

**ASPECTS OF NUTRITIONAL KNOWLEDGE,
ATTITUDES AND PRACTICES OF NURSES
WORKING IN THE SURGICAL DIVISION AT THE
KENYATTA NATIONAL HOSPITAL, KENYA.**

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Master of Nutrition

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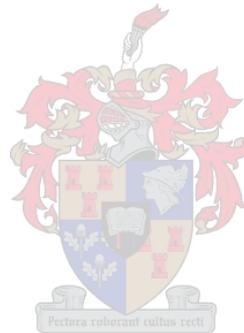
DECLARATION OF AUTHENTICITY

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and that I have not previously, in its entirety or in part, submitted it at any university for a degree.

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ABSTRACT

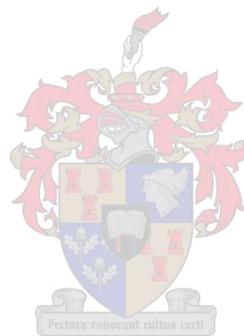
INTRODUCTION: Adequate nutrition is required for patients to improve and maintain their health. Nurses are in one of the best positions to ensure adequate nutrition because of their holistic caring role. The aim of the study was to determine aspects of the current nutritional knowledge, attitudes and practices of registered nurses towards nutritional management of patients.

RESEARCH METHODS: This was a descriptive and observational study. One hundred and one out of 160 Kenyan registered nurses working at the surgical division at Kenyatta National Hospital in Nairobi, Kenya successfully completed the study representing a 63% response rate. The 47-item validated questionnaire consisted of 9 socio-demographic questions, 13 questions on nutrition knowledge, 13 questions on attitude and 12 questions on nurses' practices.

RESULTS: The general performance of the registered nurses on the selected aspects of knowledge, attitudes and practices was overall poor. They contradicted themselves on their beliefs in relation to their practices. They did not know their primary role in nutrition care, neither did they know the role played by dietitians/nutritionists and doctors. Twenty-six percent of the registered nurses strongly agreed that it was the nurses' responsibility to assess the nutritional status of patients compared to 72% who strongly agreed it was the dietitians'/nutritionists' responsibility and 24% who strongly agreed it was the doctors' responsibility. Eighty-two percent reported that they would refer patients to a dietitian/nutritionist, 18% that they would discuss diet options with the patients, while none of the registered nurses would consult the doctor if they felt that the patient was not receiving adequate nutrition. Seventy-five percent of them suggested that nutritional care of patients could be improved by adopting a multidisciplinary approach and 18% by catering staff feeding the patients. Only 28% reported that nutritional issues were included in ward rounds. Although 72% of the registered nurses reported that it was important to weigh patients on admission, only 43% reported actually weighing patients, of which 59% weighed patients for medication purposes and only 18% weighed patients for nutritional status assessment. The overall nutritional knowledge score was graded as

average (57%). The poorest scores were noted for knowledge on clinical nutrition questions (14%) and the highest scores for knowledge on basic nutrition questions (91%).

CONCLUSION: Although the nurses regarded nutritional care of patients as important, their practices seemed to contradict their attitudes. Considering the responsibility the nurses are entrusted with regarding patient nutritional care, their current knowledge, attitudes and practices towards nutritional care is a cause for concern. The results of this study provide a basis for continuous nutrition education, well-designed protocols for nutritional status assessment by registered nurses and efforts directed towards improved clinical practice.



OPSOMMING

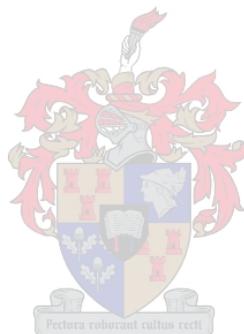
INLEIDING: Voldoende voeding is nodig vir pasiënte om hul gesondheid te behou en bevorder. Verpleegkundiges is in een van die beste posisies om goeie voeding te verseker as gevolg van hul holistiese versorgende rol. Die doel van die studie was om aspekte van die huidige voeding kennis, houding en gedrag van geregistreerde verpleegkundiges ten opsigte van voeding behandeling van pasiënte te bepaal.

NAVORSINGSMETODIEK: Hierdie was 'n beskrywende waarnemende studie. Een honderd en een van die 160 Keniaanse geregistreerde verpleegkundiges wat in die chirurgiese afdeling van Kenyatta Nasionale Hospitaal in Nairobi, Kenya werksaam is het die studie suksesvol voltooi met 'n reaksiekoers van 63%. Die 47-item geldige vraelys het 9 demografiese vrae, 13 voeding kennis vrae, 13 kennis vrae en 12 vrae ten opsigte van verpleegkundiges se gedrag, ingesluit.

RESULTATE: Die algemene prestasie van die geregistreerde verpleegkundiges ten opsigte van geselekteerde aspekte van kennis, houding en gedrag was oor die algemeen swak. Hulle het hulself ook weerspreek ten opsigte van hul menings en gedrag. Hulle het nie hul primêre rol in voedingsorg geken nie en het ook nie geweet wat die rol van dieetkundiges/voedingkundiges en dokters is nie. Ses-en-twintig persent van die geregistreerde verpleegkundiges het sterk saamgestem dat dit die verpleegkundiges se verantwoordelik is om voedingstatus van pasiënte te bepaal in vergelying met die 72% wat sterk saamgestem het dat dit die dieetkundige/voedingkundige se verantwoordelikheid is en 24% wat sterk saamgestem het dat dit die dokter se verantwoordelikheid is. Twee-en-tagtig persent rapporteer dat hulle hul pasiënte na 'n dieetkundige/voedingkundige sal verwys, 18% dat hulle die dieetopsies met die pasiënte self sou bespreek en geen het gerapporteer dat hulle die dokter sou raadpleeg indien hulle voel die pasiënt kry nie voldoende voeding nie. Vyf-en-sewentig persent van die verpleegkundiges stel voor dat voedingsorg van die pasiënte verbeter kan word indien 'n multidisiplinêre benadering geïmplimenter sou word en 18% deurdat die voedseldienspersoneel die pasiënte voed. Net 28% rapporteer dat voedingsprobleme by saalrondes ingesluit word. Alhoewel 72% van die geregistreerde verpleegkundiges gerapporteer het dat dit belangrik is om pasiënte by toelating te weeg het net 43% gerapporteer dat hulle eintlik pasiënte weeg. Van hulle, het 59% die pasiënte net geweeg vir medikasie

doeleindes en net 18% om voedingstatus te bepaal. Die algehele voeding kennis puntetelling was as gemiddeld geklasifiseer (57%). Die swakste punte is vir die kliniese vrae behaal (14%) en die hoogste vir die basiese kennis vrae (91%).

