown in table 4.13.

**Table 4. 13: Perception of healthcare staff on hospital food and food service**

n=15			
Variable	Disatisfied	Fairly satisfied	Satisfied
Type of food served	4	3	8
Amount of food	3	3	9
Variety of hospital food	8	3	4
Taste of food served	3	3	9
Appearance of food served	3	6	6
Time of food served	5	1	9
Temperature of food	2	2	11
Overall quality of food	2	5	8
Attitude of hospital staff	1	6	8

### 4.4.2 Distribution of meals in the wards

From the interviews, it was noted that nutritionists do not accompany meal distribution in the ward. However, the kitchen nutritionist and chief cateress oversee the service in the kitchen before distribution to the patients in the wards.

*"...We do not accompany the distribution of meals in the ward."*

*"...Distribution of meals in the ward is overseen by the chief cateress."*

### 4.4.3 Actions supporting diet therapy

#### 4.4.3.1Dietetic kitchen

It was reported that the hospital has a designated special kitchen for the preparation of special diets in the hospital. These special diets are for patients with special nutrition needs such as diabetic patients who are prescribed a low carbohydrate diet, surgical patients who take liquid and soft diets, and burnt patients who need high protein diets.

*“...Yes. There is a special kitchen within the main kitchen where all therapeutic diets are prepared.”*

*“...Yes. We have a designated special kitchen for preparation of special diets in the hospital.”*

#### **4.4.3.2 Routine tasting of diets**

There is a routine tasting of foods prepared. This is done by the nutritionist in charge of the kitchen section and the chief cateress.

*“...There is a routine tasting of food to ensure food prepared is of good quality. This is done by the kitchen nutritionist and the chief cateress.”*

*“...I personally taste foods prepared every single day before it's served to the patients in the wards.”*

#### **4.4.3.3 Recipe and Diet manual**

All respondents n= 7 (100%) said there was neither a diet manual nor a manual for the standardized diets available in the hospital for consultation. They also reported that there were no normal and special diet recipes in the hospital.

*“...We have a list of special diets prepared in our kitchen but we do not have an actual diet manual nor a manual to prepare these diets.”*

*“...We use our recipes that we know based on our knowledge but we do not have normal or special diet recipes in the hospital.”*

#### **4.4.3.4 Information about energy supply**

The hospital follows the 2000kcal recommended by the Ministry of Health when preparing meals for patients. This had been particularly tested for meals served per each sitting in the hospital. However, five out of seven of the respondents said it is impossible to obtain information on energy supplied by each type of diet.

#### **4.4.3.5 Prescribed diets and nutritional supplements**

All respondents n= 7 (100%) reported that both prescribed diets and industrialized nutrition supplements were provided in the hospital and requests for these supplements were done. Despite a high number of requests, they felt dissatisfied that supplies of these supplements to the hospital were always delayed, sometimes completely not available, and were very costly.

#### **4.4.3.6 Request mechanism for changes to diet**

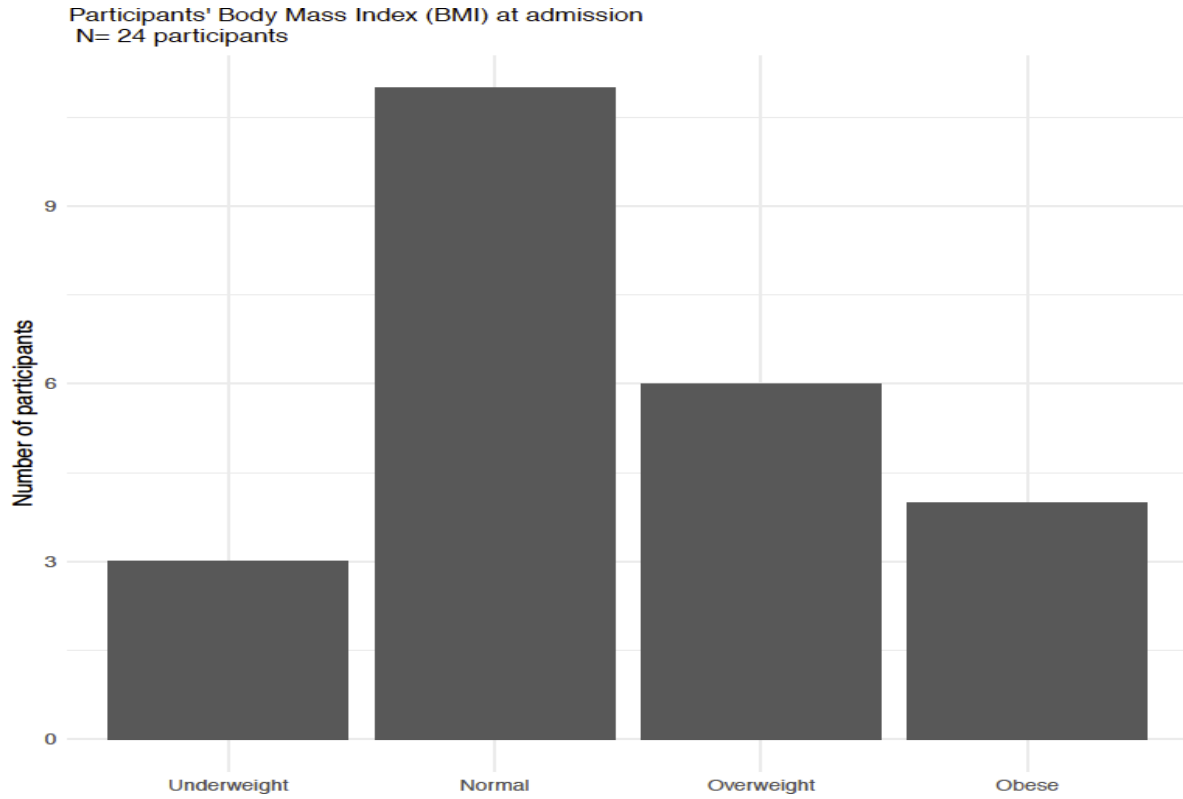
Despite requests for diet modification by patients, all respondents n= 7 (100%) reported only verbal requests were done if patients required changes to their diet. This means, there is no formal system of patients placing a request for a change in their diets.

#### **4.5 Determination of nutrition status of adult patient and length of stay**

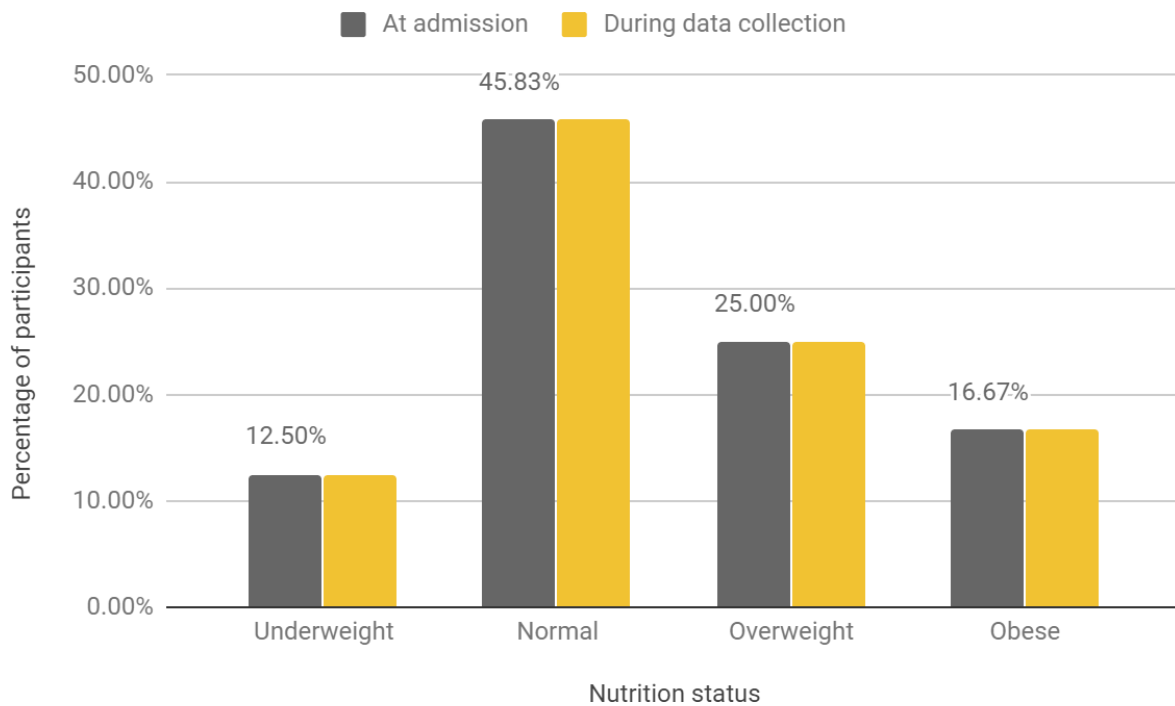
The nutrition status of study participants was determined using body mass index and mid-upper arm circumference.

##### **4.5.1 Nutrition status on admission as measured using BMI**

As part of assessing the nutrition care practices among patients admitted in the hospital, the study sought to find out if nutrition status assessment at the point of admission was routinely done. Out of 188 respondents, only 24 participants (12.77%) had their weight taken at admission and documented. In Figure 4.3, the majority of the patients whose weights were taken on admission were normal (45.8%). The BMI of the 24 participants computed during data collection did not change. (Figure 4.4)



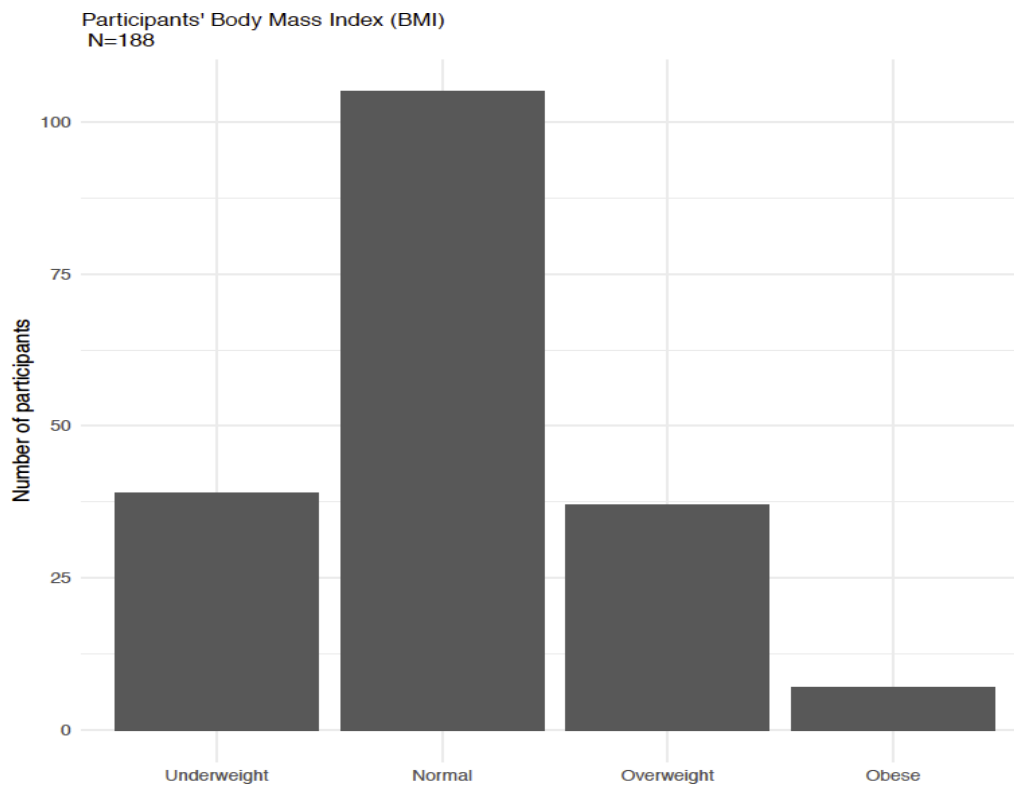
**Figure 4. 3: Participants Body Mass Index at Admission (n= 24)**



**Figure 4. 4: Comparisons of BMI (n= 24) at admission and during data collection**

#### 4.5.2 Nutrition status of the patients during data collection using BMI

A total of 105 participants (55.85%) had normal weight with 39 (20.74%), 37 (19.68%), and 7 (3.72%) were underweight, overweight, and obese respectively (Figure 4.5 and Table 4.14). The mean BMI was  $22.04 \pm 3.88$  which depicts the majority of the patients had a normal nutritional status (18.5-24.9).

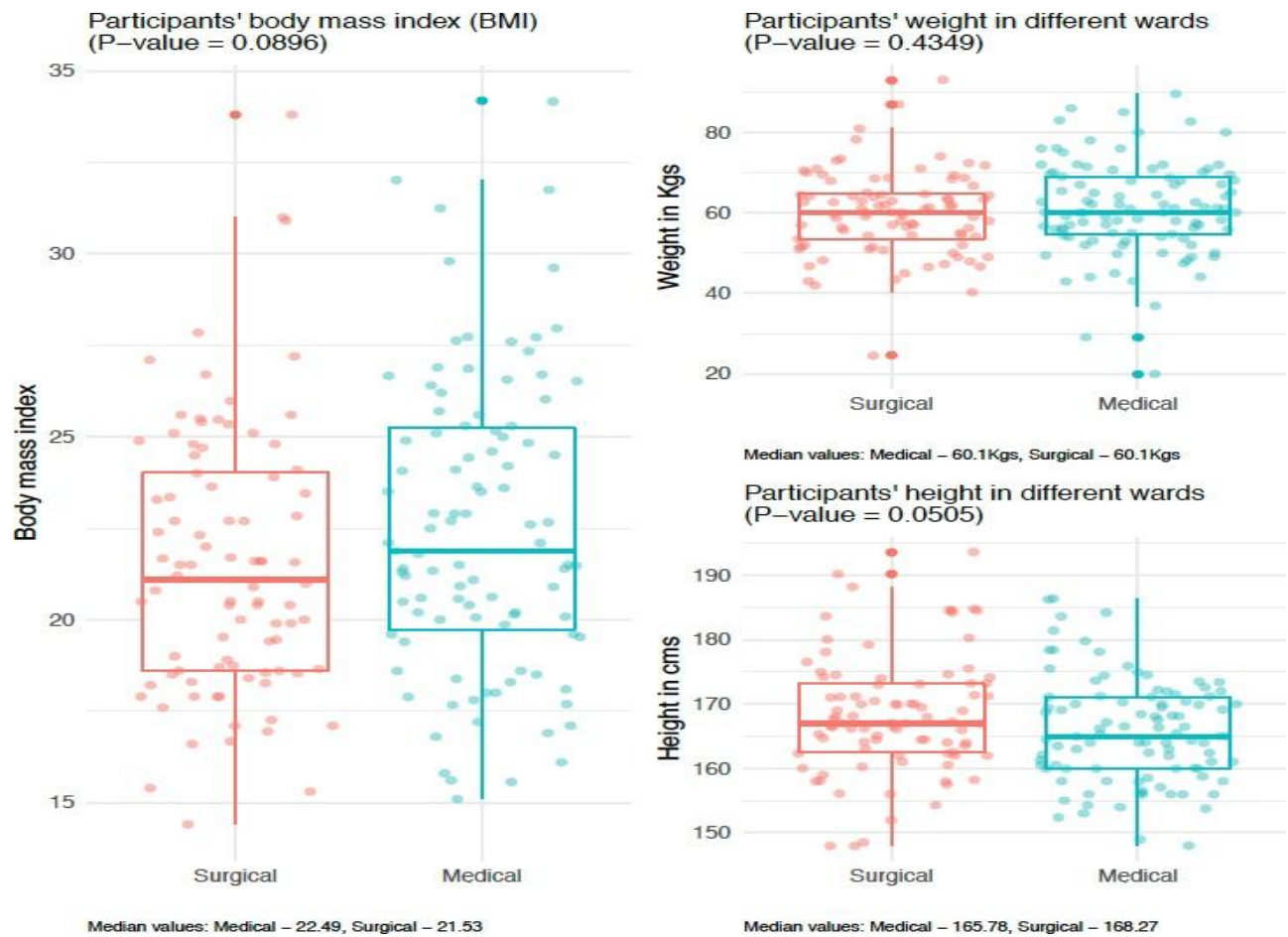


**Figure 4. 5: Mass Index classification of the 188 participants during data collection**

**Table 4. 14: BMI determination during data collection (n=188)**

BMI cut off points (kg/M2)	Total (n=188) n (%)	Medical (n=99)		Surgical (n=89)	
		Male n (%)	Female n (%)	Male n (%)	Female n (%)
<18.5 (Underweight)	39 (20.74%)	13 (13.13)	7(7.07)	15 (16.85)	4(4.49)
18.5-24.9 (Normal)	105 (55.5)	29(29.29)	22(22.22)	36 (40.45)	18 (29.29)
24.9-29.9 (Overweight)	37 (19.68%)	6(6.06)	18(18.18)	3(3.37)	10(11.24)
>30 (Obese)	7 (3.72%)	1(1.01)	3(3.03)	0 (0)	3(3.37)

The BMI median values for patients in medical and surgical wards were 22.49 and 21.53 respectively with no significant difference (P= 0.0896) (Figure 4.6).