SLOTSOMMING: Alhoewel die geregistreerde verpleekundiges voedingsorg van hul pasiënte belangrik ag is dit asof hul gedrag teenstrydig is met hul menings. As die verantwoordelikheid wat verpleegkundiges het ten opsigte van pasiënte se voedingsorg in ag geneem word, is hul huidige kennis, houding en gedrag 'n bekommernis. Die resultate van hierdie studie kan as 'n basis gebruik word vir voortgesette voedingonderrig asook goed beplande protokolle vir die bepaling van voedingstatus deur geregistreerde verpleegkundiges om kliniese sorg te verbeter.

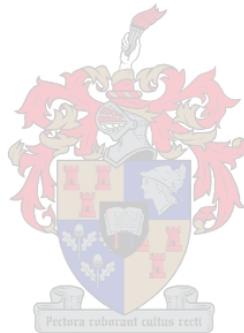


DEDICATION

To my dad Edward Adero Kobe for his love, care and support.

My lovely angel baby Tito Adero Okoth for the short time we spent together you will forever live in my heart. Baby Tasha Yanza for the joy you have brought to my life.

My mother, brothers and sister for always being there for me.



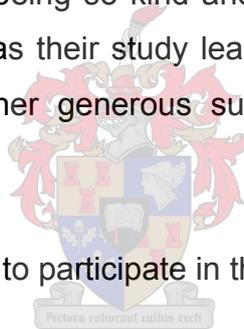
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The researcher is indebted to Fresenius Kabi South Africa (FKSA) for their generous financial support that went towards this study. I will forever be grateful to Ian Ross Marsh, the former Export Director FKSA who approved the sponsorship of this study, and the Fresenius Kabi (FK) top management for not objecting to my request and continuing to support me even after Ian Ross Marsh left the company. Many thanks to Dr Karsten Wellner the General Manager FKSA and Executive Vice President Africa, for his continuous support towards the approval of this study.

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I thank all the nurses who agreed to participate in this study for their cooperation.



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I am very grateful to my fiancé for his constant support, love and understanding.

A special mention to my colleagues for their support as they cannot go unmentioned.

LIST OF ABBREVIATION

MUST	Malnutrition Universal Screening tool
NRS	Nutritional Risk Screening
MNA	Mini Nutritional Assessment
BAPEN	British Association for Parenteral and Enteral Nutrition
PA	Prealbumin
PNI	Prognostic Nutrition Index
NRI	Nutrition Risk Index
SGA	Subjective Global Assessment.
ASPEN	American Society for Parenteral and Enteral Nutrition
BMI	Body Mass Index
EN	Enteral Nutrition
PN	Parenteral Nutrition
KMTC	Kenya Medical Training Center
KRN	Kenya Registered Nurse
KRCHN	Kenya Registered Community Health Nurses
KNH	Kenyatta National Hospital
KAP	Knowledge, Attitudes and Practices
ENT	Ear Nose and Throat
FK	Fresenius Kabi
FKSA	Fresenius Kabi South Africa
MPH	Mbagathi Provincial Hospital
NCK	Nursing Council of Kenya
MAG	Malnutrition Advisory Group
KMTF	Kitchen Made Tube Feed

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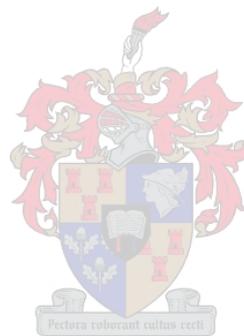
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CHAPTER 1: INTRODUCTION



1.1 INTRODUCTION

In 1859, Florence Nightingale wrote that ‘every careful observer of the sick will agree with this, that thousands of patients are annually starved in the midst of plenty’. Over a century later, it is still common to encounter patients admitted to hospital displaying undiagnosed signs and symptoms of malnutrition¹. The reasons for this are not clear, but contributing factors could include patients’ disease leading to poor appetite and disinterest in food, or disease in conjunction with social segregation, psychological factors, economic status, lack of medical awareness and longer hospitalization with lack of assistance with feeding, especially those patients who are disabled or are too unwell to feed themselves². Poor skills in recognizing malnutrition in patients exists in the healthcare providers¹. In addition, low priority given to patients’ nutrition by doctors and nurses makes it even harder to identify those at risk³.

The impact of malnutrition in surgical patients is often underestimated by surgical nurses, despite the fact that complications seen after surgery may often be linked to patients’ preoperative nutritional status¹. The provision of food and fluids to hospital patients is traditionally a nursing role⁴. However, this has largely been relegated to ancillary staff in recent years. For these reasons nurse’s involvement in patient feeding has been greatly reduced⁴. There is little published information about nurses’ perception of their role in nutrition care and their knowledge of nutrition principles in the developing world. Information available comes mostly from the developed world, emphasizing the need for information regarding nutritional knowledge, attitudes and practices of nurses in Kenya.

1.2 MOTIVATION FOR THE STUDY

Malnutrition is a common problem of hospitalized patients, with a significant effect on health and the economy. Nevertheless, nurses appear to be “nutrition blind” in failing to recognize and treat malnutrition in surgical patients⁵. Tackling this problem may start by identifying subjects at risk and working in preventing the occurrence of malnutrition. Screening for malnutrition should be attempted at all levels and appropriate intervention undertaken as early as possible. Nurses are in the best position to ensure good nutrition because of their holistic caring role but their reduced

involvement in patients' nutritional care is of great concern⁴. Although nurses consider nutritional care to be important many have difficulty in raising its priority above other nursing activities as a result of time constraint and multitasking issues⁶. Without a good nutritional base however, nurses may not provide appropriate nutritional care⁷. It was therefore deemed necessary and appropriate to investigate aspects of nurses' nutritional knowledge, attitudes and practices.

1.3 IMPORTANCE OF NUTRITION IN SURGERY

A person's nutritional requirements increase (Figure 1.1) following trauma or surgery, and in the presence of a chronic wound⁸. It has been estimated that the basal metabolic rate rises by up to 10 per cent following even minor surgery, and can rise by 100 per cent or more in the presence of severe burns⁸. If the increased demand for nutrients is not met, this can have a significant impact on wound healing, but it is nevertheless a factor that is often overlooked by health professionals in their patients' nutritional status assessment⁹.

1.3.1 Macronutrient Requirements

Protein: Adequate protein intake in the postoperative recovery period is of primary therapeutic concern to replace losses and supply increased demands as amino acids are necessary constituents of the proteins involved in the body's defense mechanisms, tissue synthesis, wound healing and bone healing^{8, 10}. Tissue and plasma reserves are imperative to prepare the patient for blood losses during surgery and for tissue breakdown in the immediate post-operative period of catabolism¹⁰. A catabolic period with progressively increasing protein deficiency is common in surgical patients and may lead to a negative nitrogen balance of as much as 20g/day¹⁰. This amount of nitrogen loss represents an actual loss of tissue protein of more than 1 pound/day. Protein loss is critical in post surgical patients who go without food for more than 7 days and stressed post surgical patients who go without food for 3 to 4 days, because the glucose needed for tissues such as brain, spinal cord, bone marrow and immune system can only come from gluconeogenesis, which in turn starts with amino acids⁹. In the case of malnutrition or chronic infection the patient's protein deficit may become even more severe and cause serious complications¹⁰.

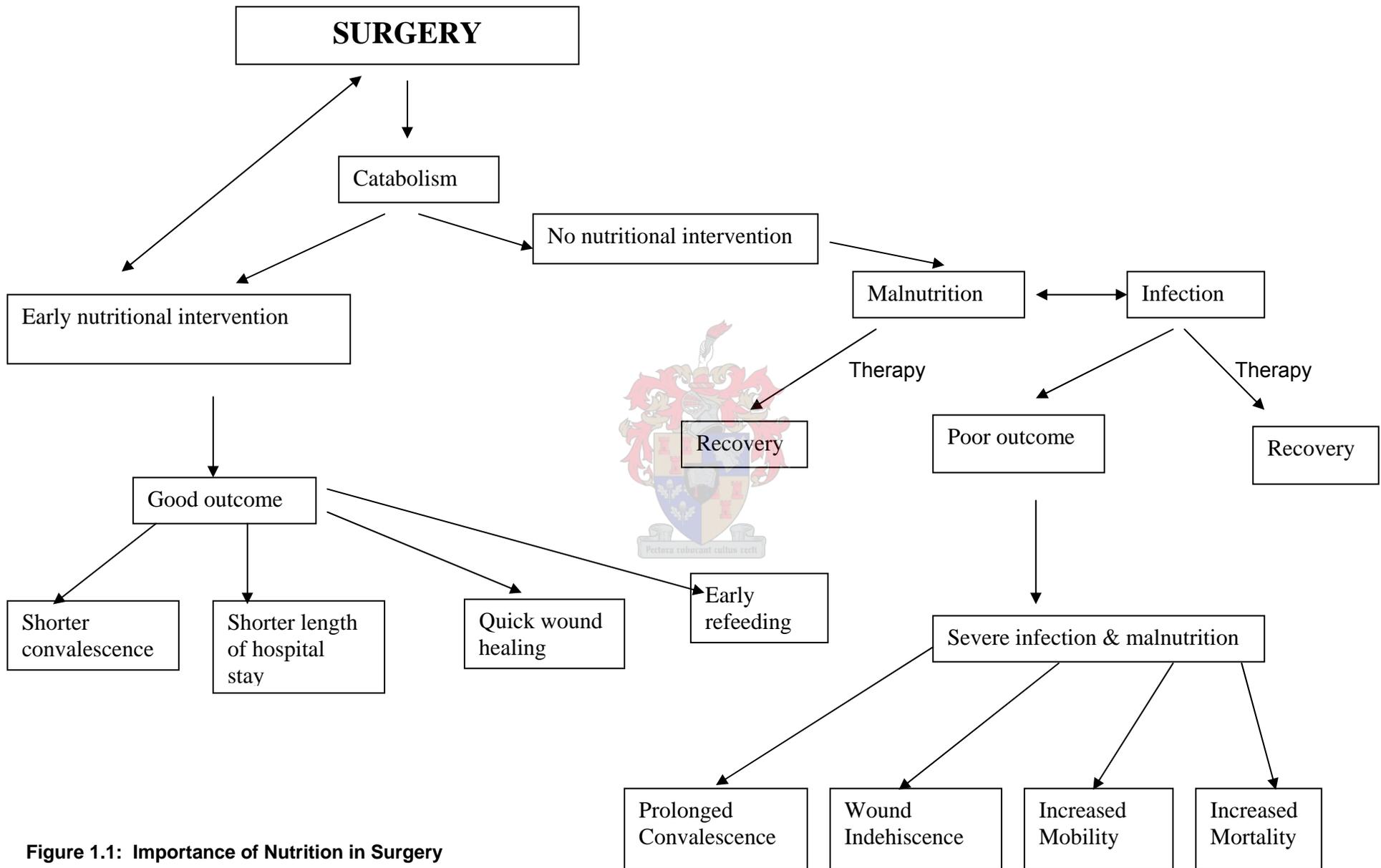


Figure 1.1: Importance of Nutrition in Surgery

Energy: The energy reserves in the body are large. Although the carbohydrates reserves from glycogen and circulating glucose is quite small, about 1000 Kcal, the reserves of protein and fat are much larger. A normal person has the equivalent of 30,000 Kcal of protein and 140,000 kcal of fat. Acute losses of up to 10% are well tolerated⁹. Sufficient non-protein energy must be provided to build up any deficit and to spare protein for tissue synthesis¹⁰. Carbohydrates especially, are needed for glycogen stores and continuing demand that is not met in the diet and should be supplemented or deficiencies may ultimately lead to loss of the body's structural protein¹¹.