**Figure 4. 6: Participants Body Mass Index in Medical and Surgical wards (n= 188)**

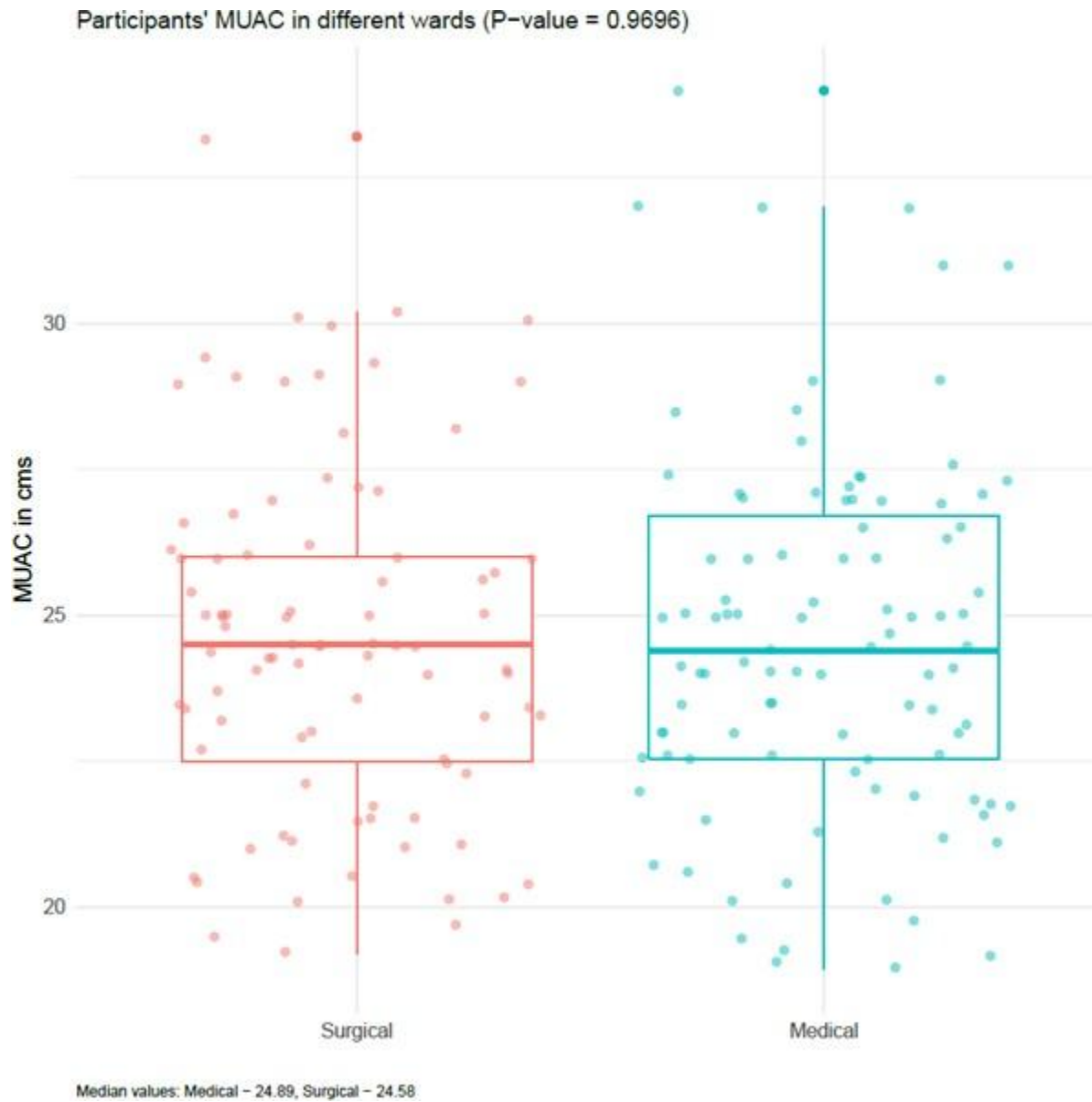
**Key:**

*Red-Surgical and Blue-Medical*

*N.B: Independent t-test used. Level of significance p-value 0.05*

**4.5.3 Nutrition status of the patients as measured using MUAC**

The mean MUAC of the patients was 24.56± 3.04. The MUAC median values for patients in medical and surgical wards were 24.89 and 24.58 respectively with no significant difference (P= 0.9696) (Figure 4.7).



**Figure 4. 7: Participants MUAC in Medical and Surgical wards (n= 188)**

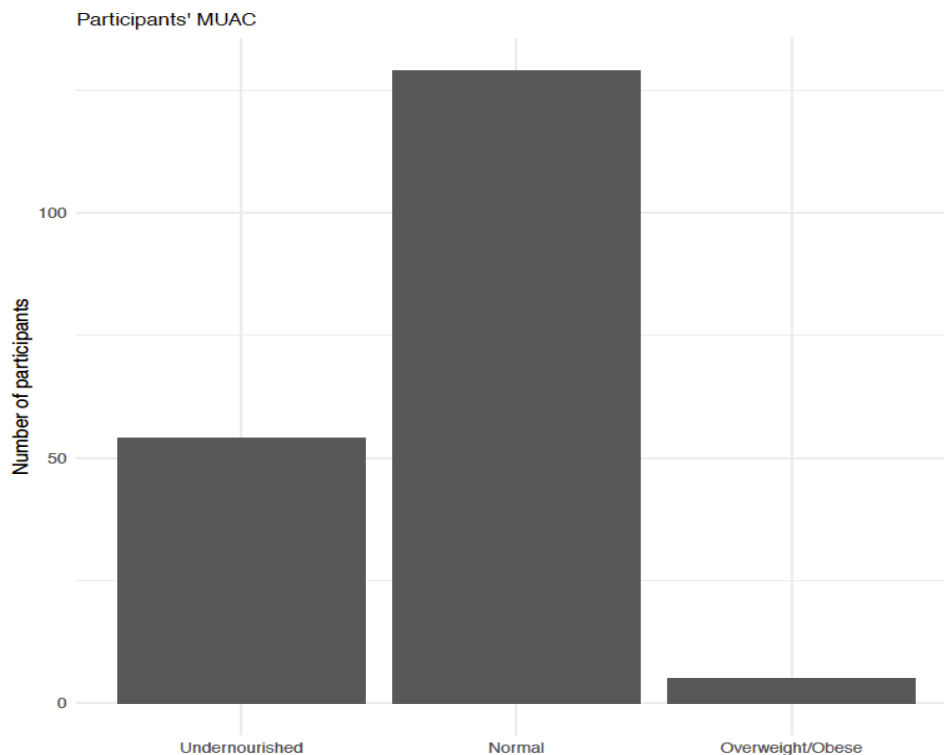
*N.B: Independent t-test used. Level of significance p-value 0.05*

Based on the MUAC of the patients, 129 (68.62%) of the participants had normal nutrition status while only 54(28.72%) were underweight and 5 (2.66%) obese (Table 4.15 and Figure 4.8).

**Table 4. 15: Nutrition status of patients as measured using MUAC during data collection (n=188)**

MUAC	During data Collection n(%)	Nutrition status
< 23 cm	54 (28.72)	Undernutrition
23 ≤ to 32 cm	129 (68.62)	Normal
> 32 cm	5 (2.66)	Overweight/Obese

Classification is based on cut-offs (Kimani & Sharif, 2009; Chakraborty, Bose & Bisai, 2009).



**Figure 4. 8: MUAC classification of the 188 participants**

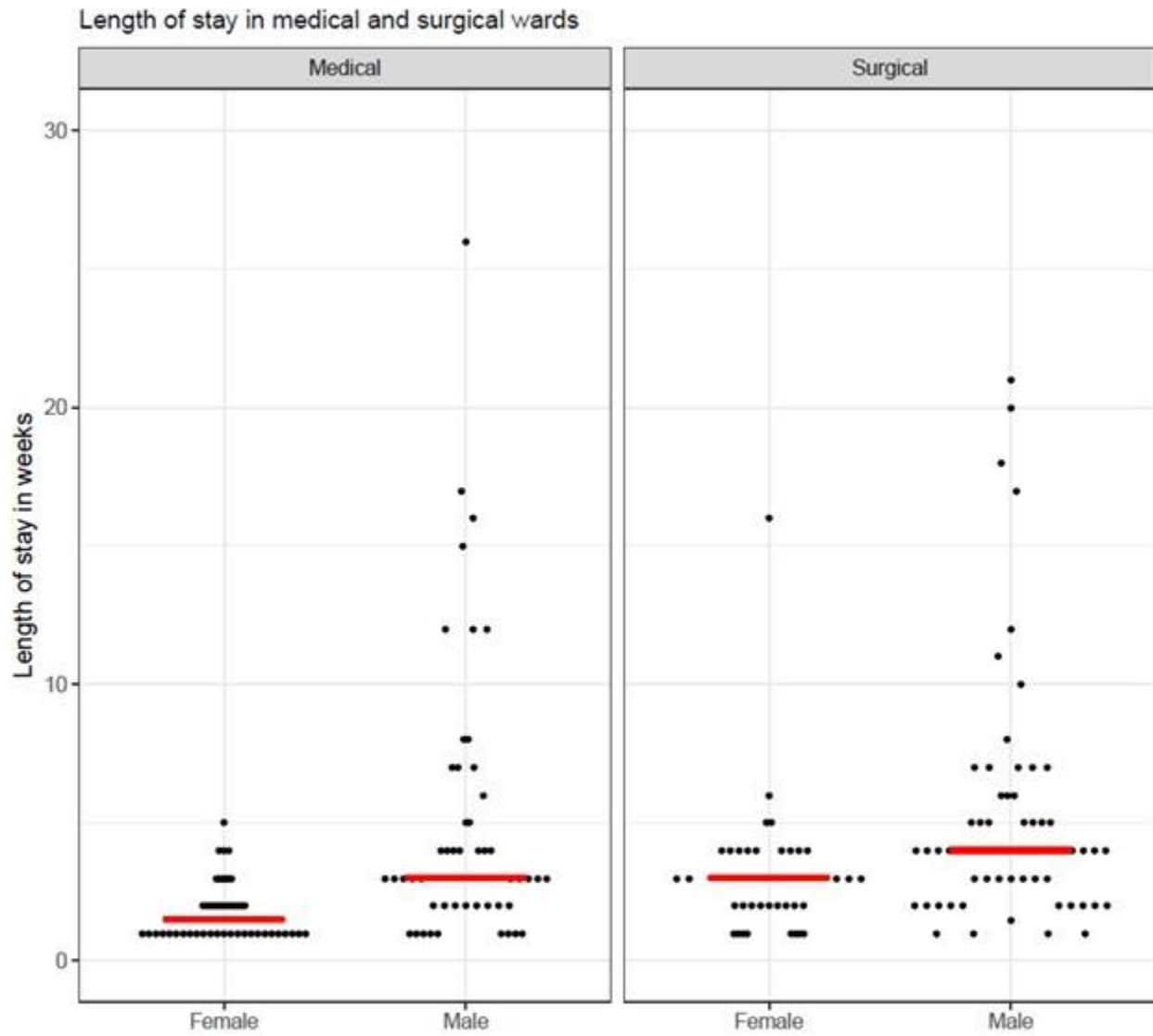


#### 4.5.4 Length of stay

The mean length of stay (LOS) at the ward at the time of the study was 4.48 (SD 8.86) weeks with one participant having stayed for 112 weeks. As shown in Table 4.16 and Figure 4.9, the mean length of stay for male respondents was significantly higher than female participants (p-value = 0.0027). The mean length of stay at the surgical ward was longer compared to the medical ward, however, this was not significant (p-value = 0.0817).

**Table 4. 16: Patients’ mean length of stay at the wards in weeks**

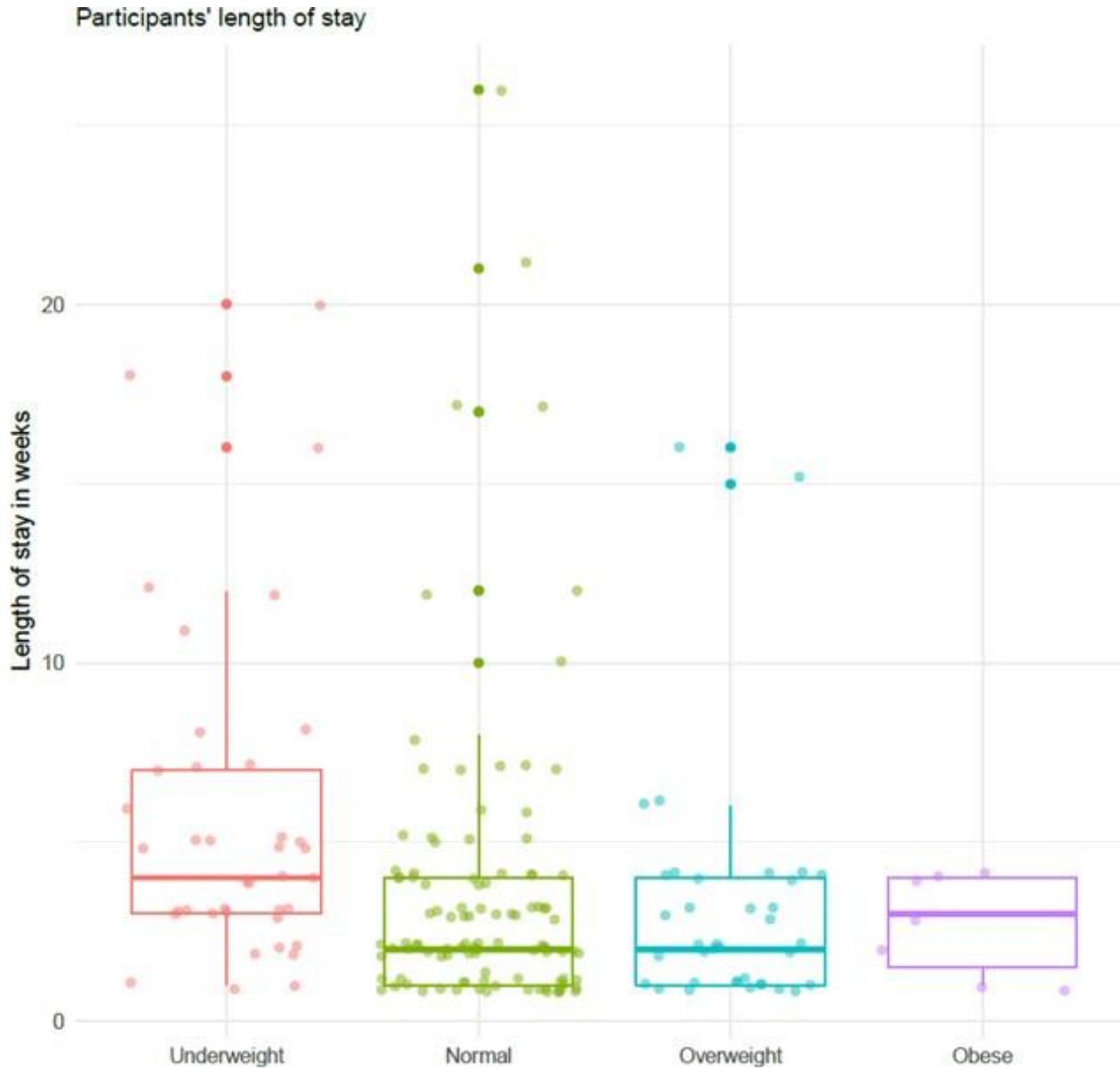
	Mean	SD
All patients	4.48	8.86
Male (n=103)	6.23	11.58
Female (n=85)	2.36	1.96
Surgical ward (n=99)	5.67	12.11
Medical ward (n=89)	3.41	3.98



\*One male participant in surgical ward had stayed for 112 weeks (not presented in the graph)

**Figure 4. 9: Length of stay of patients in medical and surgical wards**

In Figure 4.10, participants that were classified as underweight at the time of the interview had stayed longer in the hospital (median = 4 weeks). The LOS for participants with normal nutritional status varied a lot but with the majority admitted for fewer days compared to other groups.



**Figure 4. 10: Patients length of stay according to BMI classification**

#### 4.6 Association between nutrition care, food service quality and nutrition status

Chi-square test was used to test for any associations between nutrition care, food service quality and nutrition status of admitted adult patients at Nakuru Level Five hospital. There was a significant association between the length patients stayed in hospital, the variety of hospital food, the general perception of hospital food service and nutrition care quality, and nutrition status. Out of the patients who were very dissatisfied with the variety of hospital food, 45.45% of them were underweight and the highest record compared to other categories (normal weight: 36.36%, and overweight: 18.18%). According to the chi-square association test, patients who were very dissatisfied with the variety of hospital food were likely to be underweight. This was a significant association with a p-value=0.013. However, there was no significant association between the other variables and nutrition status. (Table 4.17)

**Table 4. 17: Association of food service and nutrition care variable with nutrition status**

S/NO	VARIABLES	P-VALUE
1.	<b>FOOD SERVICE QUALITY</b>	
	Dietary Diversity Score	0.272
	Type of food served	0.115
	Amount of food	0.363
	Variety of hospital food	0.013
	Overall quality of food served in the hospital	0.237
	Supplementation of Hospital Food	0.762
2.	<b>NUTRITION CARE QUALITY</b>	
	Weight taking	0.448
	Explanation about nutrition intervention	0.109
	Nutrition education on management of patient's condition	0.629
	Counseling session is conducted in a simple manner	0.628
	Follow-up	0.452
	Alleviation of patient's anxiety and stress	0.732
3.	<b>GENERAL PERCEPTION</b>	
	General perception of Food service and Nutrition care Quality	0.002
4.	<b>LENGTH OF HOSPITAL STAY</b>	
	Patients length of Hospital stay	0.0006

## CHAPTER FIVE: DISCUSSION

### 5.1 Nutrition care quality: Patients

#### 5.1.1 Nutrition care practices and services

Nutrition care is an essential component to ensuring improved quality of life of patients admitted in hospitals (Tappenden et al., 2013; Amarantos, Martinez & Dwyer, 2001). Nutrition services are also an important element of all phases of the continuum of health care services to patients. Nutrition and food services can play a major role in preserving the quality of life by improving the health status of individuals, reducing the rate and length of institutionalization, and lowering health care costs (Tyrovolas et al., 2011, Posner & Krachenfels, 1987).

Overall, 53.2% of respondents were satisfied with nutrition care services, which is comparable to other studies that looked at satisfaction with general health care services. The level of satisfaction of health care services in a study done in Ethiopia was reported at 49.2% (Sharew et al., 2017), which is slightly lower than other studies in the Philippines (57.8%) (Villarruz-Sulit, Dans & Javelosa, 2009), Turkey (54.8%) (Erci et al., 2010), India (73%) (Sharma, Kasar & Sharma, 2014), Iran (82.8%) (Akhtari-Zavare et al., 2010), Malaysia (82.7%) (Eyasu et al., 2016) and Ethiopia (56.9%–81.8%) (Negash, Negussie & Demissie, 2014).

The majority of the respondents in this study expressed dissatisfaction with nutrition information provided (74.47%), nutrition education on management of patients' condition (71.81%), and respect for patients' privacy and confidentiality (69.15%). Almost 50% of the study participants were also dissatisfied with the nutritionists' response in dealing with patients' anxiety and stress. A study conducted in Kyrgyzstan (Shayahmetov et al., 2016), showed similar results where 57.4% of the respondents were dissatisfied with how privacy and confidentiality were handled. However, 40% of the patients were satisfied with the information and nutrition education/teaching provided to them. In the same study, half of the participants (50%) were satisfied with the way nutritionists spoke to them which was similar to our study that recorded satisfaction, with over 50% of the respondents being satisfied with how nutritionists welcomed them, spoke to them, listened and their willingness to respond to their concerns.

### **5.1.2 Experiences and challenges on nutrition care services**

Nutritional status assessment of critically ill patients is performed to classify nutritional status, identify nutritional risk, and serve as a baseline for monitoring nutrition support adequacy (Prins, 2010). In this study, patients' satisfaction in terms of their experiences and challenges in the process of nutritionists delivering nutrition services was investigated. Most of the respondents were generally dissatisfied with hospital nutrition care services delivered by nutritionists. The majority of the patients (80.85%) in this study reported that weight was never taken at the point of admission and during their stay in the hospital, with 31.38% reporting the same on dietary assessment. This is despite the fact that screening and assessment of patients on admission to the hospital is viewed as crucial and highly recommended (Lochs et al., 2006).

It was reported that only 3.19% of the respondents received feedback on their nutritional status while the majority did not. It was also reported that the nutritionists and other health care providers did not introduce themselves on first-time contact with almost 50% reporting this. This could have amounted to patient neglect which refers to behaviors that lead patients and observers to believe that staff have uncaring attitudes (Reader, & Gillespie, 2013). When patients are involved in their care, they are better able to manage complex chronic conditions by understanding and adhering to their plan of care. Healthcare providers can enable patients to participate fully using patient-centered communication (Naughton, 2018). It is therefore essential for healthcare professionals to understand each patient's preferences as this greatly facilitates the communicative process and improves patient satisfaction (Lang, 2012).