Water: Large water losses may occur from vomiting, hemorrhage, exudates, or fever and drainage. Resuscitation therapy is therefore of vital concern after surgery¹⁰.

1.3.2 Micronutrient Requirements

Normal tissue stores of vitamins are needed for the added metabolism of carbohydrates and protein. Vitamins play an important role in the healing process. The most commonly required micronutrients for wound healing are vitamin C and zinc. Vitamin C is particularly important for collagen synthesis. Zinc is required for gene expression and protein synthesis, therefore demand for zinc will be high wherever rapid cell division and protein secretion occur⁹. The healing wound also needs vitamins A and B complex, and the minerals copper, manganese and magnesium¹¹.

Replacing mineral deficiencies and ensuring continued adequacy is essential. In tissue breakdown, potassium and phosphorus are lost. Electrolyte losses, especially sodium and chloride, accompany fluid losses¹⁰. Any deficiency state such as anaemia, which may develop from blood loss or malabsorption of iron should be corrected prior to surgery¹⁰. When anaemia is severe, peripheral circulation is likely to be reduced and oxygen delivery to the tissues and vital organs is impaired⁸.

1.4 NUTRITIONAL STATUS ASSESSMENT

Surgical patients are often malnourished. They are often though misdiagnosed or those at risk not identified because the nursing staff are not trained to look for the signs^{1, 12}. The multiple manifestation of undernutrition emphasizes the importance for the nutritional status assessment encompassing a variety of medical history, dietary history, physical examination, anthropometric measurements and laboratory data¹³. The nutritional status should therefore be assessed at admission, preoperatively and postoperatively as this may lead to more rapid recognition of the role nutrition plays in the individual's healing process. Many of the nutritional status assessment methods may however, be affected by the complex situation prevailing in sickness¹⁴. Hospitals should have a policy and a specific set of protocols for identifying patients at risk, leading to an appropriate nutrition care plan¹⁵.

1.4.1 Biochemical Assessment

A number of serum proteins have been extensively investigated to determine their validity in the assessment of nutritional status. These include serum albumin, transferrin, transthyretin (prealbumin), retinol-binding protein, somatocin C and fibronectin. In hospitalized patients, however, no single marker or group of tests can be recommended to reliably assess nutritional status in surgical patients¹⁶.

Serum albumin levels are often used to assess nutritional status; however, changes in fluid status and distribution can result in apparent rises and falls in the serum level¹⁷ and its relatively long half-life (19-21 days) means that it shows little response to short-term starvation or nutritional support. It is also affected by factors common in a sick population, e.g. renal and hepatic malfunction, and increased demand for acute-phase protein synthesis rather than albumin¹⁴. Other proteins used (e.g. transferrin, transthyretin/prealbumin) may also be affected by stress and disease. Shetty *et al* indicated that prealbumin (PA) levels decrease faster than levels of albumin and transferrin in cases of protein

depletion and returns to normal after nutritional repletion. Due to the unique characteristics and its small pool size (0.01g/kg body weight), PA is a better and more sensitive indicator of acute changes in protein status than albumin in surgical patients¹⁴.

Other biochemical indices have been used to assess nutritional status, such as urinary creatinine to indicate nitrogen balance, although accuracy requires that patients' conditions be relatively stable and all intake and output measured. A number of other methods are available in specialized areas but are not generally accessible to nursing staff⁷.

Immune system function has also been suggested as a method of nutritional status assessment, as well as skin antigen testing and total lymphocyte count. However, these have limitations in ill health as results may be affected by any form of metabolic stress¹⁸.

1.4.2 Anthropometric Assessment

There is currently no anthropometric measurement considered to be completely accurate and practical for use in the clinical setting although recent studies suggest that indices/measurements such as body mass index (BMI) mid-arm muscle circumference and triceps skinfold thickness can be used¹.

If anthropometry is used to define malnutrition, it is recommended that at least three different anthropometric criteria should be observed (e.g. height, weight, mid-arm circumference) in classifying the subject's nutritional status¹. The measurement of height and weight and derivation of BMI often relies on the willingness of the nurse to comply. The lack of compliance may be due to a lack of insight into the need to record such data. It may also be simply that the necessary equipment is not available in clinics or at ward level. Furthermore equipment which is present may not be regularly calibrated or maintained¹⁹. If there are no doctors' orders to measure a patient's height or weight, it is often not done¹⁹. A study conducted by a working party of the British Association for

Parenteral and Enteral Nutrition (BAPEN) on screening by nurses and junior doctors to detect malnutrition when patients are first assessed in hospital, found that most of the nurses and doctors who were asked questions about the height and weight measurements of their patients had failed to measure them because they regarded them as unimportant. Of the wards surveyed, 86% had weighing scales, but only over half the hospital had a service contract for their maintenance¹². The use of body weight alone may be misleading. Use of BMI is therefore suggested. However, there are obvious limitations to this formula, e.g. in thin but well nourished, or oedematous people^{7, 18}. Nurses can assess nutritional status of patients by simply weighing patient's over a period of time. The measurement of height is also influenced by kyphosis, scoliosis, and other spinal conditions. In a few critically ill surgical patients such as those being ventilated, measurements of height as well as weight may not be feasible. An estimate of height can therefore be derived by using the knee height¹⁹.

1.4.3 Dietary Assessment

There are four main methods that can be used in surgical patients (24-h recall, food records (diaries), diet history and food frequency questionnaires) to obtain information regarding eating habits and the amount of food consumed. These methods may however not be practical for the nursing staff. A trained dietician /nutritionist should therefore collect this information²⁰.

1.4.4 Functional Assessment

Functional testing such as grip strength and respiratory muscle strength can be a useful component of nutritional status assessment in surgical patients. Muscle function has correlated with postoperative complications better than other nutritional parameters²⁰. Low grip strength suggests low protein reserves, but it cannot be used in patients with some disabilities e.g. arthritis, critically ill or in patients who have been prescribed muscle relaxants¹⁹. Delayed recovery of grip strength after surgery has been demonstrated as an early indicator of postoperative complications^{1, 19}.