In this study, more than 50% of the respondents also reported that there was no proper privacy, follow-ups on their condition and recovery process, adequate explanations about procedures/nutrition interventions, and responses were delayed on their concerns on nutrition care and food service. The behavior of hospital staff and the hospital environment greatly influence a patients' privacy. Lack of privacy threatens patient's dignity (Baillie, 2009). In a cross-sectional study conducted in two regional hospitals in Kyrgyzstan among 500 patients on their dissatisfaction with medical services, more than 50% were dissatisfied with the accessibility of doctors' explanation and patient's privacy and confidentiality not secured (Shayahmetov et al., 2016).

## **5.2 Nutrition care quality: Healthcare staff**

### **5.2.1 Protocols and guidelines**

Many national, international and professional guidelines exist that include medical and nutrition as an integral part of patient care. However, continued effort is needed to ensure guidelines are updated to reflect the evidence base, to integrate good nutritional care into guidelines for specific disease management, and to ensure that these guidelines are recognized and established as a credible and essential basis for good patient care. From the findings of this study, all respondents reported that nutrition protocols and guidelines for the nutrition care process, supplementation, and prevention were followed. Translation of these guidelines into practical nutrition advice for healthcare providers was also a problem yet it is needed to achieve both improved patient outcomes and to ensure the appropriate use of resources. In addition, standard treatment guidelines for nutrition and disease management are incorporated into systems as a way to help practitioners provide the best evidence-based care to their patients and decisions and criteria regarding diagnosis, management, and treatment (Knebel & Greiner, 2003). It is therefore essential for practicing nutritionists to use standard treatment guidelines as they aim to improve the quality of healthcare and people's chances of getting well (Gopalakrishnan, Udayshankar & Rama, 2014).

### **5.2.2 Health workforce and support system**

#### **5.2.2.1 Knowledge of nutrition staff**

In this current study, several knowledge questions were asked. All respondents had some knowledge on nutrition care. However, the question on patient decision making about their general nutrition care had some disparities in the answers with one respondent feeling that sometimes a patient should not be allowed to make decisions about his/her general nutrition care while one felt that a patient should not be allowed completely to make decisions about his/her general nutrition care. This was also evident in a study conducted in two selected secondary hospitals in Kyrgyzstan where above 70% of the patients interviewed felt dissatisfied with patients' participation in treatment decision making (Shayahmetov et al., 2016). The need for patient engagement where the patient is encouraged to take an active role as a key player in protecting their health, choosing appropriate treatments for episodes of ill health, and managing chronic disease is often ignored.

The most common source of patient dissatisfaction is not being properly informed about their condition and the options for treating it. Most patients want more information than they are routinely given by health professionals, and many would like a greater share in the process of making decisions about how they will be treated (Grol et al., 2000). Shared decision-making is “a process in which patients are involved as active partners with the clinician in clarifying acceptable medical options and in choosing a preferred course of clinical care” (Sheridan et al., 2004).

In another question on force-feeding, two out of five felt that patients should be forced to eat. A study highlighted a case of prisons in Chile's southern regions where a decision was made to feed hungry thirty-two Mapuche prisoners intravenously. This led to a confrontation between prisoners and the authorities seeking to feed them against their expressed wishes, (Passmore, 2014). A declaration was later made by the World Medical Association's Declaration of Malta stating that forcible feeding is never ethically acceptable (World Medical Association, 2014)

Three out of five respondents in this study said malnutrition was common among patients with a longer length of stay. This was in concurrence with patient results which showed that underweight patients had stayed longer in the hospital. The results revealed that the majority of the nutritionists had knowledge as this is evident in several studies where malnutrition is linked to longer hospital stays (Barker, Gout & Crowe, 2011; Luma et al. 2017, Badosa et al., 2017; Maia et al., 2018)

#### **5.2.2.2 Attitude of nutrition staff**

In the present study, all respondents n=5 (100%) had a positive attitude towards foodservice and nutrition care with the majority, three out of five strongly disagreeing that routine nutrition care should be carried out with consultation from a doctor. On the other hand, most of the nutritionists disagreed with the idea that nutrition support and multi-disciplinary teams were not needed in complicated nutrition cases. A report by Kopelman & Lennard-Jones, (2002) emphasized the need for a multidisciplinary approach, involving all the healthcare professionals involved in nutritional care. This demonstrates a need for collaboration among health practitioners when delivering health and nutrition services.



There was disparity on the question related to whether patients should be given honest answers about their condition as the majority of the respondents felt honest answers should be given. A study conducted in eight Iranian hospitals (Mosadeghrad, 2014) that focused on identifying factors that influence healthcare quality in the Iranian context revealed that patient involvement and cooperation between the health care provider and the patient was needed. The findings also revealed the factors which help improve the physician-patient relationship were providing more information about the disease and the process of treatment and good interpersonal relations. Doctors considered patient trust a key factor in achieving the desired outcomes.

There was a difference in attitude when some of the respondents felt that there should be less focus on nutrition when death becomes imminent while some felt focus on nutrition support care should be adapted. Nutrition should be positioned as one of the cornerstones of essential health packages and all health services must integrate a stronger focus on ensuring optimum nutrition at each stage of a person's life (World Health Organization, 2013). It is estimated that the right investment in nutrition could save 3.7 million lives by 2025 World Bank (Shekar et al., 2016).

Considerable data is indicating that it is not beneficial to provide nutrition support for patients with an irreversible or terminal illness (Hui, Dev & Bruera, (2015) and lack of evidence to support that artificial nutrition and hydration improve outcomes in patients in the last days of life. (Fine, 2006). However, nutrition support has been shown to benefit patients by reducing physical deterioration, improving quality of life, and preventing the emotional effect of "starving the patient to death (Fuhrman & Herrmann, 2006).

### **5.2.2.3 Experience of nutrition staff**

From this current study, all respondents interviewed had been in post for at least one year. Generally, all had experience in the provision of nutrition care services. Several studies have directly linked staff experience to patients' satisfaction hence improved patient outcome and quality of care (Choudhry, Fletcher & Soumerai, 2005); Janicijevic et al., 2013).

### **5.2.2.4 Staffing and Staff Evaluation**

Staff evaluation and appraisal play a vital role in the overall success of an organization. An appropriate appraisal system could possibly increase health workers' job satisfaction and empowerment to provide better services to the clients.

In this current study, the respondents reported that formal staff evaluation and appraisal was conducted on a quarterly and yearly basis and a specific instrument for staff evaluation was used. This was also evident in a study conducted in 3 hospitals in Egypt (Youssif, Eid & Safan 2017) where 400 nurses were interviewed. It was reported that there was a significant relationship in staff performance appraisal and job satisfaction. However, despite staff evaluation being conducted in some institutions, not all institutions conduct this. This was reported in a Brazilian study where out of 12 public hospitals and 25 private hospitals, only 4 and 8 carried out staff evaluation respectively (Diez-Garcia et al., 2012).

#### **5.2.2.5 Staff collaboration and coordination**

##### **i. Interconsultation on nutrition care**

Collaboration between the nutrition and medical professions is essential. The leadership provided by expert collaborations is paramount for increasing the profile of nutrition science as a highly valued, specialist field of health. There is a need to advocate for dietitians, and the role they can play in patient care, as well as to increase dietitians' awareness of the challenges doctors face in providing nutrition advice to patients (Adamski et al., 2018). It was vivid that there was a disconnect between nutritionists and other health care professionals in this current study as the majority of the respondents did not collaborate in the nutrition care with other health professionals as nutritionists and nutrition interns were the only ones involved. Inter-consultation among nutritionists and other health care staff was rare as all the respondents reported to only consult doctors and nurses on specific situations. A comparative study (Diez-Garcia et al., 2012) gauging actions related to food and nutritional care quality in public and private hospitals in Brazil showed actions related to the insertion of the dietitian into the health care team were more frequent in public hospitals. This is in contrast to this current study.

Medical professionals acknowledge nutrition plays an important role in health and agree that providing nutrition advice is part of their role (Ball, Hughes & Leveritt, 2010; Kolasa & Rickett, 2010; Mitchell, MacDonald-Wicks & Capra, 2011; Crowley et al., 2015). However, they are not always able to translate this priority into practice and provide sufficiently detailed and sustained nutrition advice that result in meaningful changes (Kahan & Manson 2017). This is because globally, medical curricula have been described as lacking sufficient nutrition education (Daley et al. 2016; Frantz et al. 2016; Cuerda, Schneider, & Van Gossum, 2017; Kahan & Manson 2017; Mogre et al. 2018).

This was clear in this current study when some of the respondents reported that most of the doctors and nurses were not involved in nutrition care because they had insufficient knowledge in nutrition.

*“... Those involved in the nutrition care of patients are the nutritionists and nutrition interns. Doctors and nurses are not involved as they have insufficient knowledge in nutrition.”*

## **ii. Participation in other activities**

From this study, all respondents reported that they participated regularly in other professional activities such as medical and nutrition campaigns, health promotions, outreaches, conferences, seminars, training, and workshops. A systematic review of trials on nutrition training for health care staff noted that this had some positive effects on the patient outcome and the learner in terms of knowledge, nutrition practice, and attitude (Marples, Baldwin & Weekes, 2017). Similarly, integration of the health care team into nutritional care activities was reported in a study conducted in Brazil (Diez-Garcia et al., 2012) where over 70% of the Hospital Food Nutrition Service of 37 public and private hospitals participated in events held outside the institution, evidencing engagement of the service with nutritional issues.

This is in contrast with a study conducted among 27 health workers in a Tanzanian hospital which revealed there was a lack of motivation for health care workers and workplace training opportunities (Khamis and Njau, 2016). Participation in non-regular activities is key to ensuring staff empowerment, motivation, and satisfaction hence the quality of both food service and nutrition care.

## **iii. Nutritional support team**

The use of an interdisciplinary nutrition support team (NST) has been shown to improve patient safety and outcomes and to have a positive financial impact on health care organizations (National Collaborating Centre for Acute Care, 2006). In this current study, all respondents said the hospital has a nutrition support team, although the team consisted of only nutritionists, nutrition interns, and volunteers, lacking diversity.

*“...Yes we have a nutrition support team. However, this team lacks a diverse group of professionals from all the other cadres including the nurses and doctors”*

A good nutrition support team should consist of a multidisciplinary team (Derenski & Daniel, 2015) which is an important intervention for a patient (Nightingale, 2010) and an effective way of substantially improving the quality of care (Burch, Stewart, & Smith, 2011). In 2010, the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) evaluated the care given to patients receiving parenteral nutrition in Great Britain (Burch, Stewart, & Smith, 2011). The results revealed that the involvement of a nutrition support team substantially improved the quality of care as patients' conditions improved. Similarly, a study conducted in Korea (Park et al., 2017) on impact and outcomes of nutritional support team intervention in patients with gastrointestinal disease in the intensive care unit where forty-four (71.0%) patients received nutritional support in ICU and 18 (29.0%) did not reveal that Nutrition Support Team interventions are beneficial to decrease mortality in the acutely ill patients.

#### **5.2.2.6 Autonomy in decision making**

The majority of the respondents, four out five reported that there was no autonomy of nutrition staff in making their own decisions as decisions on the management of patients especially the critically ill patient were made based on a doctor's review or recommendation. A survey conducted among registered dietitians and medical doctors on perceptions about diets and total parenteral nutrition (TPN) orders for hospitalized patients reported that registered dietitians felt comfortable issuing TPN and diet orders without a physician review and felt autonomy on such issues should be increased (Abed et al., 2016). The results of this study agree with the findings of our study.

#### **5.2.2.7 Duty shift system and ward rounds**

A duty shift system is considered essential and obligatory to ensure the stability of care in hospitals (Ali, Rasheed & Naz, 2018). Hospitals work round the clock, which means they need staff to work in shifts. In this study, a duty shift system on weekends and holidays for nutritionists was reported to be in place to allow coverage of new cases and immediate and quick nutrition attention for patients who required specialized nutrition care. A cross-sectional survey was conducted in 12 hospitals in Malaysia, Mu'taman Jarrar, Sebiany & AbuMadini, (2018) investigated the effect of the hospital nurse shift length and patient-centered care on the perceived quality and safety of nurses in the medical-surgical wards. The results revealed longer working hours with no shifts are directly related to low-quality patient care.

Studies carried out in Europe, the UK and the US reported poor quality nursing care and reduced patient safety when nurses worked shifts of 12 hours or longer (Griffiths et al, 2014; Stimpfel & Aiken, 2013). Similarly, in some studies where duty shift systems were not available, cases of increased fatigue and decreased alertness were reported (Dall’Ora et al, 2016).

Ward rounds form an integral part of medicine and nutrition teaching. In this study, all nutritionists n=5(100%) said they routinely visited patients in the wards once daily and were not necessarily accompanied by other health care teams. A cross-sectional study conducted on a total of 134 trainees at the Aga Khan University Hospital (AKUH), Karachi (Pakistan), reported that, out of the total participants, 113 (84.3%) were of the view that ward rounds should be multidisciplinary to enhance learning and efficiency. In addition, they felt that other professional cadres including nutritionists should be included as part of the ward round team (Tariq et al., 2010). Similarly, in other studies, medical officers were the most likely profession to attend any round with other cadres less likely yet multidisciplinary rounds were the most collaborative (Walton et al., 2016).

### **5.2.3 Nutrition Service Delivery**

#### **5.2.3.1 Nutrition Care Services and Resources**

In this study, the majority were dissatisfied with nutrition care services provided including user satisfaction evaluation for patients which was not done. In most hospitals set up, the assessment of dietetic services is usually done by peer review and audit, rather than by patient satisfaction surveys (Ferguson et al.,2001). Research suggests that service providers may not always be in tune with their client's expectations and perceptions (Trudeau & Dube, 1995). Therefore, it is important to get the perspective of the client on dietetic services. This is essential to ensure an accurate evaluation of whether the clinical nutrition service meets the patients’ expectations. If patient expectations are not met the measurable outcome of perceived quality of service will be lower.

From the findings in this study, the respondents felt dissatisfied with the hospital administration's willingness to address nutrition queries, concerns, or complaints. Hospital management may not consider food and nutrition services to play a particularly important role in the hospital.

This is evident in a survey conducted in the year 1999 by the Council of Europe where a network consisting of national experts from eight established partial agreement member states were asked questions regarding nutrition programmes in hospitals. Five major problems seemed to be common in this context including lack of involvement from the hospital management (Beck et al., 2001).

Respondents reported having limited nutrition assessment tools and equipment for nutrition evaluation. Moreover, information education and communication materials used for nutrition education were unavailable and nutritional supplements were sometimes provided to patients. Similarly, a study conducted in a Tanzanian hospital with 27 health workers revealed shortages of functioning medical equipment and/or essential medicines and supplements, delays in payment to the suppliers of drugs and equipment, and long procedures to request for out-of-stock medicines were perceived as factors impacting on the delivery of quality of care. (Khamis & Njau, 2016). Lack of essential medical equipment and/or drugs was also observed in several studies in other settings as an important factor influencing the quality of health services (Forster et al., 2006; Assefa & Mosse, 2011; Khori et al., 2012; Penfold et al., 2013). In addition, the majority of the respondents were dissatisfied with the low number of nutritionists employed. The national guidelines for staffing levels in Kenya (MoH,) reported the limited number of health workers such as nutritionists employed in various healthcare facilities. This observation is consistent with studies conducted elsewhere (Forster et al., 2006; Maestad, 2011; Penfold et al., 2013).

### **5.2.3.2 Perception of other health care staff towards nutritionists**

In this study, all the doctors and nurses interviewed were fairly satisfied with hospital nutrition care services offered by nutritionists including the way nutritionists welcomed patients at first-time contact, the way they spoke, listened, treated, and responded to patients queries, concerns and worries. However, the majority were not satisfied with nutritionists' respect towards patients' privacy and confidentiality. Medical professionals are obligated to protect the privacy and confidentiality of their patients. Respect for confidentiality is important to safeguard the well-being of patients and ensure the confidence of society in the doctor-patient relationship.

Cases of breach of confidentiality and violation of privacy have also been reported in several studies (Beltran-Aroca et al., 2016; Blightman, Griffiths & Danbury, 2014)

### **5.2.3.3 Nutrition Care Process**

From our findings, all respondents reported that the nutrition care process structure was used in their dietetic practice with a nutrition care process sheet attached to each patient's medical record. However, most of the respondents, four out five admitted to not always use the nutrition care plan sheet. It is important to note that the nutrition care process is a systematic approach to providing high-quality nutrition care with its application utilized within medical nutrition therapy services worldwide and the use of this process has encouraged consistency in patient care and the evaluation of outcomes. The nutrition care process consists of four distinct, interrelated steps: Nutrition Assessment, Nutrition Diagnosis, Nutrition Intervention, and Nutrition Monitoring and Evaluation (Andersen et al., 2017).

From the findings in this study, all the nutritionists interviewed reported that nutrition assessments which included anthropometric, biochemical, clinical, and dietary assessments were conducted. However, patients were only subjected to nutrition evaluation during hospitalization and in some specific cases; for those at either nutritional risk or with specific nutrition conditions. Nutrition evaluation was not done upon admission or discharge. The nutritional risk continues to be unrecognized and undertreated in clinical practice. Routine screening and assessment of all patients are not always done at hospital admission (Kyle & Coss-Bu, 2010)), although, the need for nutrition assessment is well-recognized and forms part of several national and international guidelines (Reber, 2019). Cases of patients not screened or assessed have been reported in several studies (Barker, Gout & Crowe, 2011; Guaitoli, Jansma & de Vet, 2014).

Education or nutrition information is provided for some patients at hospital discharge, however, improvement on the information provided is needed (Tappenden, 2013). In this study, all nutritionists n=5 (100%) reported to provide instructions to all patients at discharge. However, little is known regarding whether or not patients follow nutritional recommendations provided in hospital or what other strategies are used at home to support their nutritional status (Young et al., 2015). Studies by Beck and colleagues (2013, 2014), found beneficial effects of seeing a dietitian post-discharge, including adding a dietitian to a discharge liaison team (Beck et al., 2013; (Beck et al., 2015).

From our findings on health workers' satisfaction with nutrition care services and practices, it was notably revealed that all health workers n=15 felt very dissatisfied with the hospital follow-up programme for each patient. Follow-ups on a patient's condition on admission and after discharge were sometimes done and delivered or never done with a mean score < 2.8. One study found that 63% of patients who stayed at least 7 days in hospital left in the same nutritional state as they were admitted, and around 20% deteriorated (Allard et al., 2015). Interventions that promote good nutrition and address nutritional deficiencies are needed pre, during, and post-hospitalization to decrease a variety of complications, including mortality and readmission (Laur et al., 2017). As a specialist resource, dietitians are not always consulted or available at the time of discharge (Baker & Wellman, 2005).

#### **5.2.4 Documentation**

High-quality documentation in patient records is essential for patient safety and plays a prominent role in the delivery and evaluation of dietetic/nutrition care. (Lövestam et al., 2014). From the findings, all respondents n=5 (100%) reported that all nutrition information was recorded using the nutrition record sheets with no electronic recording reported in the wards. However, the nutrition information recording was only done if there was a review. From the patient records, it was noted that most patient files had no nutrition record sheets; there was inadequate documentation of nutritional status on hospital admission, inadequate and unsystematic documentation of nutritional information during hospital stay. In a similar study conducted in Norway on perspectives of nurses and undergraduate nurses in hospitals and nursing homes on documentation and communication of nutritional care for elderly hospitalized patients showed inadequate documentation of nutritional treatment and care for elderly patients was in hospital and between health care settings. (Halvorsen et al., 2016)

#### **5.3 Food Service Quality: Patients**

Hospital diet is an integral part of the management of patients admitted to the wards (Mentziou et al., 2014; Ncube & Nesamvuni, 2018). The quality of hospital food plays a major role in determining the overall satisfaction of patients with regard to their hospital stay; it is also an essential component of patient recovery and well-being (Fernando & Wijesinghe, 2017). It is essential for nutritionists and dietitians to be involved in overall patient care and be concerned with aspects such as nutrient intake and hospital food that may affect patient's satisfaction.