1.4.5 Physical Examination

General observations of the patient can be useful as a preview to objective measurements of the surgical patient. Observations can include brief comments on obesity, body fat distribution, and wasting in terms of fat and lean tissue reserves. Muscle wasting can often be observed in the extremities, temples or interosseous areas²⁰.

Body temperature should be measured. Fever can be one manifestation of metabolic response to injury or illness. Fever raises energy expenditure up to 13% for each 1⁰C elevation, which may affect nutritional support goals. In hospitalized patients, the presence/location of drains, feeding tubes, endotracheal tubes and intravenous lines should be noted because this may influence nutritional support recommendations²⁰.

Physical examination related to hair, skin, mouth and neurologic system should be monitored. History of weight loss, alcohol abuse, restricted dietary habits, may reveal signs of vitamin deficiency²⁰.

1.4.6 Screening for Nutritional Risks

Surgical patients have been studied as a specific group and been identified as at risk of protein-energy malnutrition. Nutritional screening is now common in most clinical areas and many tools have been developed for this purpose¹⁹. Having the nursing staff assist with the screening process upon admission allows a patient who is at nutritional risk to be assessed by a registered dietitian or nutritionist early enough during his/her hospital stay²¹. The screening process may be carried out by the nursing staff using a recognized protocol and may facilitate screening of large numbers of surgical patients¹³. Clinical scores (nutritional indexes and nutritional assessment screening tools) are some of the nutritional status assessment methods that have been used to assess the nutritional status of patients as they are probably more accurate than using a single nutritional parameter¹³.

Some of the indexes that have been used in the assessment of nutritional status of surgical patients are:

Buzby *et al.* combined measurements of serum albumin, serum transferrin, triceps skinfold, and delayed hypersensitivity into the Prognostic Nutritional Index (PNI) to assess the patients' nutritional status. A prospective study done by Buzby *et al.* on 100 preoperative patients clearly demonstrated a relationship between the PNI and the number of patients who developed postoperative complications¹³.

The Nutrition Risk Index (NRI) is based on calculation of the association of various nutritional indexes and postoperative complications using the serum albumin concentration and present weight compared with usual weight. Buzby *et al.* indicated that NRI can be used to measure nutritional status of surgical patients¹³.

Other nutritional indexes that have been used to measure the nutritional status of patients and may be useful in surgical patients are; Maastrich Nutritional Index (MNI), which uses serum albumin, serum transthyretin (prealbumin), the total blood lymphocyte count, and the percentage of ideal weight. The Prognostic Inflammatory and Nutrition Index (PINI) which was developed by Ingelbeck and Carpentier, evaluates nutritional proteins (albumin and prealbumin) as a function of inflammatory proteins (C-reactive protein and α_1 glycoprotein acid)¹³.

In hospitalized patients, the PNI is the only well-validated objective score. However, the NRI and the MNI seem to give similar results as the PNI¹³.

Screening tools that have been used in the assessment of nutritional status of surgical patients are:

The Subjective Global Assessment (SGA), which incorporates functional capacity as an indicator of malnutrition and also relies heavily on physical signs of

malnutrition or malnutrition-inducing conditions¹⁴. It is based on five features of medical history and five features of physical examination performed by a clinician¹³. Baker J *et al* carried out a comparative study of SGA and objective measurements and found that serum albumin, creatinine-height index, percentage of weight loss, total body potassium, and delayed hypersensitivity were significantly lower in the malnourished patients than in the non-malnourished group of patients. The post surgical infectious complications rate was well predicted by the SGA¹³. SGA has been found to be a good predictor of complications in patients undergoing liver transplants¹³ and gastrointestinal surgery¹⁴. However, the sensitivity of SGA is dependent on the physical signs of micronutrient deficiency, which are usually late in the course of the disease. Thus, SGA is probably not useful as a tool for early detection and is not practical to use for follow-up and monitoring during nutritional support¹⁴.

As reported by the Malnutrition Advisory group's (MAG) guidelines for the detection and management of malnutrition 2000, the Malnutrition Universal Screening Tool's (MUST) purpose is to detect undernutrition on the basis of knowledge about the association between impaired nutritional status and impaired function¹⁵. It takes a form of a 5 step flow-chart, collating information on a patient's current BMI, weight loss over the last 3 to 6 months, and the presence of acute disease (which could prevent eating for more than 5 days). MUST's use has been extended to hospitals, where it has been found to have excellent inter-rater reliability, concurrent validity with other tools, and predictive validity (length of hospital stay, mortality in elderly wards, and discharge destination in orthopaedic patients)¹⁵. It has been documented to have a high degree of reliability (low inter-observer variable). Its validity has been assured by involving a multidisciplinary working group in its preparation¹⁵.

The Nutritional Risk Screening's (NRS-2002) purpose is to detect the presence of undernutrition and the risk of developing undernutrition in surgical patients in the hospital setting²². It contains the nutritional components of MUST, and in addition, a grading of severity of disease as a reflection of increased nutritional

requirements. It includes four questions as a pre-screening for departments with few at risk patients. With the prototypes of severity of illness given, it is meant to cover all possible patient categories in a hospital, it also includes old age as a risk factor¹⁵. It has been used by nurses and dietitians in a 2 years implementation study in three hospitals (local, region, and university hospital) in Denmark, where its inter-observer variation reliability was validated²³.

The Mini Nutritional Assessment's (MNA) purpose is to detect the presence of undernutrition and the risk of developing undernutrition amongst the elderly²². The MNA test is composed of 18 items and can be performed in less than 15minutes. It involves a general assessment of health (questions regarding lifestyle, morbidity, and medication), a dietary assessment (questions regarding type and number of meals), anthropometric measurements and a subjective self-assessment by the patient. The result of the MNA test classifies the patient as well nourished, at risk for malnutrition, or malnourished¹⁶. Its content validity has not been reported in surgical patients.

1.5 COMMON NUTRITIONAL PROBLEMS IN SURGICAL PATIENTS

Surgical conditions are influenced by the current nutritional status of a patient either preoperatively or postoperatively. The most common nutritional problem faced by surgical patients is malnutrition^{6, 27-30}.

1.5.1 Hospital Malnutrition

Despite the high prevalence of malnutrition, nurses' awareness of patient's nutritional status seems to be lacking¹⁻². Nurses play a key role in identifying patients who are at risk of malnutrition or need nutritional intervention.