Perception on patients' satisfaction with different aspects of food and food service was evaluated in this study. The overall satisfaction of food service and nutrition care quality was generally good reported by 53.2% of the respondents. This result is similar to a study done in the Armed Forces Institute of Cardiology, Pakistan (Zahid et al., 2015), which showed general patient satisfaction of food quality by 45% of the respondents at a mean score of 4.4. Another study was done in Makkah, Saudi Arabia (Abdelhafez et al., 2012), also found out that there was general satisfaction with food and food service by 78.8% of the patients within the hospital. However, this was in contrast with a study conducted in a teaching hospital in Lusaka Zambia (Miyoba & Ogada, 2019) where 64.3% of 98 surgical orthopedic inpatients were not satisfied with the overall quality of hospital food.

This study shows there was a significant association of the general perception of food service and nutrition care quality with nutrition status. This observation was consistent with the findings of a study conducted in Sweden (Josefsson et al., 2017). This, however, was in contrast with a study conducted in Zambia where there was no significant association between the overall quality of hospital food and nutrition status (Miyoba & Ogada, 2019)

The satisfaction level with the variety of food provided in the hospital was low with only 37.24% of the respondents satisfied. This is similar to a Zambian study (Miyoba & Ogada, 2019) conducted among 98 inpatients where only 3.1% of the patients were satisfied with the variety of food provided. However, other studies recorded a higher satisfaction among patients with the variety of foods offered at the hospital, where 85.6% of respondents reported satisfaction (Abdelhafez et al., 2012) and another study showed satisfaction at a mean of 4.27 (Maryam et al., 2015). In this current study, there was also a significant association between patients' satisfaction level with variety of hospital food and nutrition status. Out of the patients who were very dissatisfied with the variety of hospital food, 45.45% of them were underweight and the highest record compared to other categories (normal weight: 36.36%, and overweight: 18.18%). According to the association test, patients who were very dissatisfied with the variety of hospital food were likely to be underweight. This was a significant association with a p-value=0.013. Similarly, a study conducted in Greece among 295 patients in a Greek University hospital reported a significant association between food variety and nutritional status (Tsaousi et al., 2014).

The limited provision of a variety of foods in the current study could be linked to a higher population of inpatients in the wards, limited finances, and unavailability of certain foods such as green leafy vegetables.

#### **5.4 Food service quality: Healthcare staff**

##### **5.4.1 Perception of healthcare staff on hospital food and food service**

Food and food service delivery has become the most important and key components in determining inpatient's overall health care satisfaction (Muraal & Davar, 2014) with quality being an important determinant (Messina et al., 2012; Wright, Connelly & Capra, 2006). In this study, the perception of health workers on different aspects of food and food service was evaluated as an indicator of quality. All the 15 respondents were fairly satisfied with the different aspects of food prepared and served in the hospital. However, eight and three out of the respondents were fairly satisfied and dissatisfied with the variety of food respectively.

There is a dearth of information on hospital staff's perception of hospital food and food service. However, several studies revealed mixed results on inpatients' food service perceptions. Miyoba and Ogada (2019) reported that most patients perceived food quality variety as unsatisfactory similar to this current study; while, Abdelhafez, (2012) showed that patients admitted reported that food quality was satisfactory.

##### **5.4.2 Distribution of meals in the wards**

In this study, it was reported that nutritionists did not accompany meal distribution in the ward. This is similar to a study conducted in Brazil (Diez-Garcia et al., 2012) where only a third of the hospitals studied, out of a total of 37, had their dietitians participating in the distribution of meals in the wards. A qualitative study among forty key informants at five diverse hospitals from four provinces in Canada (Celia Laur et al., 2017) revealed that there was a lack of accountability during meal times as the food service manager was only involved. It is important for food service including distribution of meals to be treated as part of the unit team and every nutritionist should be accountable.

### **5.4.3 Actions supporting diet therapy**

#### **i. Prescribed diets and nutritional supplements**

A food production system that ensures efficient food delivery of the right food to the right patient at the right time is important to improving patient nutrition care (Keller et al.,2014). In this study, all respondents reported all components and activities supporting diet therapy were available. These included a designated special kitchen for the preparation of special diets in the hospital, routine tasting of foods, prescribed diets, and industrialized nutrition supplements provided. However, despite the high number of requests, all respondents felt dissatisfied that supplies of these supplements to the hospital were always delayed, sometimes completely not available, and were very costly. Similar results indicating that the supply of medical drugs including nutrition supplements and their costs is still a problem in most public hospitals have been reported by Khamis and Njau (2016).

All respondents said there was neither a standard diet prescription form, diet manual nor a manual for the standardized diets available in the hospital for consultation. They also reported that there were no normal and special diet recipes in the hospital. Similarly, in a Brazillian study, it was reported that less than half of the public hospitals studied had a standard diet prescription form, good practice manual, and a diet manual. (Diez-Garcia et al. 2012).

#### **ii. Information about energy supply**

Adequate meal consumption that meets patient dietary requirements is necessary to speed recovery from illnesses (Edwards & Hartwell, 2006; Stanga et al., 2003). The hospital follows the 2000kcal recommended by the Ministry of Health when preparing meals for patients. This was particularly tested for meals served per each sitting in the hospital.

However, all of the respondents said it is impossible to obtain information on energy supplied by each type of diet. Diez-Garcia et al., (2012) revealed that information about the energy supplied by diet was unavailable in approximately half of the hospitals out of the 37 hospitals studied in Brazil.

#### **iii. Mechanisms for patients to require changes to the diet**

Meal-ordering systems are an important aspect of hospital food services, informing patients of the available menu choices and supporting the collection of meal orders. However, most public

hospitals in Kenya use cyclic menu systems meaning foods to prepare have already been planned for the whole week. From the findings, all respondents n= 7 (100%) reported only verbal requests were done if patients required changes to their diet. This is in contrast with several studies conducted in different settings where meal ordering systems are either electronically based, written in diet modification forms or visual menus (Ottrey & Porter, 2016; Naithani et al., 2009). However, in these studies, it was reported that regardless of these menu-ordering systems, menus did not provide enough information about the ingredients used and the nutritional value of meals to allow patients to make informed decisions about which meal met their needs. This, therefore, means patients' needs are likely not met hence affecting their outcome and satisfaction (Ottrey & Porter, 2016; Naithani et al., 2009).

## **5.5 Nutrition Status**

The majority of the patients in this study had normal nutrition status as determined by BMI and MUAC on admission and at the time of data collection. The findings are in sharp contrast with most of the studies mentioned below where the percentage of hospital malnutrition is reported to be high. Malnutrition among patients in the hospital is common in developed countries (Burgos et al., 2012; Lamb et al., 2009) with a prevalence rate estimated to be between 20-50% depending on the characteristics of the patient and the method or criteria being used (Norman et al., 2008). This same percentage of prevalence (20-50%) was reported in Australia (Agarwal et al., 2012). According to Aquino and Philipi, (2011) the prevalence of malnutrition among patients in the hospital was reported to be at 60.7% while others report a rate of as high as 65% (Derenet *et al.*, 2014). A report by Agarwal et al., (2011) shows the prevalence of malnutrition among inpatients in the United States and Europe is 31% on average but is higher in other countries like Wales (BAPEN & Russell, 2009). A prevalence of 55.7% of malnutrition was reported in Ethiopia among hospital patients (Haile *et al.*, 2015). There is harmony in most studies in developed and developing countries indicating that this is a problem of high significance (Norman et al., 2008; Ray et al., 2013; Velasco *et al.*, 2011).

Although most studies are in harmony and indicate malnutrition as a significant and common problem in the hospital, there is the negligence of this issue (Tappenden et al., 2013). This is also evident in a study conducted by Norman *et al.*, (2008) which reported that malnutrition in the hospital cannot be easily detected and identified among in-patients and Neelemaat et al., (2011) also demonstrated that this is still a challenge in the hospitals.

From this current cross-sectional study, evaluation of nutrition status was not conclusive as this study did not give a representation of the whole population as nutrition assessment was only done for 24 patients out of 188 respondents upon admission. This is an indication that not all patients were weighed upon admission, despite recommendation by the Ministry of Health via specific guidelines and reference manuals that all patients be screened for risk of malnutrition upon first contact with a health worker (Anyang'Nyong'o, 2010; Kimani & Sharif, 2009). This corresponds with other studies where nutrition assessment has been overlooked such as Australia. However, nutrition assessment on patient admission is mandatory, with satisfactory hospital accreditation dependent on this being carried out, in countries such as the United Kingdom, United States, Netherlands, and some parts of Denmark (Elia, Zellipour & Stratton, 2005).

Several studies have linked hospital malnutrition with longer hospital stays (Abrha et al., 2019; Ringel et al., 2019). In this study, there was a significant association between the length patients stayed in the hospital and the nutrition status where patients who stayed longer in the hospital had a poorer nutrition status ( $p = 0.0006$ ). A retrospective observational study conducted in Brazil to investigate the relationship between the nutritional status (NS) and clinical outcome and length of stay (LOS) among patients admitted to the internal medicine ward reported that longer period of stay by patients was related to the deterioration of their nutrition status (Ordoñez et al., 2013).

The findings of this current study indicate that nutrition status assessment is lacking in most of our public hospitals and overlooked or not considered as a sufficient priority for all patients. Thus of concern knowing that malnutrition remains under-reported and often poorly documented (Luma, 2017). Patients are generally referred to a nutritionist by a medic or a nurse to provide nutritional care and little time often exists for these staff to screen additional patients. It is therefore of concern that many malnourished patients in acute settings are not identified as such, and thereby not referred for nutrition assessment and treatment (Barker, Gout & Crowe, 2011).

A seminal study (Ferguson and Capra, 1998) looking at screening practices of dietitians in Australian hospitals surveyed dietitians on their usual practice and perceived barriers to nutrition risk screening. Of alarm, only 5% of 124 hospitals whose dietitians participated in the survey carried out routine nutrition risk screening, as required by hospital policy. This clearly shows those at nutrition risk or malnourished remain undetected in inpatient settings.

## CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

### 6.1 Conclusion

#### **Findings from the study showed that;**

- i) Patients were generally dissatisfied with nutrition care services and quality including nutrition assessment (weight taking), explanations about nutrition interventions, nutrition education on management of patients' condition, respect for patient's privacy and confidentiality, and follow-ups on their condition and recovery process which are all essential nutrition care processes. This is a clear demonstration of patient-centered care being inadequate.
- ii) From the health care staff findings on nutrition care quality, it was revealed that there was a disconnect and poor collaborative working relationships among health care team, less autonomous nutrition practice, poor patient-centered culture and inadequate staffing; less managerial support actions by the hospital administrations, and inadequate tools, equipment, and resources to ensure the quality of care. The use of nutrition treatment protocols and guidelines was found to be wanting and most were outdated. Documentation was also found to be inadequate and unsystematic with no electronic documentation of nutrition information in the wards.
- iii) There was general satisfaction with different aspects of food and food service quality. However, both patients and health care staff were dissatisfied with food variety. Despite actions supporting diet therapy in the food service including budget autonomy being in place, it was also noted that there was a lack of accountability during the distribution of meals; there was neither a standard diet prescription form, recipe nor diet manuals for both standardized and special diets and only verbal meal ordering system was available
- iv) The nutrition status of the majority of the patients admitted in the medical and surgical wards was normal. However, nutrition assessment was lacking and not prioritized as a fundamental routine exercise. In addition, patients with poor nutritional status stayed longer in the hospital.
- v) There was a significant association between the length patients stayed in hospital, the variety of hospital food, the general perception of hospital food service and nutrition care quality, and nutrition status

## **6.2 Recommendation**

### **6.2.1 Recommendation for policy**

- i) Due to the high level of dissatisfaction by patients on meal variety, the hospital is recommended to increase the variety of food offered to patients
- ii) The Ministry of Health (MoH) should increase the employment of nutrition staff to reduce workload.
- iii) The Ministry of Health (MoH) should provide updated nutrition protocols and guidelines for managing nutrition-related conditions.
- iv) The Ministry of Health (MoH) should facilitate electronic documentation within the hospitals

### **6.2.2 Recommendation for practice**

- i) Nutritionists at Nakuru Level Five hospital should conduct nutrition assessments routinely at the point of admission, during hospitalization, and at discharge, so as quickly detect to patients at risk for malnutrition.
- ii) Hospital diet is an integral part of the management of patients admitted to the wards therefore, the nutritionists and chief cateress should work together in designing the hospital menu, recipes, and diet manuals for both standardized and special meals for patients. This will ensure that meals are patient-focused and patients' needs and expectations met hence optimal patient outcome.
- iii) Health care staffs are accountable for the quality and systematic improvements of nutrition practice therefore evaluation of patients' perceptions and satisfaction levels should be conducted daily by the nutritionists with the help of hospital administration as user satisfaction evaluation is one of the key elements in determining the quality of food and nutrition care provided.
- iv) All health care teams should be involved in patient's nutrition care and support by working with an interdisciplinary team championed by nutritionists to ensure more comprehensive nutrition care across disciplines.

- a. Therefore, emphasis on autonomy, nutrition support teams, and inter-consultations among health care staff should be reinforced in the hospital guidelines.
  
- v) Managerial support actions by the hospital administrations to ensuring patient-centered culture should be integrated within the institutional objectives and strategies as this will enable more positive patient experiences of nutrition care.

### **6.2.3 Recommendation for further research**

- i) A prospective study on food service and nutrition care quality should be conducted where patients are followed from admission to discharge.
  
- ii) An intervention study should be conducted at Nakuru Level Five hospital where different strategies could be adapted such as a validated nutrition care process tool to be used from admission to discharge.
  
- iii) A similar study should be conducted in other public, private, and faith-based hospitals to compare both food service and nutrition care quality in the different setup



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## APPENDICES

### Appendix 1: Conceptual framework

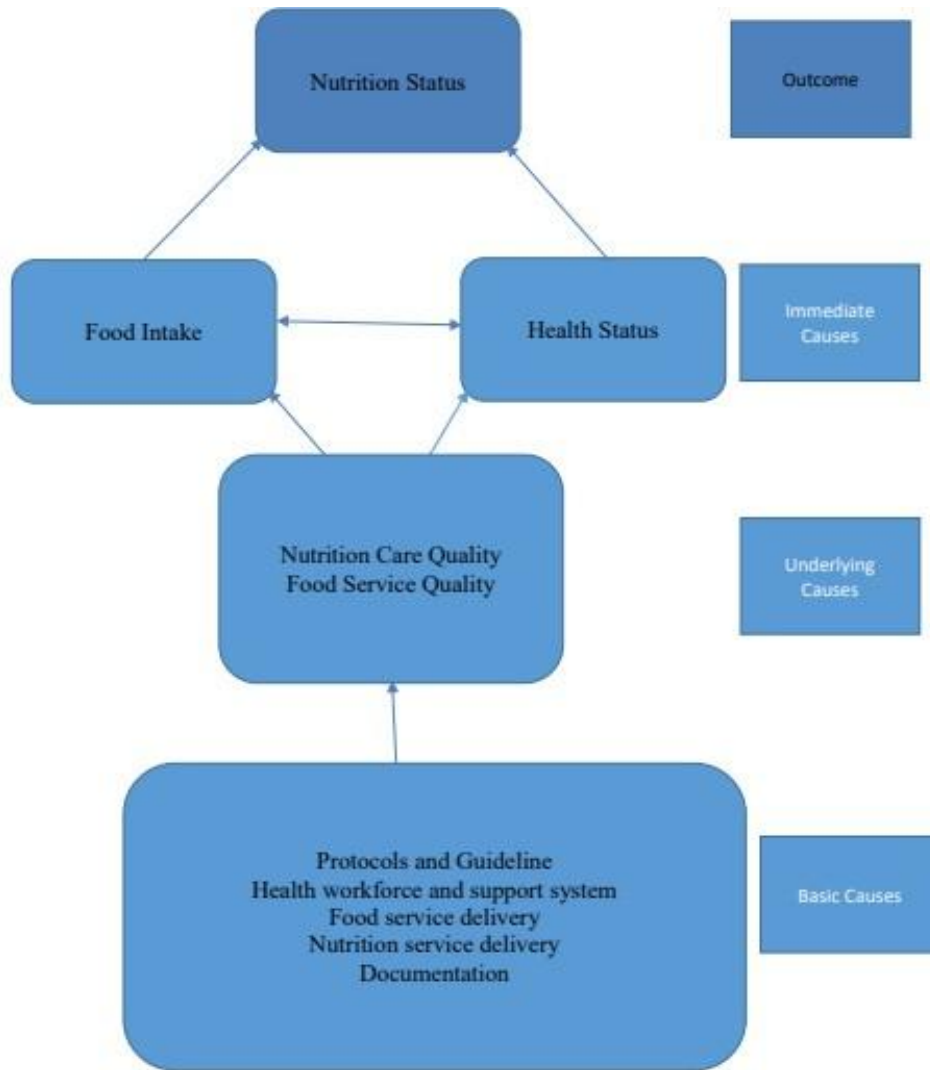


Figure 4.1: Conceptual Framework Adapted from the UNICEF conceptual framework (UNICEF, 2013)

## Appendix 2: University of Nairobi Research Proposal Approval



### UNIVERSITY OF NAIROBI GRADUATE SCHOOL

Telephone: 3318262  
Fax Number: 243626  
Telegrams: "Varsity of Nairobi"  
E-mail: [gs@uonbi.ac.ke](mailto:gs@uonbi.ac.ke)  
**Our Ref:** A56/88065/2015

P. O. Box 30197 - 00100  
NAIROBI, KENYA

February 24, 2018

Kiprono Susan Jepkoech  
C/o Chairman  
Department of Food Science, Nutrition & Technology  
**CAVS**

Dear Ms. Kiprono,

#### **RESEARCH PROPOSAL AND SUPERVISORS**

This is to inform you that the Director, Graduate School has approved your MSc. research proposal titled: "**Nutrition care and food science quality in Nakuru Provincial General Hospital, Kenya**".

He has also approved **Dr. Angela Andago** and **Dr. Lucy Njue** as the supervisors of your thesis.

You should therefore begin consulting them and ensure that you submit your thesis for examination on or before the end of August 2018. The Guidelines on Postgraduate Supervision can be accessed on our website ([www.gs.uonbi.ac.ke](http://www.gs.uonbi.ac.ke)) while the Research Notebook is available at the University Bookstore.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Catherine Njue'.