More than 30 years ago, the plight of the malnourished hospitalized patients was highlighted in a publication that has become a classic²⁵. It drew new attention to the relationship between malnutrition and increased morbidity and mortality in

medical and surgical patients with acute or chronic conditions throughout the world²⁶. Studley was one of the first physicians to show that a 20% loss of usual body weight was correlated to a significant increase in mortality rate of patients undergoing surgical treatment of duodenal ulcers²⁷. Patients who were malnourished had an increased mortality rate, length of hospital stay was significantly longer, and a three-fold increase in hospital costs compared to the well nourished counterparts²⁸. Nevertheless, nutritional status of patients is still known to deteriorate during the length of hospital stay^{6, 29-30}. Mc Whirter and Pennington found that 40% of patients were malnourished at the point of entry, and 75% were affected by the time of discharge¹. In Argentina, Debonis *et al* used anthropometric measurements and biochemical assays to assess the nutritional status of surgical patients. They found that 54% of these patients were at risk of malnutrition, 22.3% were moderately malnourished, and 10% were severely malnourished³¹. Another study done by Wyszynski *et al* in a large hospital in the suburbs of Buenos Aires, identified a low prevalence of malnutrition in medical and surgical patients as shown by their weight loss (>10%) in only 12% and body mass index (BMI; <19kg/m²) in 5% of all hospitalized patients³².



Malnutrition among hospitalized patients interferes with recovery. Although nutritional support can partially ameliorate these changes, it is very often either inadequate or not given at all, and leads to iatrogenic malnutrition³³. Dramatic deterioration may occur before physicians and nurses become proactive³⁴. Malnutrition is of great concern and can be reduced by sensitizing nurses with basic knowledge on nutrition practices.

In Kenya, it seems that malnutrition in hospitals is a complex issue that can be attributed to several factors including politics, the economy, diverse cultures and religious practices and lack of relevant knowledge leading to poor nutritional status at the time of admission.

1.6 GENERAL DIETARY MANAGEMENT OF SURGICAL PATIENTS

1.6.1 Oral Feeding

The majority of general surgical patients resume oral feeding as soon as possible to provide adequate nutrition¹⁰. Patients who do not take sufficient food to meet their needs can increase their dietary intake if they are offered appetizing energy dense supplements (in solid or liquid form)³⁶. Surgery involving mouth, throat and neck requires modification in the manner of feeding as patients usually cannot chew or swallow, therefore, concentrated feeding in liquid form must be planned¹⁰.

1.6.2 Enteral Nutrition

Enteral tube feeding is the preferred route for feeding patients with a functioning gastrointestinal tract who cannot be fed orally or who do not obtain adequate nutrition from the intake of food or dietary supplements¹⁰. Enteral feeding is nearer to the physiological norm than parenteral feeding and is better at maintaining integrity of the 'gut barrier'. This prevents bacterial translocation and associated endotoxins from entering the systemic circulation³⁶. Most clinicians feel that enteral nutrition has far fewer complications and side effects than parenteral nutrition⁹.

1.6.3 Parenteral Nutrition

This is usually considered when oral or enteral nutritional support is contraindicated or cannot be achieved adequately³⁶. It provides crucial nutritional support from solutions containing a higher percentage of macronutrients and micronutrients¹⁰. In cases of major surgery, aggressive parenteral nutritional support means is often a primary factor determining the outcome. As far as the impact of nutrition intervention on clinical outcome is concerned, a number of trials have demonstrated the beneficial effect of nutritional support via the parenteral route following bone marrow, liver or renal transplantation³⁷⁻³⁸. Great care has been recommended in selecting the patients

most likely to benefit from such therapy, although nutrition support via the parenteral route is undoubtedly beneficial in reducing septic complications in the severely malnourished patients, such treatment does not improve clinical outcome. There can also be no doubt that parenteral nutrition support administered to severely malnourished patients is associated with a reduction in the rate of postoperative complications⁴⁰.

1.7 KNOWLEDGE, ATTITUDES AND PRACTICES (KAP) OF NURSES

In recent years there has been concern about the lack of nutritional knowledge amongst nurses⁴¹. It has long been recognized that nutrition education in the medical curricula has been haphazard, ambivalent and far from adequate⁴². It is also well known that nutrition training and knowledge amongst health care professionals is poor⁴³. A study done in Lebowa, South Africa showed that nutritional knowledge of clinical nurses was inadequate³⁵. Without a good knowledge base, nurses cannot provide appropriate nutritional care. It is apparent that there has been too little emphasis on clinical nutrition during nurses' training in hospitals in the past^{2-3, 28}. This is especially so in Kenyan hospitals even though there is no documented evidence. Nutrition therefore needs to be an essential component of nursing training, if nurses are to apply nutrition in clinical practice and in the prevention of diseases¹².

Although nurses consider nutritional care to be important, many have difficulty in raising its priority above other nursing activities due to time constraints and multitasking issues⁶. Information relating to nursing activities has tended to focus on the development and implementation of individual assessment protocols. Nurses are unlikely to give high priority to feeding patients and monitoring their nutritional status without a better understanding of the importance of good nutrition in relation to health and disease⁶.

There is growing interest on changes in disease patterns in relation to foods and nutrition. Confusion about nutritional matters abounds and people are easily drawn into believing distorted messages, which encourage expenditure on worthless dietary products, books and supplements⁴⁴. Doctors and nurses are perceived to be the most reliable source of nutritional information. However, few of them have the time, knowledge or skills to give sound nutritional advice or to recognize nutrition related problems⁴⁵. In addition, there is little published information about nurses' perception of their role in nutritional care and their knowledge of nutritional principles as well as practices⁶.

1.8 CONCLUSION

Malnutrition in hospitals is often unrecognized because nutrition is not a priority²⁰. Surveys have shown that 20-50% of hospital admissions suffer from nutritional depletion and that there is failure to recognize the existence of the problem because clinical staffs are not trained to look for the signs¹. If there are no doctor's orders to measure a patient's height or weight, it is often not done. In addition lack of necessary equipment and skills needs to be addressed. Simple bedside techniques of measuring nutritional status should be used in surgical patients to determine those patients at risk of developing malnutrition in order to reduce the incidence of pre and post-surgical complications and mortality¹⁹.