**CATHERINE NJUE (MS.)**  
**FOR: DIRECTOR, GRADUATE SCHOOL**

cc . Dean, Faculty of Agriculture  
Chairman, Department of Food Science, Nutrition & Technology  
Dr. Angela Andago-(Supervisor)  
Dr. Lucy Njue-(Supervisor)

AMS/gwg

### Appendix 3: Ethical Approval by KNH-UON ERC



UNIVERSITY OF NAIROBI  
COLLEGE OF HEALTH SCIENCES  
P O BOX 19676 Code 00202  
Telegrams: varsity  
Tel:(254-020) 2726300 Ext 44355

#### KNH-UON ERC

Email: [uonknh\\_erc@uonbi.ac.ke](mailto:uonknh_erc@uonbi.ac.ke)  
Website: <http://www.erc.uonbi.ac.ke>  
Facebook: <https://www.facebook.com/uonknh.erc>  
Twitter: @UONKNH\_ERC [https://twitter.com/UONKNH\\_ERC](https://twitter.com/UONKNH_ERC)



KENYATTA NATIONAL HOSPITAL  
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Ref: KNH-ERC/A/222

Susan Jepkoech Kirono  
Reg. No.A56/88065/2016  
Dept. of Food Science Nutrition and Technology  
Faculty of Agriculture  
College of Agriculture and Veterinary Services  
University of Nairobi



June 13, 2018

Dear Susan

**RESEARCH PROPOSAL – NUTRITION CARE AND FOOD SERVICE QUALITY IN NAKURU PROVINCIAL GENERAL HOSPITAL, KENYA (P113/03/2018)**

This is to inform you that the KNH- UoN Ethics & Research Committee (KNH- UoN ERC) has reviewed and approved your above research proposal. The approval period is from 13<sup>th</sup> June 2018 – 12<sup>th</sup> June 2019.

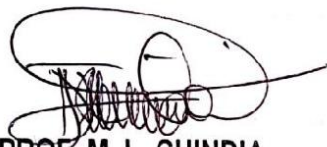
This approval is subject to compliance with the following requirements:

- a) Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- b) All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH-UoN ERC before implementation.
- c) Death and life threatening problems and serious adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH-UoN ERC within 72 hours of notification.
- d) Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH- UoN ERC within 72 hours.
- e) Clearance for export of biological specimens must be obtained from KNH- UoN ERC for each batch of shipment.
- f) Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
- g) Submission of an *executive summary* report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/ or plagiarism.

Protect to discover

For more details consult the KNH- UoN ERC website <http://www.erc.uonbi.ac.ke>

Yours sincerely,



**PROF. M. L. CHINDIA**  
**SECRETARY, KNH-UoN ERC**

- c.c.     The Principal, College of Health Sciences, UoN  
          The Deputy Director, CS, KNH  
          The Chairperson, KNH-UON ERC  
          The Assistant Director, Health Information, KNH  
          The Chair, Dept. of Food Science, Nutrition and Technology, UoN  
          Supervisors: Dr. Angela Andago, Dr. Lucy Njue

**Appendix 4: Approval to conduct research by Nakuru Level Five Hospital**

Susan Jepkoech Kiprono (A56/88065/2016),  
Department of Food Science, Nutrition and Technology  
University of Nairobi,  
Nairobi  
15<sup>th</sup> May, 2018

To:

The Medical Superintendent,  
Nakuru Level 5 Hospital,  
P.O Box 71-20100,  
NAKURU.



15/5/2018  
Approved  
- To pay 3800/- Fee  
- Copies to H.R.D.  
S. J. K. Deputy Med. Sup.

Dear Sir,

**RE: REQUEST TO CONDUCT RESEARCH ON NUTRITION CARE AND FOOD SERVICE QUALITY IN NAKURU LEVEL 5 HOSPITAL, KENYA**

Reference is made to the above subject. I have completed a Bachelor of Science degree in Food Nutrition and Dietetics at Egerton University Njoro Campus with first class honors and currently undertaking my Masters in Applied Human Nutrition at the University of Nairobi. I kindly write to ask for permission to carry out my master's research in your institution to complement my basic training in Applied Human Nutrition between June and July, 2018. My work is currently under ethical review\_ KNH-UON Ethics and Research Committee awaiting final approval.

The following are the specific objectives of my study:

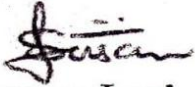
1. To assess nutritional status of adult patients admitted for a minimum of 1 week in Nakuru Level 5 hospital.
2. To determine the knowledge, attitudes and experience of nutritionists in prioritizing good nutrition services in Nakuru Level 5 hospital.
3. To assess perceived quality of food service and nutrition care by patients and other health care staff in Nakuru Level 5 hospital.
4. To assess the nutrient adequacy of hospital diets in meeting the nutritional requirements of patients in Nakuru Level 5 hospital.

The study will help generate data on nutrition care and food service quality and will provide a vivid picture of how quality of care affects patient's clinical outcome.

Kindly find attached my full research proposal and a copy of the approval letter to conduct the research from graduate school, University of Nairobi.

1  
To Report to the relevant Departments/Wards etc. - medical/surgical  
S. J. K.  
15/5/2018

Yours sincerely,



Susan Jepkoech Kiprono,

Mobile: 0727593715

Email: [suezem@gmail.com](mailto:suezem@gmail.com)

c.c. NPGH\_Head Nutrition Department  
NPGH\_Students Coordinator

## Appendix 5: Consent form for healthcare staff

### **PARTICIPANT INFORMATION AND CONSENT FORM FOR ENROLLMENT IN THE STUDY FOR HEALTHCARE STAFF**

#### **Introduction**

**Title of Study:** Assessment of Food Service, Nutrition Care and Nutrition Status of Hospitalized Patients at Nakuru Level Five Hospital, Kenya

**Principal Investigator\and institutional affiliation:** Susan Jepkoech Kiprono, University of Nairobi

#### **Co-Investigators and institutional affiliation:**

James Mburu, Kenyatta University

Arthur Lord Mwangi, Egerton University

Ruth Adongo, Egerton University

Mercy Mukhwana, Egerton University

Stella Njogu, Egerton University

#### **Introduction**

My name is Susan Jepkoech Kiprono, a postgraduate student at University of Nairobi, Kenya pursuing Master of Science in Applied Human Nutrition. I would like to tell you about a study on nutrition care and food service quality in Nakuru Level Five Hospital, Kenya being conducted by the above listed researchers.

The purpose of this consent form is to give you the information you will need to help you decide whether or not to be a participant in the study. Feel free to ask any questions about the purpose of the research, what happens if you participate in the study, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When we have answered all your questions to your satisfaction, you may decide to be in the study or not. This process is called 'informed consent'. Once you understand and agree to be in the study, I will request you to sign your name on this form. You should understand the general principles which apply to all participants in a medical research:

- i) Your decision to participate is entirely voluntary
- ii) You may withdraw from the study at any time without necessarily giving a reason for your withdrawal
- iii) Refusal to participate in the research will not



affect the services you are entitled to in this health facility or other facilities. We will give you a copy of this form for your records.

May I continue?           **YES / NO**

This study has approval by The Kenyatta National Hospital-University of Nairobi Ethics and Research Committee Protocol No: **P113/03/2018**

### **Study procedures**

The focus of this study is on health care staff and adult patients above 18 years and less than or equal to 65 years of age admitted in this hospital. The findings of this study may help identify gaps in the hospital diet; food service delivery and nutrition care in general so that corrective action is taken.

I and my five research assistants will ask you questions on; 1) Administrative details, 2) Characteristics of the hospital 3) Structure of the hospital nutrition unit/ department 4) the nutritionists' activities in hospital wards, 5) the nutritionists' activities of management of food service within the hospital 6) Other addition information related to food intake of patients, hospital diet characteristics and supplementation of hospital food.

### **Benefits**

The findings of this study may help identify gaps in the hospital diet. The results of this research may also help inform other hospitals on nutrient intake of inpatients so they can improve on the quality of hospital meals and nutrition care of patients. This may contribute to patient's quick recovery from illness and reduce on costs to both the patients and hospitals. This research will also contribute towards improving the food and nutrition care quality in the Kenya health system in particularly the Kenyan public hospitals

### **Risks**

This research does not involve any invasive procedures such as collection of blood and therefore poses no risks.

### **Rights**

Participation in this research is voluntary. You are at liberty not to participate in this study and non-participation will not interfere with hospital service delivery. During the course of the interview, you are free to decline to answer any question you don't want to or are uncomfortable with. In that case, we can skip that question and proceed to other questions. You are also free to end the interview any time you feel like. However, we encourage you to participate fully as the information collected will benefit the health care team, the patients as well as provide valuable information to hospitals.

**Confidentiality**

Whatever information you provide will be kept in confidence and will not be shared with any other persons other than my supervisors. Furthermore, your identity will be withheld and the results of the study will not make any mention of a particular participant. The findings of the study are basically for research purposes.

**Compensation**

This study does not offer any payments to the participants. However, we would very much appreciate your participation in this research since your views are important.

**Complaints and/or queries**

This study has been approved by Nakuru Level Five Hospital administration and granted ethical clearance by KNH-UoN Ethics and Research Committee based along old Mbagathi Road, off Ngong Road, in Nairobi. In case of any complaints and/or queries regarding this study, kindly contact the following persons:

1. The Chairperson  
Kenyatta National Hospital/ University of Nairobi Ethics and Research Committee  
College of Health Sciences  
P. O. Box 19676- 00202  
Nairobi  
Tel. (254-020) 2726300-9 Ext 44355  
E-mail: [uonknh\\_erc@uonbi.ac.ke](mailto:uonknh_erc@uonbi.ac.ke)
2. Susan Jepkoech Kiprono

Egerton University,  
P.O Box 536  
Njoro.  
Principal Investigator Mobile:  
0727593715

**CONSENT FORM (STATEMENT OF CONSENT)**

**Participant’s statement**

I have been duly informed about the nature and purpose of the research and the researcher has also mentioned the benefits of conducting the study. It is evident that there are no invasive procedures in this study and hence no risks associated with it. The information provided in this research may help to improve hospital diets, nutrition care and enhance diet satisfaction of patients. I have been assured of confidentiality on any information that will be shared. Participation in this study is voluntary and I have willingly accepted to participate in the research.

Participants name: .....

Signature or thumb print of Interviewee: ..... Date.....

**Researcher’s statement**

I, the undersigned, have fully explained the relevant details of this research study to the participant named above and believe that the participant has understood and has willingly and freely given his/her consent.

**Researcher’s Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Signature**

\_\_\_\_\_

**Role in the study:** \_\_\_\_\_

For more information, contact \_\_\_\_\_ at \_\_\_\_\_ from  
\_\_\_\_\_ to \_\_\_\_\_

**FOMU YA IDHINI NA USHIRIKI YA UANDIKISHAJI WA UTAFITI YA WAHUDUMU WA AFYA**

**Kichwa cha Utafiti:** Ubora wa Huduma za Lishe Bora na Chakula katika Hospitali Kuu ya Nakuru, Kenya.

**Mtafiti Mkuu na ushirikiano wa taasisi:** Susan Jepkoech Kiprono, Chuo Kikuu cha Nairobi

**Wachunguzi wa ushirikiano na ushirika wa taasisi:**

James Mburu, Chuo Kikuu cha Kenyatta

Arthur Lord Mwangi Gichuru, Chuo Kikuu cha Egerton

Ruth Adongo, Chuo Kikuu cha Egerton

Mercy Mukhwana, Chuo Kikuu cha Egerton

Stella Njogu, Chuo Kikuu cha Egerton

**Utangulizi:**

Jina langu ni Susan Jepkoech Kiprono, mwanafunzi wa Elimu ya juu katika Chuo kikuu cha Nairobi, Kenya. Nasomea katika uwanja wa lishe bora. Ningependa kukuambia kuhusu utafiti wa ubora wa huduma za lishe bora na chakula katika hospitali kuu ya Nakuru, Kenya utakaofanywa na watafiti waliotajwa hapo juu.

Kusudi ya fomu hii ya idhini ni kukupa taarifa unayohitaji ili kukusaidia kuamua ushiriki wako katika utafiti. Jihisi huru kuuliza maswali yoyote kuhusu madhumuni ya utafiti, kinachotokea ikiwa unashiriki katika utafiti, hatari na faida iwezekanavyo, haki zako kama kujitolea, na kitu kingine chochote kuhusu utafiti au fomu hii ambayo haijulikani. Tukijibu maswali yako yote kwa kuridhika kwako, unaweza kuamua kuwa katika utafiti au la. Hii mchakato huitwa 'kibali cha habari'. Mara unapoelewa na kukubali kuwa katika utafiti, nitakuomba upige sahihi ishara ya jina lako kwenye fomu hii. Unapaswa kuelewa kanuni za jumla zinazohusu washiriki wote katika utafiti wa matibabu: i) Uamuzi wako wa kushiriki ni kikamilifu kwa hiari ii) Unaweza kujiondoa kutoka kwenye utafiti wakati wowote bila kutoa sababu ya kujiondoa kwako iii) Kukataa kushiriki katika utafiti hauathiri huduma unazostahili katika afya hii kituo au vifaa vingine. Tutakupua nakala ya fomu hii kwa rekodi zako.

Naweza kuendelea?

**NDIO**

**LA**

Utafiti huu una kibali na Kliniki ya Taifa ya Kenyatta-Chuo Kikuu cha Maadili ya Nairobi na Kamati ya Utafiti wa Nambari: **P113/03/2018**

### **Mtindo wa utafiti**

Lengo la utafiti ni kwa wahudumu wa afya na wagonjwa wazima wenye miaka kumi na minane au zaidi ya kumi na minane (18) na ambao hawajapitisha miaka sitini na tano (65) waliolazwa hospitalini. Matokeo ya utafiti huu yataweza kutusaidia kujua vipengo vya hospitalini kwa mfano huduma ya chakula na lishe bora kwa jumla ilikusuluhisha shida lolote.

Mimi na watafiti wenzangu watano tutakuuliza maswali yalioguzia; 1) uendeshaji wa hospitali kwa jumla, 2) Hulka za hospitali, 3) Muundo wa idara ya lishe bora hospitalini 4) Shughuli za afisa wa lishe bora hospitalini. 5) Shughuli za Afisa wa lishe bora katika huduma za chakula hospitalini 6) Taarifa yoyote nyingine yalioguzia ulaji wa chakula wa wagonjwa waliolazwa na hulka ya chakula hospitalini na nyongeza za chakula cha hospitali.

### **Faida**

Matokeo ya utafiti huu yatasaidia kujua vipengo katika mpango wa chakula hospitalini. Matokeo ya utafiti huu yanaweza saidia kujulisha hospitali nyingine zozote kuhusu lishe bora kwa wagonjwa waliolazwa hospitalini ili kuboresha ubora wa chakula hospitalini na lishe bora. Wagonjwa hivyo basi watapona haraka na kupunguza gharama ya wagonjwa hospitalini. Utafiti huenda kusaidia lishe bora nchini Kenya na hasa Hospitali za Umma nchini Kenya.

### **Hatari**

Utafiti huu hauna hatari kwa sababu hautajumuisha mitindo kama ukusanyaji wa damu na kadhalika.

### **Haki**

Ushiriki wa utafiti ni kwa hiari. Una haki ya kutoshiriki katika hii utafiti na kutoshiriki kwako hayataingilia kati uendeshaji wa huduma za hospitalini. Wakati wa kuhojiwa, mhojiwa anahuru ya kutojibu swali ambalo utamtia wasiwasi. Hivyo mhoji ataruka hilo swali na kuenda kwa jingine.

Pia mhojiwa anahuru ya kutamatisha mahojiano wakati wowote. Hata hivyo, tunakuhimiza umalize mahojiano kwa maana matokeo ya utafiti huu utasaidia hospitali kwa kuendesha huduma bora.

**Usiri**

Data yoyote utakayotupea itahifadhiwa kwa siri na haitapewa na mtu yeyote mwingine ama msimamizi yeyote. Aidha, utambulisho wako utahifadhiwa na matokeo ya utafiti hautataja majina ya washiriki. Matokeo ni kwa jinsi ya utafiti pekee.

**Fidia**

Utafiti huu hauhusishi kulipwa kwa wanashiriki. Aidha, tutashukuru ushiriki wako kwa utafiti huu kwa ajili maoni yako ni ya muhimu.

**Malamiko**

Utafiti huu Umekubaliwa na Hospitali kuu ya Kaunti ya Nakuru na kimepewa kibali cha maadili na kamitii ya KNH-UON, iliyonjiani Mbagathi, huko Nairobi. Malamiko yoyote kuhusu utafiti huu, tafadhali wajulishe hao wanao husika:

1) Mwenyekiti

Kamtiii ya maadili ya KNH-UON

Chuo cha sayansi ya afya

P.O.Box 19676-00202

Nairobi

Tel (254-020) 2726300-9 Ext 443555

Email: [uonknh\\_erc@uonbi.ac.ke](mailto:uonknh_erc@uonbi.ac.ke)

2) Susan Jepkoech Kiprono

Egerton University

P.O. Box 536

Njoro

Principal Investigator

Mobile : 0727593715

**Fomu ya Uhini**

Nimejulishwa kuhusu hali na lengo la utafiti huu na mtafiti amenijulisha faida ya utafiti huu. Ni hakika hakuna hatari yoyote kwa kushiriki kwa utafiti huu. Data ya utafiti huu itasaidia kuboresha chakula na lishe bora ya hospitali na kuridhika kwa wagonjwa waliolazwa. Nimehakikishiwa usiri wa ushiriki wangu kwa utafiti huu na ninakubali kushiriki kwa utafiti huu kwa hiari yangu.

**Jina la Mshiriki:**.....

**Sahihi au chapa ya kidole gumba** .....

**Tarehe:**.....

**Taarifa ya Mtafiti**

Mimi, aliyechaguliwa, ameelezea kikamilifu maelezo muhimu ya utafiti huu wa utafiti kwa mshiriki jina lake hapo juu na kuamini kwamba mshiriki ameelewa na amepewa kwa hiari na kwa uhuru kibali chake.

**Jina la Mtafiti :** \_\_\_\_\_

**Tarehe :** \_\_\_\_\_

**Saini** \_\_\_\_\_

**Jukumu katika utafiti :** \_\_\_\_\_ *[ yaani utafiti wa wafanyakazi ambao walielezea fomu ya kibali cha habari.]*

Kwa habari zaidi wasiliana \_\_\_\_\_ kwa \_\_\_\_\_ kutoka

\_\_\_\_\_ kwa \_\_\_\_\_

## Appendix 6: Consent form for patients

### **PARTICIPANTS INFORMATION AND CONSENT FORM FOR ENROLLMENT IN THE STUDY FOR PATIENTS**

#### **Introduction**

**Title of Study:** Assessment of Food Service, Nutrition Care and Nutrition Status of Hospitalized Patients at Nakuru Level Five Hospital, Kenya

**Principal Investigator\and institutional affiliation:** Susan Jepkoech Kiprono, University of Nairobi

#### **Co-Investigators and institutional affiliation:**

James Mburu, Kenyatta University

Arthur Lord Mwangi, Egerton University

Ruth Adongo, Egerton University

Mercy Mukhwana, Egerton University

Stella Njogu, Egerton University

#### **Introduction:**

My name is Susan Jepkoech Kiprono, a postgraduate student at University of Nairobi, Kenya pursuing Master of Science in Applied Human Nutrition. I would like to tell you about a study on nutrition care and food service quality in Nakuru Provincial General Hospital, Kenya being conducted by the above listed researchers.

The purpose of this consent form is to give you the information you will need to help you decide whether or not to be a participant in the study. Feel free to ask any questions about the purpose of the research, what happens if you participate in the study, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When we have answered all your questions to your satisfaction, you may decide to be in the study or not. This process is called 'informed consent'. Once you understand and agree to be in the study, I will request you to sign your name on this form. You should understand the general principles which apply to all participants in a medical research: i) Your decision to participate is entirely voluntary ii) You may withdraw from the study at any time without necessarily giving a reason for your



withdrawal iii) Refusal to participate in the research will not affect the services you are entitled to in this health facility or other facilities. We will give you a copy of this form for your records.

May I continue?           **YES / NO**

This study has approval by The Kenyatta National Hospital-University of Nairobi Ethics and Research Committee Protocol No: **P113/03/2018**

### **Study procedures**

The focus of this study is on health care staff and adult patients above 18 years and less than or equal to 65 years of age admitted in this hospital. The findings of this study may help identify gaps in the hospital diet; food service delivery and nutrition care in general so that corrective action is taken.

I and my four research assistants will ask you questions on; 1) demographic, education and socio-economic characteristics, 2) whether you are satisfied with certain aspects of hospital meals/ food and food services 3) Your perception on hospital nutrition care services in terms of patients' experiences, challenges and expectations about nutritionists 4) the type of foods and beverages you ate yesterday, 3) the frequency of eating certain foods and beverages over the past seven days, 4) Other addition information related to food intake including supplementation of hospital food and nutrition status. A standard elastic MUAC tape will be used to measure the size of your mid upper arm and we will also take your weight and height measurements.

### **Benefits**

The findings of this study may help identify gaps in the hospital diet. The results of this research may also help inform other hospitals on nutrient intake of inpatients so they can improve on the quality of hospital meals and nutrition care of patients. This may contribute to patient's quick recovery from illness and reduce on costs to both the patients and hospitals. This research will also contribute towards improving the food and nutrition care quality in the Kenya health system in particularly the Kenyan public hospitals

### **Risks**

This research does not involve any invasive procedures such as collection of blood and therefore poses no risks.

### **Rights**

Participation in this research is voluntary. You are at liberty not to participate in this study and non-participation will not interfere with hospital service delivery. During the course of the interview, you are free to decline to answer any question you don't want to or are uncomfortable with. In that case, we can skip that question and proceed to other questions. You are also free to end the interview any time you feel like. However, we encourage you to participate fully as the information collected will benefit the patients as well as provide valuable information to hospitals.

### **Confidentiality**

Whatever information you provide will be kept in confidence and will not be shared with any other persons other than my supervisors. Furthermore, your identity will be withheld and the results of the study will not make any mention of a particular patient. The findings of the study are basically for research purposes.

### **Compensation**

This study does not offer any payments to the patients. However, we would very much appreciate your participation in this research since your views are important.

### **Complaints and/or queries**

This study has been approved by Nakuru Provincial General Hospital administration and granted ethical clearance by KNH-UoN Ethics and Research Committee based along old Mbagathi Road, off Ngong Road, in Nairobi. In case of any complaints and/or queries regarding this study, kindly contact the following persons:

1. The Chairperson  
Kenyatta National Hospital/ University of Nairobi Ethics and Research Committee

College of Health Sciences  
P. O. Box 19676- 00202  
Nairobi  
Tel. (254-020) 2726300-9 Ext 44355  
E-mail: [uonknh\\_erc@uonbi.ac.ke](mailto:uonknh_erc@uonbi.ac.ke)

- 2. Susan Jepkoech Kiprono  
Egerton University,  
P.O Box 536  
Njoro.  
Principal Investigator  
Mobile: 0727593715

**CONSENT FORM (STATEMENT OF CONSENT)**

**Participant’s statement**

I have been duly informed about the nature and purpose of the research and the researcher has also mentioned the benefits of conducting the study. It is evident that there are no invasive procedures in this study and hence no risks associated with it. The information provided in this research may help to improve hospital diets, nutrition care and enhance diet satisfaction of patients. I have been assured of confidentiality on any information that will be shared. Participation in this study is voluntary and I have willingly accepted to participate in the research.

Participants Name.....  
Signature or thumb print of Interviewee.....  
Date.....

**Researcher’s statement**

I, the undersigned, have fully explained the relevant details of this research study to the participant named above and believe that the participant has understood and has willingly and freely given his/her consent.

**Researcher ‘s Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Signature** \_\_\_\_\_

**Role in the study:** \_\_\_\_\_

For more information, contact \_\_\_\_\_ at \_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_

**FOMU YA IDHINI NA USHIRIKI YA UANDIKISHAJI WA UTAFITI YA WAGONJWA**

**Kichwa cha Utafiti:** Ubora wa Huduma za Lishe Bora na Chakula katika Hospitali Kuu ya Nakuru, Kenya.

**Mtafiti Mkuu na ushirikiano wa taasisi:** Susan Jepkoech Kiprono, Chuo Kikuu cha Nairobi

**Wachunguzi wa ushirikiano na ushirika wa taasisi:**

James Mburu, Chuo Kikuu cha Kenyatta

Arthur Lord Mwangi Gichuru, Chuo Kikuu cha Egerton

Ruth Adongo, Chuo Kikuu cha Egerton

Mercy Mukhwana, Chuo Kikuu cha Egerton

Stella Njogu, Chuo Kikuu cha Egerton

**Utangulizi:**

Jina langu ni Susan Jepkoech Kiprono, mwanafunzi wa Elimu ya juu katika Chuo kikuu cha Nairobi, Kenya. Nasomea katika uwanja wa lishe bora. Ningependa kukuambia kuhusu utafiti wa ubora wa huduma za lishe bora na chakula katika hospitali kuu ya Nakuru, Kenya utakaofanywa na watafiti waliotajwa hapo juu.

Kusudi ya fomu hii ya idhini ni kukupa taarifa unayohitaji ili kukusaidia kuamua ushiriki wako katika utafiti. Jihisi huru kuuliza maswali yoyote kuhusu madhumuni ya utafiti, kinachotokea ikiwa unashiriki katika utafiti, hatari na faida iwezekanavyo, haki zako kama kujitolea, na kitu kingine chochote kuhusu utafiti au fomu hii ambayo haijulikani. Tukijibu maswali yako yote kwa kuridhika kwako, unaweza kuamua kuwa katika utafiti au la . Hii mchakato huitwa 'kibali cha habari'. Mara unapoelewa na kukubali kuwa katika utafiti, nitakuomba upige sahihi ishara ya jina lako kwenye fomu hii. Unapaswa kuelewa kanuni za jumla zinazohusu washiriki wote katika utafiti wa matibabu: i) Uamuzi wako wa kushiriki ni kikamilifu kwa hiari ii) Unaweza kujiondoa kutoka kwenye utafiti wakati wowote bila kutoa sababu ya kujiondoa kwako iii) Kukataa kushiriki katika utafiti hauathiri huduma unazostahili katika afya hii kituo au vifaa vingine. Tutakupa nakala ya fomu hii kwa rekodi zako.

Naweza kuendelea?

**NDIO**

**LA**

Utafiti huu una kibali na Kliniki ya Taifa ya Kenyatta-Chuo Kikuu cha Maadili ya Nairobi na Kamati ya Utafiti wa Nambari: **P113/03/2018**

### **Mtindo wa utafiti**

Lengo la utafiti ni kwa wahudumu wa afya na wagonjwa wazima wenye miaka kumi na minane au zaidi ya kumi na minane (18) na ambao hawajapitisha miaka sitini na tano (65) waliolazwa hospitalini. Matokeo ya utafiti huu yataweza kutusaidia kujua vipengo vya hospitalini kwa mfano huduma ya chakula na lishe bora kwa jumla ilikusuluhisha shida lolote.

Mimi na watafiti wenzangu wanne tutakuuliza maswali yalioguzia; 1) Wasifu, masomo yako na sifa za kiuchumi za kijamii 2) Mtazamo wako juu ya huduma za chakula katika hospitali, wa huduma upande wa lishe bora kwa suala la changamoto, mahitaji na matarajio yako kuhusu huduma ya afisa wa lishe bora katika wodi 3) Aina ya chakula na vinywaji ulioila jana 4) Marudio ya chakula fulani kwa wiki moja uliopita 5) Maswali yoyote nyingine yanayoguzia ulaji ikiwa pamoja na uongezaji wa chakula cha hospitali na hadhi ya lishe bora. Utepe wa MUAC itatunika kupima ukubwa wa mkono wa katikati juu na pia kuchukua vipimo vya uzito na urefu.

### **Faida**

Matokeo ya utafiti huu yatasaidia kujua vipengo katika mpango wa chakula hospitalini. Matokeo ya utafiti huu yanaweza saidia kujulisha hospitali nyingine zozote kuhusu lishe bora kwa wagonjwa waliolazwa hospitalini ili kuboresha ubora wa chakula hospitalini na lishe bora. Wagonjwa hivyo basi watapona haraka na kupunguza gharama ya wagonjwa hospitalini. Utafiti huenda kusaidia lishe bora nchini Kenya na hasa Hospitali za Umma nchini Kenya.

### **Hatari**

Utafiti huu hauna hatari kwa sababu hautajumuisha mitindo kama ukusanyaji wa damu na kadhalika.

### **Haki**

Ushiriki wa utafiti ni kwa hiari. Una haki ya kutoshiriki katika hii utafiti na kutoshiriki kwako hayataingilia kati uendeshaji wa huduma za hospitalini. Wakati wa kuhojiwa, mhojiwa anahuru ya

kutojibu swali ambalo utamtia wasiwasi. Hivyo mhoji ataruka hilo swali na kuenda kwa jingine. Pia mhojiwa anahuru ya kutamatisha mahojiano wakati wowote. Hata hivyo, tunakuhimiza umalize mahojiano kwa maana matokeo ya utafiti huu utasaidia hospitali kwa kuendesha huduma bora.

**Usiri**

Data yoyote utakayotupea itahifadhiwa kwa siri na haitapewa na mtu yeyote mwingine ama msimamizi yeyote. Aidha, utambulisho wako utahifadhiwa na matokeo ya utafiti hautataja majina ya washiriki. Matokeo ni kwa jinsi ya utafiti pekee.

**Fidia**

Utafiti huu hauhusishi kulipwa kwa wanashiriki. Aidha, tutashukuru ushiriki wako kwa utafiti huu kwa ajili maoni yako ni ya muhimu.

**Malamiko**

Utafiti huu Umekubaliwa na Hospitali kuu ya Kaunti ya Nakuru na kimepewa kibali cha maadili na kamitii ya KNH-UON, iliyonjiani Mbagathi, huko Nairobi. Malamiko yoyote kuhusu utafiti huu, tafadhali wajulishe hao wanao husika:

1) Mwenyekiti

Kamitii ya maadili ya KNH-UON

Chuo cha sayansi ya afya

P.O.Box 19676-00202

Nairobi

Tel (254-020) 2726300-9 Ext 443555

Email: [uonknh\\_erc@uonbi.ac.ke](mailto:uonknh_erc@uonbi.ac.ke)

2) Susan Jepkoech Kiprono

Egerton University

P.O. Box 536

Njoro

Principal Investigator

Mobile : 0727593715

**Fomu ya Uhini**

Nimejulishwa kuhusu hali na lengo la utafiti huu na mtafiti amenijulisha faida ya utafiti huu. Ni hakika hakuna hatari yoyote kwa kushiriki kwa utafiti huu. Data ya utafiti huu itasaidia kuboresha chakula na lishe bora ya hospitali na kuridhika kwa wagonjwa waliolazwa. Nimehakikishiwa usiri wa ushiriki wangu kwa utafiti huu na ninakubali kushiriki kwa utafiti huu kwa hiari yangu.

**Jina la Mshiriki:** .....**Sahihi au chapa ya kidole gumba** .....**Tarehe:** .....**Taarifa ya Mtafiti**

Mimi, aliyechaguliwa, ameeleza kikamilifu maelezo muhimu ya utafiti huu wa utafiti kwa mshiriki jina lake hapo juu na kuamini kwamba mshiriki ameelewa na amepewa kwa hiari na kwa uhuru kibali chake.

**Jina la Mtafiti :** \_\_\_\_\_**Tarehe :** \_\_\_\_\_**Saini** \_\_\_\_\_

**Jukumu katika utafiti :** \_\_\_\_\_ [ yaani utafiti wa wafanyakazi ambao walielezea fomu ya kibali cha habari.]

Kwa habari zaidi wasiliana \_\_\_\_\_ kwa \_\_\_\_\_

kutoka \_\_\_\_\_ kwa \_\_\_\_\_

## Appendix 7: Patients Questionnaire

### QUESTIONNAIRE ON ASSESSMENT OF FOOD SERVICE, NUTRITION CARE QUALITY AND NUTRITIONAL STATUS OF ADMITTED PATIENTS IN NAKURU LEVEL FIVE HOSPITAL QUESTIONNAIRE FOR MEDICAL AND SURGICAL PATIENTS

Questionnaire Code No.								
Date of the interview (dd/mm/yyyy)	d	d	m	m	y	y	y	y
Participant initials	_____							
Hospital Name	<input type="checkbox"/> Nakuru PGH				<input type="checkbox"/> Other			
Ward	<input type="checkbox"/> Surgical				<input type="checkbox"/> Medical			
Start time		H	H	M	M			
End time		H	H	M	M			
Name of interviewer (Initials)	_____							
Checked by (Initials)	_____							

#### Introduction to the participant:

My name is (name). I am a Masters student from University of Nairobi and interested in the assessing the nutritional care and food service quality in Level Five hospitals within Kenya. Therefore, I would like to inquire about the nutritional care you are receiving and quality of food service more specifically within Nakuru Level Five hospital.

It is important for you to understand that your participation in this study is completely voluntary. I would be grateful if you would agree to participate in this study, but do feel free to refuse. If you refuse, there will be no consequence for you and you will receive whatever care and treatment you need at the health facility as usual. If you decline to participate you will not lose any benefit that you are entitled to such as receiving care and support that is provided at the hospital.

If you choose to participate in this study you need to know that you may withdraw from the study at any stage without giving any explanation for your withdrawal. Your answers will be kept confidential. We will NOT provide this information to anyone including after the end of the study.

This survey will take about 30 - 45 minutes.

#### Specific Objectives

1. To evaluate perceived quality of nutrition care and food service among hospitalized patients at Nakuru Level Five Hospital.
2. To evaluate perceived quality of nutrition care and food service among healthcare staff at Nakuru Level Five Hospital.
3. To determine the nutritional status of adult patients admitted for a minimum of one week at Nakuru Level Five Hospital.
4. To establish the relationship between nutrition care, food service quality and nutrition status at Nakuru Level Five Hospital.



**A. Interviewee/ Demographic Information**

This section describes the general participants' demographics. Complete the following questions by circling the correct response and writing the appropriate response or code in the last column.

Interviewee Information (to be filled in by interviewer)									
1.	Gender of the interviewee <input type="checkbox"/> Male <input type="checkbox"/> Female								
2.	Date of birth (dd/mm/yyyy) <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>d</td><td>d</td><td>m</td><td>m</td><td>y</td><td>y</td><td>y</td><td>y</td> </tr> </table> <input type="checkbox"/> Unknown	d	d	m	m	y	y	y	y
d	d	m	m	y	y	y	y		
3.	Interviewee's age in years <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td></td><td></td> </tr> </table> years <input type="checkbox"/> Unknown								
4.	Marital status <input type="checkbox"/> Single <input type="checkbox"/> Married <input type="checkbox"/> Separated <input type="checkbox"/> Divorced <input type="checkbox"/> Other (Specify) _____								
5.	Date of admission (dd/mm/yyyy) <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>d</td><td>d</td><td>m</td><td>m</td><td>y</td><td>y</td><td>y</td><td>y</td> </tr> </table>	d	d	m	m	y	y	y	y
d	d	m	m	y	y	y	y		
6.	Number of weeks in hospital <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td></td><td></td> </tr> </table> weeks								

**A. Aspects of Subjective Global Assessment and Nutrition Assessment**

Aspects of Subjective Global Assessment and Nutrition Assessment	
7.	Has your weight changed during your stay in hospital? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know
8.	Describe the weight change. (if NO was indicated in Qn 140, tick weight has not changed) <input type="checkbox"/> Weight has not changed <input type="checkbox"/> Weight has increased <input type="checkbox"/> Weight has reduced <input type="checkbox"/> Weight has increased and reduced
9.	How do you describe your appetite since you were admitted in hospital? <input type="checkbox"/> Good <input type="checkbox"/> Normal <input type="checkbox"/> Poor
10.	Clinical impression of the patient <input type="checkbox"/> Thin <input type="checkbox"/> Acceptable weight <input type="checkbox"/> Overweight <input type="checkbox"/> Other specify) _____

Anthropometry					
11. Weight on admission			12.	If taken indicate weight below: ____ . __ __Kg	
13. Weight	Measurer 1	____. ____ Kg	14. Height	Measurer 1	____. ____ cms
	Measurer 2	____. ____ Kg		Measurer 2	____. ____ cms
	Measurer 3	____. ____ Kg		Measurer 3	____. ____ cms
	Average	____. ____ Kg		Average	____. ____ cms
15. BMI	____. __ __				
16. MUAC	Measurer 1	____. __ __cms		Initials	
	Measurer 2	____. __ __cms		Measurer 1	_____
	Measurer 3	____. __ __cms		Measurer 2	_____
	Average	____. __ __cms		Measurer 3	_____
17. Total energy requirement		_____			
18. Total energy consumed					

### B. Socio-economic and household characteristics

Interviewee Information	
19	<p>What is your highest level of education? <b>(tick all that apply)</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Never went to school/ No formal education</li> <li><input type="checkbox"/> Kindergarten</li> <li><input type="checkbox"/> Partial primary</li> <li><input type="checkbox"/> Complete primary</li> <li><input type="checkbox"/> Partial secondary</li> <li><input type="checkbox"/> Complete Secondary</li> <li><input type="checkbox"/> Incomplete College/University/Tertiary</li> <li><input type="checkbox"/> Complete College/University/Tertiary</li> </ul>
20	<p>Do you earn an income?</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Employed full time by someone else</li> <li><input type="checkbox"/> Employed part time by someone else</li> <li><input type="checkbox"/> Works for self</li> <li><input type="checkbox"/> Works casually/irregularly for someone else</li> <li><input type="checkbox"/> No work income</li> <li><input type="checkbox"/> Other (Specify) _____</li> </ul>
21	<p>What is your primary source of income?</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Farmer</li> <li><input type="checkbox"/> Business/trader</li> <li><input type="checkbox"/> Labourer</li> <li><input type="checkbox"/> Domestic work</li> <li><input type="checkbox"/> Other private sector employment</li> <li><input type="checkbox"/> Public sector employment</li> <li><input type="checkbox"/> Retired with pension</li> </ul>