Provision of adequate nutrition is recognized as essential in surgical patients and yet malnutrition continues to be reported in patients admitted to hospitals³². This interferes with recovery, prolongs length of hospital stay, rehabilitation, as well as increases health care costs³³. Patients' outcome can be improved and costs reduced if appropriate nutrition is ensured in hospitals⁴⁶. Adequate nutrition is needed for patients to regain their health. Traditionally this has been the nurse's responsibility. In Kenya, nurses are in the best position to ensure good nutrition because of their holistic caring role. Nowadays, feeding the patient may be seen as a less valuable nursing task, with food being served and cleared away by

catering staff and many patients left to manage their meals themselves⁶. Currently, very few studies have been done on nutritional knowledge attitudes and practices of nurses in Africa³⁵. Most studies have been done in the developed world^{12, 39, 41-42}. None so far have been documented in Kenya.

This study has evaluated the current level of nutritional knowledge of registered nurses, assessed their awareness of nutrition in etiology, prevention and treatment of diseases and examined their attitudes and practices in relation to nutrition. The extent of nutrition teaching within the curricula of the relevant nursing programmes has also been determined. The findings will help in designing appropriate programmes to improve nutritional knowledge, which will in turn affect their attitudes and practices. This programme may be used by different health institutions, thereby improving the nutritional status of hospitalized patients as well as outpatients within the African context.



CHAPTER 2: METHODOLOGY



2.1 RESEARCH OBJECTIVES

2.1.1 Research Problem

Provision of adequate nutrition is recognized as essential, yet malnutrition continues to be reported in patients admitted to hospital⁶. In Kenya, the nurse is responsible for the overall assessment of patients, the nutritional status and progress of the patient and in making necessary nutrition related referrals. The ability to do this may strongly depend on the nurse's adequate knowledge on nutrition, perception of nutrition and an enabling environment.

2.1.2 Research Aim

To investigate aspects of the attitudes, nutrition related knowledge and practices of ward-based registered nurses working in the Surgical Division of Kenyatta National Hospital (KNH) Nairobi, Kenya.

2.1.3 Specific Objectives

- To determine the nutritional knowledge of registered nurses working in the Surgical Division
- To determine the attitudes of registered nurses towards the nutritional management of patients in the Surgical Division
- To determine the nutritional status of assessment methods used by registered nurses working in the Surgical Division
- To determine the practices of registered nurse towards nutrition intervention in patients in the Surgical Division

2.2. STUDY PLAN

2.2.1 Study Domain

The study domain was mainly quantitative with provision for qualitative responses from respondents.

2.2.2 Study Design

This was a descriptive observational study.

2.3 STUDY TECHNIQUES

The questionnaire was administered with four different sections assessing aspects of:

- Socio-demographic information of registered nurses
- Nutritional knowledge of registered nurses regarding the nutrition and nutritional status assessment of surgical patients
- Attitudes to nutrition intervention in the surgical patient using a Likert scale of responses to a statement
- Nutritional resources currently used in assessing nutritional status of patients, interventions applied by registered nurses as well as practices towards nutritional care of surgical patients



2.4 STUDY POPULATION

The study population was registered nurses (KRN) working in the Surgical Division of KNH based in Nairobi, Kenya.

2.4.1 Sample Selection

Purposive sampling was used to select the sample. A list of all registered nurses working in the Surgical Division at KNH was obtained from the assistant chief nurse in-charge. The nurses received letters (Addendum 1) requesting them to willingly participate in the study. The head nurse in-charge of each surgical unit/ward informed the registered nurses about the study and distributed the questionnaires. Each questionnaire distributed was coded as per the surgical unit and the number of the registered nurses working in the unit in a sequential manner (i.e. ward 9A 1, 9A 2 - 9A 10).

2.4.2 Sample Size

It was reported that 399 nurses worked in the Surgical Division (Table 2.1), of which, 160 were KRN's* and 239 were enrolled nurses. Out of the 160 KRN's 7 had a Bachelor of Science in nursing, while the other 153 were diploma holders. The study sample therefore included all 160 of the KRN working in the Surgical Division.

2.4.3 Inclusion Criteria

The registered nurses who were included in the study had to be:

- Kenyan citizen.
- Kenyan trained nurses
- Kenyan registered nurses *
- Employee of KNH
- Male or female
- Working in the Surgical Division for at least two months and was still working there by the time of the interview

2.4.4 Exclusion Criteria

Registered nurses excluded from the study included those who:

- Refused to participate
- Were on either annual or maternity leave at the time of the data collection

* Kenyan Registered Nurse

To be a Kenyan registered nurse, one must have a diploma in nursing and above, and must be registered with the Nursing Council of Kenya (NCK) after sitting for and passing the Nursing Council Exam. The registration of nurses is renewed every three years by NCK. Each nurse is required to have achieved at least 20 hours of continuous education from different areas of clinical practices (conferences, continuous medical education, continuous nursing education) each year.

Table 2.1: Structural summary of the Surgical Division at KNH.

WARDS	SURGICAL UNITS	TOTAL NUMBER OF REGISTERED NURSES
Special Units		
4A	Ophthalmology	7
4B	Cardiothorasic	9
4C	Neurosurgery	9
4D	Plastic surgery	9
5C	Ear nose and throat (ENT)	8
9A	Eye surgery	8
General Wards		
5D	General surgical cases	7
5A, 5B	Dental cases	17
Orthopaedic		
6A, 6C, 6D	Orthopedic (Adult)	36
6B	Orthopaedic (Pediatrics)	8
Private Wing		21
9C, 10A, 10B, 10C, 10D	General ward	
Clinics	Ear nose and throat clinic	6
	Eye clinic	2
	Dental clinic	5
	Orthopedic clinic	2
	Surgical out patient clinic	6
Total		160

2.5. METHODS OF DATA COLLECTION

2.5.1 Logistics Consideration

Purposively selected participants were invited to participate in the study. A follow up telephone call was used to schedule an appointment if the participant was willing to participate in the study. The researcher visited the participants at their place of work to collect data by completing the questionnaire. A period of three months was used to collect the data.