		<input type="checkbox"/> Begging <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> N/A ( <i>no work income</i> )																
22	What is your estimated average income and your household per month? <i>(write 0 if no income)</i>	<table border="1"> <tr> <td>Interviewee</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Whole household</td> <td></td><td></td><td></td><td></td><td></td><td></td><td>on't know <input type="checkbox"/></td> </tr> </table>	Interviewee								Whole household							on't know <input type="checkbox"/>
Interviewee																		
Whole household							on't know <input type="checkbox"/>											
23	How much do you approximately spend on food per week in your HH?	<input type="checkbox"/> 1-499 <input type="checkbox"/> 500-999 <input type="checkbox"/> 1000-1499 <input type="checkbox"/> 1500-1999 <input type="checkbox"/> 2000-2499 <input type="checkbox"/> >2500 <input type="checkbox"/> Don't know																
24	Do you stay in a rental house?	<input type="checkbox"/> Yes <input type="checkbox"/> No																
25	If yes, how much do you pay for rent per month? <i>(indicate NA if not staying in rented house)</i>	<input type="checkbox"/> <3000 <input type="checkbox"/> 3001-5000 <input type="checkbox"/> 5001-10000 <input type="checkbox"/> 10001-15000 <input type="checkbox"/> 15001-20000 <input type="checkbox"/> >20000 <input type="checkbox"/> N/A ( <i>no rent</i> )																

### C. Likert rating scale on hospital food and food services

Satisfaction with hospital food and food services						
	To what extent are you satisfied with;	Very dissatisfied (1)	Dissatisfied (2)	Fairly satisfied (3)	Satisfied (4)	Very satisfied (5)
26	Type of food served					
27	Amount of food					
28	Variety of hospital food					
29	Taste of food served					
30	Appearance of food served					
31	Time of food service					
32	Temperature of food					
33	Overall quality of food served in the hospital					

Satisfaction with hospital food and food services						
	To what extent are you satisfied with;	Very dissatisfied (1)	Dissatisfied (2)	Fairly satisfied (3)	Satisfied (4)	Very satisfied (5)
34	Attitude of hospital staff serving food					
35	Is hospital food taken away before you have eaten enough?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes				
36	Is hospital food taken away late after you have eaten enough?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes				
37	Can you get a drink or snack when you want?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes				

**D. Likert rating scale on patient's satisfaction with hospital nutrition care services**

Satisfaction with hospital nutrition care services						
	To what extent are you satisfied with;	Very dissatisfied (1)	Dissatisfied (2)	Fairly satisfied (3)	Satisfied (4)	Very satisfied (5)
38	Nutritionists welcoming patients on admission					
39	The way nutritionists speak to patient					
40	The way nutritionists listen to patients worries and concerns					
41	The way nutritionists treat patients as individuals					
42	Nutritionists willingness to respond to patients concerns/ requests					
43	Information provided					
44	Patients teaching/nutrition education on management of the patient's condition					
45	Respect for patients' privacy and confidentiality					
46	Alleviation of patients' anxiety and stress					
47	What have you liked about nutrition care you have received?					
48	What recommendations would give to improve the nutrition care?					
49	What are your general perceptions on nutrition care services?	1= Poor 2= Fair 3= Satisfactory 4= Good 5= Excellent <input type="checkbox"/>				

**E. Likert rating scale on patients' experiences and challenges**

<b>Likert scale on patients' experiences and challenges</b>					
	<b>How often do a nutritionist:</b>	<b>Never (1)</b>	<b>Sometimes (2)</b>	<b>Usually (3)</b>	<b>Always (4)</b>
50	Take your weight				
51	Take your weight				
52	Carry out a dietary assessment				
53	Give you feedback on your nutritional status				
54	Give you an explanation on any procedure or intervention				
55	Respond quickly to your concerns on nutrition care				
56	Respond quickly to your concerns on food service				
57	Make sure you had privacy during nutrition counselling and assessment				
58	Ensure that counselling session is conducted in a simple manner				
59	Do follow up on your condition	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes			
60	During this hospital stay, when nutritionists and other health care providers first came to care for you, how often did they introduce themselves?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes			

**F. Likert rating scale on nutrition care services (patients' expectations about nutritionists)**

<b>Satisfaction with hospital nutrition care services (Patients Expectations about nutritionists)</b>						
	<b>To what extent are you satisfied with nutritionists';</b>	<b>Very dissatisfied (1)</b>	<b>Dissatisfied (2)</b>	<b>Fairly satisfied (3)</b>	<b>Satisfied (4)</b>	<b>Very satisfied (5)</b>
61	Kindness					
62	Cheerfulness					
63	Responsiveness					
64	Harshness					
65	Honesty					
66	Empathy					
67	Friendliness					
68	Rudeness					

Satisfaction with hospital nutrition care services (Patients Expectations about nutritionists)						
	To what extent are you satisfied with nutritionists';	Very dissatisfied (1)	Dissatisfied (2)	Fairly satisfied (3)	Satisfied (4)	Very satisfied (5)
69	Politeness					
70	Respectful					
71	Knowledgeable and competent					
72	Meeting patients' needs					
73	Communication with patients about their nursing care					
74	Respect for patients' beliefs and values					
75	Information giving to patients about their medications and treatment					
76	Patient orientation to the ward environment and regulations					

### G. Supplementation of Hospital Food

77	Do you receive food in the hospital from outside?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes
78	What is the major reason for bringing food from outside? <i>(tick all that apply)</i>	<input type="checkbox"/> Do not bring food from outside <input type="checkbox"/> Lack of variety <input type="checkbox"/> Inadequacy of quantity <input type="checkbox"/> Poor taste <input type="checkbox"/> Relatives bringing food <input type="checkbox"/> Need for snacks <input type="checkbox"/> Other (specify) _____
79	Which meals do you mainly supplement? <i>(tick all that apply)</i>	<input type="checkbox"/> Do not supplement <input type="checkbox"/> Breakfast <input type="checkbox"/> Lunch <input type="checkbox"/> Supper <input type="checkbox"/> Snacks <input type="checkbox"/> All the main meals

### H. Food Frequency Intake

Indicate different food types taken, how many times a week and the source of food

Food Frequency Intake			
Cereals, Carbohydrates		If Yes, how many times in a	Sources of Food

	<b>and Starch</b>		<b>week is it consumed?</b>	
80	Ugali (Specify type) _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
81	White bread	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
82	Brown bread	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
83	White rice	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
84	Brown rice	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
85	Commercial breakfast cereals	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
86	Chips	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
87	Buns	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
88	Green bananas	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
89	Maize porridge	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
90	Other (specify) _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
	<b>Roots and Tubers</b>		<b>If Yes, how many times in a week is it consumed?</b>	<b>Sources of food</b>
91	Sweet potatoes	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
92	Arrowroots	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
93	Others (specify) _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
	<b>Dairy foods and products</b>		<b>If Yes, how many times in a week is it consumed?</b>	<b>Sources of food</b>

94	Whole milk	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
95	Low fat milk (<2% fat)	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
96	Fermented milk	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
97	Yogurt (specify if low fat)	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
98	Skimmed milk	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
	<b>Meat, beef and eggs</b>		<b>If Yes, how many times in a week is it consumed?</b>	<b>Sources of food</b>
99	Beef	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
10	Chicken	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
10	Eggs	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
10	Pork	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
10	Processed sausage (Specify type) _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
10	Offal	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
10	Others (specify) _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
	<b>Legumes/pulses and nuts</b>		<b>If Yes, how many times in a week is it consumed?</b>	<b>Sources of food</b>
10	Dry beans	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
10	Kamande (Lentils)	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
10	Others (specify) _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced



	_____			
	<b>Vegetables</b>		<b>If Yes, how many times in a week is it consumed?</b>	<b>Sources of food</b>
10	Kales (sukuma wiki)	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
11	Cabbage	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
11	Tomatoes	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
11	Spinach	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
11	Amaranthus leaves (Terere)	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
11	Others (specify) _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
	<b>Fruits</b>		<b>If Yes, how many times in a week is it consumed?</b>	<b>Sources of food</b>
11	Apples	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
11	Citrus fruits	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
11	Pawpaw	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
11	Mangoes	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
11	Pineapple	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
12	Avocado	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
12	Others (specify) _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
	<b>Sugar alternatives and sweets</b>		<b>If Yes, how many times in a week is it consumed?</b>	<b>Sources of food</b>
	<b>Sugar</b>			

12	Honey	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
12	Cakes	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
12	Others (specify) _____	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	<input type="checkbox"/> Hospital <input type="checkbox"/> Externally sourced
	<b>Beverages and spread</b>		<b>If Yes, how many times in a week is it consumed?</b>	<b>Sources of food</b>
12	Commercial juices	<input type="checkbox"/> Yes <input type="checkbox"/> No		
12	Carbonated drink	<input type="checkbox"/> Yes <input type="checkbox"/> No		
12	Blueband	<input type="checkbox"/> Yes <input type="checkbox"/> No		
12	Others (specify) _____	<input type="checkbox"/> Yes <input type="checkbox"/> No		

## Appendix 8: Key informant interview guide

### QUESTIONNAIRE ON NUTRITION CARE QUALITY AND FOOD SERVICE QUALITY IN NAKURU LEVEL FIVE HOSPITAL QUESTIONNAIRE FOR KEY INFORMANTS

Questionnaire Code No:	
Participant initials	
Occupation	
Date of the interview (dd/mm/yyyy)-	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Hospital Name	
Station	
Start time	<input type="text"/> H <input type="text"/> H <input type="text"/> M <input type="text"/> M
End time	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Name of interviewer (Initials)	
Checked by (Initials)-	

#### Introduction to the participant:

My name is (name). I am a Masters student from University of Nairobi and interested in the assessing the nutritional care and food service quality in Level Five hospitals within Kenya. Therefore, I would like to inquire about the nutritional care you are receiving and quality of food service more specifically within Nakuru Level Five hospital.

It is important for you to understand that your participation in this study is completely voluntary. I would be grateful if you would agree to participate in this study, but do feel free to refuse. If you refuse, there will be no consequence for you and you will receive whatever care and treatment you need at the health facility as usual. If you decline to participate you will not lose any benefit that you are entitled to such as receiving care and support that is provided at the hospital.

If you choose to participate in this study you need to know that you may withdraw from the study at any stage without giving any explanation for your withdrawal. Your answers will be kept confidential. We will NOT provide this information to anyone including after the end of the study. This survey will take about 30 - 45 minutes.

#### Specific Objectives

1. To evaluate perceived quality of nutrition care and food service among hospitalized patients at Nakuru Level Five Hospital.
2. To evaluate perceived quality of nutrition care and food service among healthcare staff at Nakuru Level Five Hospital.
3. To determine the nutritional status of adult patients admitted for a minimum of one week at Nakuru Level Five Hospital.
4. To establish the relationship between nutrition care, food service quality and nutrition status at Nakuru Level Five Hospital.

### I. Demographic Information

Interviewee Information (to be filled in by interviewer)		
129	Gender of the interviewee-	0- Male 1- Female
130	Date of birth ( <i>dd/mm/yyyy</i> )	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> ☒Unknown
131	Interviewee's age in years	<input type="text"/> <input type="text"/> years ☒Unknown
132	Marital status	0- Single    1- Married    2- Separated 0- Divorced    99- Other (Specify) _____
133	What is the highest level of education you have completed in nutrition or dietetics?	0- Diploma 1- Bachelor's degree 2- Master's degree 3- Doctoral degree 4- Other level of education (please specify) _____
13	What year did you complete your training to be able to practice as a dietitian?	
135	Are you registered by any professional body?	0- Yes 1- No
136	If yes, which one?	

### J. Hospital characteristics /Information

This section describes the general Hospital characteristics /Information.

Hospital characteristics /Information		
137.	Number of beds	
138.	Rate of bed occupation (%)	
139.	Juridical nature	

### K. Structure of the hospital nutrition unit/ department

Structure of the hospital nutrition unit/ department		
140.	How many employees work in the Nutrition Department?	
141.	What is the role of hospital administration in patient nutrition care?	
142.	Do the hospital nutrition unit/ department provide meals for the hospital employees?	0- Yes 1- No

143.	Is there a computer in the department?	0- Yes 1-No
144.	If yes, for what activities is it used?	0- Recording patient information 1- Writing official communication (Emails, memos, Letters) 2- For research 99- Other (Specify)_____
145.	Is there Internet connection?	0- Yes 1-No
146.	Are there Information Education Communication (IEC) materials including food models in the department?	0- Yes 1- No
147.	If yes, what are they used for?	0- Patient counselling 1- Nutrition education 2- Demonstration 3- For display/ decoration 99- Others (Specify)
148.	How many units/offices are allocated to the nutrition department?	

**L. Work Data**

Work Data		
149.	How many nutritionists/ dietitians work in the hospital?	<input type="checkbox"/> In the out-patient Clinic _____ <input type="checkbox"/> In Meal Production _____ <input type="checkbox"/> In Management _____ <input type="checkbox"/> In the wards _____ <input type="checkbox"/> Others _____ <input type="checkbox"/> Total _____
150.	Number of work hours by professional activities by area per day?	<input type="checkbox"/> Clinic Dietician/ Nutritionist _____ <input checked="" type="checkbox"/> Chief Nutritionist/Dietician _____
151.	Is there a shift system for weekends and holidays?	0- Yes 1- No

**M. Activities of dieticians in hospital units (clinics and wards)**

Activities of dieticians in hospital units (clinics and wards)			
152. Are the patients submitted to nutritional assessments (NA)?	<input type="checkbox"/> Yes <input type="checkbox"/> No	153. If yes which methods are used for NA? -	<input type="checkbox"/> Biochemical tests <input type="checkbox"/> Anthropometric measurements <input type="checkbox"/> Clinical assessments <input type="checkbox"/> Dietary assessments <input type="checkbox"/> All <input type="checkbox"/> Other _____ <input type="checkbox"/>

154. Which Biochemical tests are done? -	<input type="checkbox"/> Blood Sugar <input type="checkbox"/> HB <input type="checkbox"/> LFTs <input type="checkbox"/> KFTs <input type="checkbox"/> Urinalysis <input type="checkbox"/> All <input type="checkbox"/> Other _____	155. Which anthropometric measurements are done? -	<input type="checkbox"/> Weight measurement <input type="checkbox"/> Height measurement <input type="checkbox"/> MUAC <input type="checkbox"/> Waist-Hip Ratio <input type="checkbox"/> Skin- Fold thickness <input type="checkbox"/> All <input type="checkbox"/> Other _____
156. Which clinical assessments are done?	<input type="checkbox"/> Vitals (BP, Temp) <input type="checkbox"/> Hair (Brittle) <input type="checkbox"/> Wasting <input type="checkbox"/> Pallor of Eyes, Nails and palms <input type="checkbox"/> Tongue <input type="checkbox"/> Lips <input type="checkbox"/> Presence of oedema <input type="checkbox"/> Dehydration <input type="checkbox"/> All	157. Which Dietary assessments are done? -	<input type="checkbox"/> 24-hr recall <input type="checkbox"/> Dietary history <input type="checkbox"/> Use of food FFQ <input type="checkbox"/> All above methods <input type="checkbox"/> Other _____ <input type="checkbox"/>
158. What other assessments are done? (Specify)			
159. Who requests these tests?			
160. Which patients are evaluated?			
161. List the equipment for anthropometric measurements available at the hospital			
162. When is the patient subjected to nutritional evaluation?			
163. In your dietetic/ nutrition practice, do you use the NCP structure (process)? -	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/>
164. If yes, how often do you use the <b>NCP structure (process)</b> in your dietetic practice?			
165. Is nutrition information recorded in the medical records of the patient in some way?	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/>
166. If yes, what type of recording is performed?			
167. How often is it recorded?			
168. Does the nutrition department have a specific form attached to	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/>

the medical records?		
169.If yes, which is it?		
170.Do the nutritionist/ dietician accompany the distribution of meals in the ward?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
171.If yes, how often?		
172.Does the nutritionist/dietician routinely visit patients?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
173.If yes, how often? (per day)		
174.If yes in which situations?		
175.Does the nutritionist/dietician provide instructions at discharge?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
176.If yes, for which types of patients?	<input type="checkbox"/> Those who require special nutrition attention <input type="checkbox"/> To Come Again (TCA) Patients <input type="checkbox"/> Patients who need referral to out-patient <input type="checkbox"/> All cases <input type="checkbox"/> Others (Specify)_____	<input type="checkbox"/>
177.Is there some situation in which the dietician comments about dietetic intervention in the medical records?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
178.If yes, in which situations does this occur?		
179.Does the dietician follow any protocol and guidelines in the management of patients?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
180.If yes, which protocols and guidelines?		
181.In which situations does the dietitian contact the nursing staff?		
182.In which situations does the dietitian contact the doctors?		
183.Do other medical professionals consult on nutrition or management of a patient??	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
184.If yes, the request is:	<input type="checkbox"/> formal and written <input type="checkbox"/> informal (verbal)	<input type="checkbox"/>

185.If yes, how many nutrition consultations are requested per week on average?		
186.If yes, what are the most frequent situations for which this request is made?		
187.Is there autonomy in staff making decisions?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
188.If No, in what situations do you find this lacking?		
189.Does the nutritionist/ dietitian participate in the clinical visit with other professionals in the ward?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
190.If yes, how often?		
191.Does the nutritionist/ dietitian regularly participate in some type of activity involving professionals outside the nutrition department, such as classes, seminars, campaigns, among others?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
192.If yes, how often?	<input type="checkbox"/> Never <input type="checkbox"/> Sometimes <input type="checkbox"/> Usually <input type="checkbox"/> Always <input type="checkbox"/> others (specify)_____	<input type="checkbox"/>
193.What type of activity are they?		
194.Does the hospital nutrition unit/department conduct any type of formal evaluation of user's satisfaction?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
195.If yes, what are the main points taken into consideration?		
196.If yes, who conducts the evaluation?		
197.Does the hospital have a nutritional support team?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
198.If yes, who are the participants?		
199.What are their responsibilities?		
200.Who is involved in patient nutrition care?		
201.Does the department receive interns?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
202.If yes, How Often?		



203. If yes, are they accompanied by a nutritionist when performing their tasks?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/>
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**N. Activities of dietician in the management of food service**

Activities of dietician in the management of food service		
204.	Does the Hospital Nutrition Unit/Department have budget autonomy?	<input type="checkbox"/> Yes <input type="checkbox"/> No
205.	If yes, who is involved in budgeting for patient meals?	
206.	Is there control of cost/meal or cost/day by the Hospital Nutrition Unit/Department?	<input type="checkbox"/> Yes <input type="checkbox"/> No
207.	Who is responsible for purchases?	
208.	Does the Hospital Nutrition Unit/Department keep statistical records?	<input type="checkbox"/> Yes <input type="checkbox"/> No
209.	If yes, what type of data is systematized?	
210.	Who prepares the menu?	
211.	Is there a standard recipe book for normal diets?	<input type="checkbox"/> Yes <input type="checkbox"/> No
212.	If yes, is it being currently used?	<input type="checkbox"/> Yes <input type="checkbox"/> No
213.	Is there a standard recipe book for special diets?	<input type="checkbox"/> Yes <input type="checkbox"/> No
214.	If yes, is it being currently used?	<input type="checkbox"/> Yes <input type="checkbox"/> No
215.	Is there a special kitchen or area for the preparation of special diets or foods in your institution?	<input type="checkbox"/> Yes <input type="checkbox"/> No
216.	Is there tasting of the preparations?	<input type="checkbox"/> Yes <input type="checkbox"/> No
217.	If yes, who tastes them?	
218.	Does the Hospital Nutrition Unit/Department have any record of the routines (attributions) and regulations with the description of staff roles?	<input type="checkbox"/> Yes <input type="checkbox"/> No
219.	How often are the activities of the staff revised/re-evaluated?	
220.	Is there any type of formal staff evaluation?	<input type="checkbox"/> Yes <input type="checkbox"/> No
221.	If yes, is there a specific instrument for formal staff evaluation?	<input type="checkbox"/> Yes <input type="checkbox"/> No
222.	Does the service have a practice manual?	<input type="checkbox"/> Yes <input type="checkbox"/> No
223.	If yes, is it being currently used?	<input type="checkbox"/> Yes <input type="checkbox"/> No
224.	Does the Hospital Nutrition Unit/Department formulate regular action plans using information produced by the service itself?	<input type="checkbox"/> Yes <input type="checkbox"/> No

		<input type="checkbox"/> Don't know
225.	If yes, is there any written record?	<input type="checkbox"/> Yes <input type="checkbox"/> No
226.	If yes, is any action plan report produced upon request of the hospital administration?	<input type="checkbox"/> Yes <input type="checkbox"/> No
227.	Does the Hospital Nutrition Unit/Department participate in any administrative organs to set its own goals?	<input type="checkbox"/> Yes <input type="checkbox"/> No

### O. Hospital diet characteristics

<b>Hospital diet characteristics</b>		
278.	Does this institution have its own diet manual?	<input type="checkbox"/> Yes <input type="checkbox"/> No
226.	If yes, is it printed?	<input type="checkbox"/> Yes <input type="checkbox"/> No
227.	How many meals are served per day?	
228.	Is it possible to obtain information about the energy supplied by each type of diet?	<input type="checkbox"/> Yes <input type="checkbox"/> No
229.	Is the standardized diet printed as a manual available for consultation?	<input type="checkbox"/> Yes <input type="checkbox"/> No
230.	Are there prescribed diets provided?	<input type="checkbox"/> Yes <input type="checkbox"/> No
231.	If yes, what are the most frequently prescribed diets?	
232.	Is there any statistical control of the prescribed diets?	<input type="checkbox"/> Yes <input type="checkbox"/> No
233.	Are there requests of nutritional supplements for patients?	<input type="checkbox"/> Yes <input type="checkbox"/> No
234.	Do you use industrialized nutritional supplements?	<input type="checkbox"/> Yes <input type="checkbox"/> No
235.	Does the Hospital Nutrition unit/department follow a procedure for nutritional supplementation?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Don't know
236.	If yes, what are they?	
237.	Is there a mechanism through which patients can request diet modification?	<input type="checkbox"/> Yes <input type="checkbox"/> No

238.	If yes, what mechanism is used?	<input type="checkbox"/> Suggestion box <input type="checkbox"/> Verbal <input type="checkbox"/> Formal/written <input type="checkbox"/> Other (Specify)_ _____ _____
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**P. Likert rating scale on Nutritionist satisfaction with hospital food and food services**

Satisfaction with hospital food and food services						
	To what extent are you satisfied with;	Very dissatisfied (1)	Dissatisfied (2)	Fairly satisfied (3)	Satisfied (4)	Very satisfied (5)
77.	Type of food served					
78.	Amount of food					
79.	Variety of hospital food					
80.	Taste of food served					
81.	Appearance of food served					
82.	Time of food service					
83.	Temperature of food					
84.	Overall quality of food served in the hospital					
85.	Attitude of hospital staff serving food					
86.	Is hospital food taken away from patients before they have eaten enough?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes				

Satisfaction with hospital food and food services						
	To what extent are you satisfied with;	Very dissatisfied (1)	Dissatisfied (2)	Fairly satisfied (3)	Satisfied (4)	Very satisfied (5)
87.	Is hospital food taken away from patients late after they have eaten enough?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes				
88.	Do patients get a drink or snack when they want?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes				
89.	Do patients receive food in the hospital from outside?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes				
90.	What is the major reason for bringing food from outside? <i>(tick all that apply)</i>	<input type="checkbox"/> Do not bring food from outside <input type="checkbox"/> Lack of variety <input type="checkbox"/> Inadequacy of quantity <input type="checkbox"/> Poor taste <input type="checkbox"/> Relatives bringing food <input type="checkbox"/> Need for snacks				
91.	Which meals are mainly supplemented? <i>(tick all that apply)</i>	<input type="checkbox"/> Do not supplement <input type="checkbox"/> Breakfast <input type="checkbox"/> Lunch <input type="checkbox"/> Supper <input type="checkbox"/> All the main meals				
92.	In case a patient is not at the ward during meal time (undergoing a test or procedure), is food given to him/ her later	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes				
93.	What are the perceived challenges in ensuring the quality of food service for the patient?					
94.	Are there mechanisms in place to address such challenges?	<input type="checkbox"/> Yes <input type="checkbox"/> No				
95.	If yes, what mechanisms are in place					
96.	What recommendations would you give to improve food service quality?					

<b>Satisfaction with hospital food and food services</b>						
	<b>To what extent are you satisfied with;</b>	<b>Very dissatisfied (1)</b>	<b>Dissatisfied (2)</b>	<b>Fairly satisfied (3)</b>	<b>Satisfied (4)</b>	<b>Very satisfied (5)</b>
97.	What is your general perception about the food service quality that is provided in this hospital?	1= Poor 2= Fair 3= Satisfactory 4= Good 5= Excellent <input type="text"/>				

**Q. Likert rating scale on Nutritionist satisfaction with hospital nutrition care services**

<b>Satisfaction with hospital nutrition care services</b>						
	<b>To what extent are you satisfied with;</b>	<b>Very dissatisfied (1)</b>	<b>Dissatisfied (2)</b>	<b>Fairly satisfied (3)</b>	<b>Satisfied (4)</b>	<b>Very satisfied (5)</b>
98.	Nutritionists welcoming patients at first time contact					
99.	The way nutritionists speak to patients					
100.	The way nutritionists listen to patients worries and concerns					
101.	The way nutritionists treat patients as individuals					
102.	Nutritionists willingness to respond to patients concerns/ requests					
103.	Information provided					
104.	Patients teaching/nutrition education on management of the patient's condition					

<b>Satisfaction with hospital nutrition care services</b>						
	<b>To what extent are you satisfied with;</b>	<b>Very dissatisfied (1)</b>	<b>Dissatisfied (2)</b>	<b>Fairly satisfied (3)</b>	<b>Satisfied (4)</b>	<b>Very satisfied (5)</b>
105.	Respect for patients' privacy and confidentiality					
106.	Alleviation of patients' anxiety and stress					

**R. Likert rating scale on Nutritionist satisfaction with hospital nutrition care services**

<b>Satisfaction with hospital nutrition care services</b>						
	<b>To what extent are you satisfied with;</b>	<b>Very dissatisfied (1)</b>	<b>Dissatisfied (2)</b>	<b>Fairly satisfied (3)</b>	<b>Satisfied (4)</b>	<b>Very satisfied (5)</b>
107.	Hospital administration willingness to address nutrition queries, concerns, worries or complains					
108.	Hospital Nutrition department willingness to address nutrition queries, concerns, worries or complains					
109.	Cost of nutrition services for patients					
110.	Structure of hospital nutrition unit/department					
111.	Number of nutritionist employed					
112.	Number of work hours					
113.	Nutrition guidelines or protocols provided					
114.	Type of evaluation done for user satisfaction					
115.	Facilities to ensure good provision of nutrition services					

Satisfaction with hospital nutrition care services						
	To what extent are you satisfied with;	Very dissatisfied (1)	Dissatisfied (2)	Fairly satisfied (3)	Satisfied (4)	Very satisfied (5)
116.	Nutrition assessment tools/ equipment for nutrition evaluation					
117.	Nutrition information provided for patients					
118.	IEC materials (Nutrition aids) used for nutrition education					
119.	Patients' privacy during counselling					
120.	Type of recording done for patients' information					
121.	The way other medical staffs treat patients					
122.	Provision of nutrition services/ care by nutrition interns					
123.	Nutrition interventions provided					
124.	Type of nutritional supplements provided for patients with specific nutrition intervention					
125.	Hospital follow-up programme for each patient					
126.	Other nutrition related activities (seminars, nutrition campaigns etc) outside the hospital					
127.	What are the perceived challenges in patient nutrition care?					
128.	Are there mechanisms in place to address such challenges?	<input type="checkbox"/> Yes <input type="checkbox"/> No				
129.	If yes, what mechanisms are in place?					
130.	What recommendations would you give to improve the nutrition care?					

Satisfaction with hospital nutrition care services						
	To what extent are you satisfied with;	Very dissatisfied (1)	Dissatisfied (2)	Fairly satisfied (3)	Satisfied (4)	Very satisfied (5)
131.	What is your general perception about the nutrition care quality that is provided in this hospital?	1= Poor 2= Fair 3= Satisfactory 4= Good 5= Excellent <input type="checkbox"/>				

**S. Likert rating scale on Nutritionist practices, Experiences and Challenges**

Likert rating scale on nutritionist practices, experiences and challenges					
	How often do you as a nutritionist:	Never (1)	Sometimes (2)	Usually (3)	Always (4)
132.	Take weight for patients				
133.	Do clinical assessments				
134.	Carry out dietary assessments				
135.	Give feedback on patients' nutritional status				
136.	Give an explanation on any procedure or intervention				
137.	Provide the correct and viable intervention for a particular diagnosis				
138.	Respond quickly to patients concerns on nutrition care				
139.	Respond quickly to patients concerns on food service				
140.	Ensure patients' privacy during nutrition counselling and assessment				
141.	Ensure confidentiality with patients' information				
142.	Ensure that counselling session is conducted in a simple manner				
143.	Follow up on a patients' condition on admission				



144.	Follow up on a patients' condition during hospitalization				
145.	Follow up on a patients' condition after discharge				
146.	How often do you as nutritionist introduce yourself on first time contact with patients? -				
147.	What are the experiences you have encountered in the course of providing nutrition care?				
148.	What are the challenges that you have encountered in the course of providing nutrition care?				

**T. Attitude of Nutritionist on hospital nutrition care services**

Tick the box under the opinion that most closely represents the interviewee

<b>Attitude of Nutritionist in prioritizing hospital nutrition care services</b>							
		<b>Strongly disagree (1)</b>	<b>Disagree (2)</b>	<b>Slightly Disagree (3)</b>	<b>Slightly Agree (4)</b>	<b>Agree (5)</b>	<b>Strongly Agree (6)</b>
149.	Nutritionists are capable of identifying correctly a patient's nutrition needs						
150.	Nutritionists cannot prescribe or carry out routine nutrition care for patients without permission from a doctor						
151.	The length of time taken to care for a patient is vitally important						
152.	Nutritionists should not give patients honest answers about their condition						
153.	Specialized nutrition care does not play a big role in the health management of the patient						

**Attitude of Nutritionist in prioritizing hospital nutrition care services**

		<b>Strongly disagree (1)</b>	<b>Disagree (2)</b>	<b>Slightly Disagree (3)</b>	<b>Slightly Agree (4)</b>	<b>Agree (5)</b>	<b>Strongly Agree (6)</b>
154.	The focus of nutrition care should be adapted when death becomes imminent						
155.	When a patient has been identified as dying a 'specialized nutrition care' should be stopped						
156.	Nutritionists play a key role in helping patients recover from their conditions						
157.	Medical care for the patient should not replace routine nutrition care and practice						
158.	I would not like to care for a critically ill patient.						
159.	Proper nutrition care will enhance the patient's quality of life						
160.	Nutrition support teams are never necessary to deal with complicated nutrition cases						
161.	Multi-disciplinary teams are never necessary to deal with complicated nutrition cases						
162.	A nutritionist plays an important role in the diagnosis of a patient's condition						
163.	Nutrition guidelines and protocols are necessary in nutrition management.						
164.	Use of nutrition Information Education						

Attitude of Nutritionist in prioritizing hospital nutrition care services							
		Strongly disagree (1)	Disagree (2)	Slightly Disagree (3)	Slightly Agree (4)	Agree (5)	Strongly Agree (6)
	and Communication materials are necessary in the provision of optimal nutrition care						
165.	Patients meals should be individualized to the patients' needs						
166.	A nutritionist should be present during food service (from production to actual food service)						
167.	Nutritionist should occasionally participate in nutrition related activities outside normal hospital routines						
168.	There are benefits to implementing the Nutrition care process						
169.	The Nutrition care process facilitate communication between dietitians and other health-care professionals						
170.	The Nutrition care process improve patient/client nutrition care						
171.	The Nutrition care process encourage critical thinking among dietitians						
172.	The Nutrition care process facilitate more patient/client involvement in the care process						

**U. Knowledge of Nutritionist on hospital nutrition care services**

Tick the box under the opinion that most closely represents the interviewee

**Knowledge of Nutritionist in prioritizing hospital nutrition care services**

		<b>Yes (1)</b>	<b>No (2)</b>	<b>Sometimes (3)</b>
173.	The decision that a patient should receive specialized nutrition care should be made by a multidisciplinary team			
174.	There is need for a nutritionist to be involved with every medical case			
175.	The patient should not be allowed to make decisions about his/her general nutrition care			
176.	Nutrition intervention should be continued even when the patient's condition is stable			
177.	Routine nutrition care should not take precedence over other form of care for the patient			
178.	Frequent monitoring of the patients' nutritional status is not always desirable			
179.	When a patient is assessed and found to be deteriorating, the current regimen should be reassessed and discontinued			
180.	Supplementation is appropriate for a critically ill patient			
181.	All critically ill patients are at high risk of nutrition deficiencies			
182.	Malnutrition is common among patients with long hospital stays			
183.	Continuous monitoring and follow-up of a patient upon admission, during hospital			

<b>Knowledge of Nutritionist in prioritizing hospital nutrition care services</b>				
		<b>Yes (1)</b>	<b>No (2)</b>	<b>Sometimes (3)</b>
	stay and after discharge is important			
184.	A patient should not be coaxed to eat			
185.	Nutrition guidelines and protocols are necessary in nutrition management			
186.	It is necessary to use nutrition Information Education and Communication materials in the provision of optimal nutrition care			
187.	Patients meals should be individualized to the patients' needs			
188.	Nutritionist should occasionally participate in nutrition related activities outside normal hospital routines			
189.	A nutritionist should be present during food service (from production to actual food service)			

## **V. Experience of Nutritionist on hospital nutrition care services**

Tick the box under the opinion that most closely represents the interviewee

<b>Experience of Nutritionist in prioritizing hospital nutrition care services</b>							
		<b>Never (0)</b>	<b>1-5 times (1)</b>	<b>5-10 times (2)</b>	<b>10-15 times (3)</b>	<b>15-20 times (4)</b>	<b>&gt;20 times (5)</b>
190.	I have been present as a nutritionist when a patient requires specialized nutrition care						

Experience of Nutritionist in prioritizing hospital nutrition care services							
		Never (0)	1-5 times (1)	5-10 times (2)	10-15 times (3)	15-20 times (4)	>20 times (5)
191.	I have been in charge of nutrition care for a critically ill patient						
192.	I have used the nutrition care process for management of nutrition cases						
193.	I have been part of an multidisciplinary team that identified a patient requiring nutrition support						
194.	I have collaborated with an interdisciplinary team in providing nutrition care for a patient						
195.	I have managed a critically ill patient requiring specialized nutrition care, to recovery						
196.	Please indicate your nutrition experience in years						
197.	Have you received pre-registration education in specialized nutrition care?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes					
198.	Have you received post-registration education in specialized nutrition care?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Sometimes					

## Appendix 9: Training schedule for data enumerators

**TRAINING SCHEDULE FOR RESEARCH ASSISTANTS FOR THE STUDY:  
ASSESSING THE NUTRITION CARE AND FOOD SERVICE QUALITY IN NAKURU  
LEVEL 5 HOSPITAL**

1<sup>st</sup> Day Start Time: 9.00 AM

1<sup>st</sup> Day End Time: 4.30 PM

2<sup>nd</sup> Day Start Time: 9.00 AM

2<sup>nd</sup> Day End Time: 5.00 PM

Start Date: 23<sup>rd</sup> July, 2018

End Date: 24<sup>th</sup> July, 2018

Venue: Tumaini Resort, Nakuru

<b>TRAINING SCHEDULE</b>		
<b>23<sup>rd</sup> JULY, 2018-FIRST DAY OF TRAINING</b>		
<b>S/NO</b>	<b>TIME</b>	<b>Training Program Themes/ Subjects</b>
1	9.00-9.15 AM	<b>Orientation and Instruction</b> Creating rapport Noting down expectations for the training Explaining your expectations to the research assistants
2	9.15- 10.00 AM	<b>Introduction to the Research study</b> Background Information Specific objectives to be met Purpose of the study Benefits of the study
	10.00- 10.45 AM	<b>TEA BREAK</b>
3	10.45- 11.15 AM	<b>General information for the enumerators</b> The job Their responsibility Their place in the research Their relations with the respondents Ethics
4	11.15- 12.00 PM	<b>Objectives and nature of the research/ study</b> What information is to be collected How the research is organized How the information is to be taken How the sample is selected.
5	12.00-1.00 PM	<b>Questionnaire</b> Introduction to the questionnaire and familiarization Explain procedure to be followed when obtaining information Basic interview rules Perusing through the questionnaire Explaining concepts and definitions that are used
	1.00-2.00 PM	<b>LUNCH</b>
6	2.00- 3.00 PM	<b>Consent Form</b> Introduction to the consent form and familiarization

		<p>Explain procedure to be followed when explaining the information in the consent form</p> <p>Perusing through the consent form</p> <p>Explaining concepts and definitions that are used</p>
7	3.00- 4.00 PM	<p><b>Data collection tools and equipment</b></p> <p>Familiarization with measuring tools and equipment</p> <p>Rules applying when taking measurements</p> <p>Actual taking of measurements and recording. Should be repeated severally</p>
<b>24<sup>th</sup> JULY, 2018- SECOND DAY OF TRAINING AND PRE-TESTING</b>		
8	9.00- 11.00 AM	<p><b>Practical Work</b></p> <p>Pairing for the role-play exercise among the enumerators</p> <p>Administering the consent form</p> <p>Completion of questionnaires by the enumerators</p> <p>Actual taking of measurements and recording in the questionnaire.</p> <p>Data cleaning</p> <p>Discussion of filled-in questionnaires</p> <p>Clarification, addition, omission and modification of questions and instructions</p>
9	11.00- 11.30 AM	<p><b>Administrative instructions for enumerators</b></p> <p>Appointing a team lead</p> <p>Distribution of work among the enumerators</p> <p>Person to report to</p> <p>Hours of work; Number of days to conduct research</p> <p>Target sample per day</p> <p>Absenteeism</p> <p>Allowances that would be paid and conditions attached to payment</p> <p>Enumerator requirements on administrative matters</p> <p>Required records on time and attendance</p> <p>Forms to be filled on completion of work.</p>
10	12.00- 5.00 PM	<p><b>Pre- Testing</b></p> <p>Selection of sample of 10 adult surgical and medical patients with similar inclusion and exclusion criteria to that of the main study.</p> <p>Pre-test participants; not to be included in the main study. Procedures employed in pre-testing the instruments should be identical to those used in the main study.</p> <p>Administering the consent form</p> <p>Completion of questionnaires by the enumerators</p> <p>Actual taking of measurements and recording in the questionnaire.</p> <p>Data cleaning</p> <p>Discussion of filled-in questionnaires</p> <p>Editing; Clarification, addition, omission and modification of questions and instructions</p>