2.5.2 Questionnaires

2.5.2.1 Pilot study

The researcher conducted a pilot study at Mbagathi Provincial Hospital[†] (MPH) to test the questionnaires for comprehension and clarity. Ethics approval for the pilot test was obtained from the Committee for Human Research of the Faculty of Health Sciences, Stellenbosch University on 20 May 2005 as well as from MPH Nairobi on 03 May 2005 (Addendum 4).

The aim of the pilot study was to validate the questionnaire's content for the registered nurses. The participants were to ensure the questions were specific, well structured (face validity) and were addressing basic nutrition and specific surgical nutrition questions that were relevant to the nursing staff (content validity).

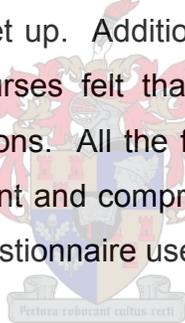
The first phase of the pilot study was conducted between 15 and 30 June 2005 and the second phase of the pilot study was conducted between 18 and 30 August 2005.

A list of all Kenyan trained and registered nurses working in the Surgical Division at MPH were obtained from the sister in charge of the Surgical Division. After which the first 10 participants who had worked in the Surgical Division for more than two months were contacted in person and those who were willing to

[†] MPH is situated approximately 10 kilometers away from the KNH. It's a small hospital compared to KNH with a bed capacity of approximately 300 beds compared to 2000.

participate in the pilot study were selected. Each pilot study participant completed the questionnaire and provided written comments independently on the existing questions.

The researcher incorporated all the suggestions made and the revised questionnaire was then returned to all the participants for a second review. A total of eight registered nurses were available for the second review as the other two refused to participate again. Most of the changes made were related to the multiple choice questions which were made more specific and comprehensive and repetition was eliminated. They also noted that the questionnaire was too long thus the questions were reduced from 55 to 47 questions. Eliminated questions were those that were mostly highlighted as being too technical (knowledge section (n-4)) or not applicable (socio-demographic section (n-2) and practical section (n-2)) in their set up. Additionally, open-ended questions were incorporated as most of the nurses felt that they needed to give their own comments in some of the questions. All the final suggestions made were used for the improvement of the content and comprehension of the questionnaire and were incorporated in the final questionnaire used in this study.



The 47-item validated questionnaire consisting of 9 socio-demographic questions, 13 questions on nutrition knowledge, 13 questions on attitude and 12 questions on nurse's practices formed the basis of this study.

2.5.2.2 Socio-demographic information

This section comprised of 9 questions aimed at gathering basic and background information such as gender and age. The aim of the section was also to determine if the registered nurses had any formal training in nutrition while in college, how many hours of training was allocated to nutrition, what topics on nutrition the registered nurses concentrated on, which colleges they attended as well as years of work and experience in the Surgical Division (Addendum 2; section A).

2.5.2.3 Nutrition knowledge

This section contained 13 questions. The questions were aimed at assessing the registered nurses' knowledge on certain aspects of both clinical and basic nutrition knowledge (Addendum 2; Section B) specifically related to surgical patients. The Medical Training syllabus for nurses in Kenya⁴⁷⁻⁴⁹, which included 13-14 hours of nutrition training was used as a basis and the format of this part of the questionnaire was adapted from a knowledge test adopted from a previous study done in Lebowa, South Africa³⁵.

The questions on knowledge were further divided into two sets assessing basic nutrition knowledge (Addendum 2; Section B, Q 2-6, and 13) and clinical nutrition knowledge (Addendum 2; Section B, Q1, 7-12).

Six questions on basic nutrition assessed certain aspects of nutrient metabolism, sources of nutrients, dietary guidelines, food safety, food groups, and the functions of nutrients. Seven questions on clinical nutrition assessed energy content of food, energy requirements of surgical patients, nutrient requirements of surgical patients, methods of feeding, micronutrient supplementation, as well as the choice of nutrient administration. The registered nurses had to choose one correct answer amongst four possible multiple choice answers, from which only one was the correct answer to the questions asked (Addendum 2: Section B). All the questions that were left blank were regarded as incorrect.

2.5.2.4 Attitude towards nutrition therapy

This section assessed registered nurses' attitude towards nutritional care of patients. A statement was made and a 4-point Likert scale was used to determine degree of agreement (Addendum 2; section C). This section also included an open-ended question aimed at assessing the attitude of nurses towards what they felt their role was in the nutritional management of surgical patients.

2.5.2.5 Practices of nurses

This section comprised of 13 questions aimed at assessing registered nurses' actions regarding daily routine and format of assessing nutritional status of surgical patients. This section specifically assessed methods of nutritional status assessment, appropriate referrals and intervention taken by nurses during their daily patient care, whether nutritional management was discussed during ward rounds and also an open-ended question asking what the registered nurses thought would be the best way to improve the nutritional care of patients. Methods used for assessing nutritional status were also assessed (Addendum 2; section D).

2.6 DATA COLLECTION PROCEDURE

2.6.1 Instructions to Subjects

The questionnaire together with a covering letter inviting the registered nurses to participate in the study together with an explanation of the purpose of the study and assurance of confidentiality and anonymous management of the data was hand delivered to the study participants at their places of work by the researcher. The consent forms that included the researchers' contact details were also provided to the registered nurses.

A questionnaire (Addendum 2) was completed with different sections assessing socio-demographic information, knowledge, attitudes and practices. The researcher was personally involved in collecting most (n=60) of the data and was therefore available for clarification, while some (n=50) of the registered nurses took the questionnaires and completed them at home or after their working hours. Before any data was collected the participants received and signed an informed consent form (Addendum 3).

2.7 DATA ANALYSIS

Data was entered in Microsoft Excel software, and analysis was performed using Statistical Package for Social Sciences (SPSS) Version 12.0 and Statistica. (StatSoft, Inc. (2004) STATISTICA (data analysis software system), version 7 www.statsoft.com).

Descriptive Statistics:

The following components were described using descriptive statistics.

- Socio-demographic characteristics
- Registered nurses' knowledge by calculating the percentage of the correct responses.
- Nurses' attitudes
- Nurses' practices

Inferential Statistics:

Chi-square tests were used to test for differences in proportions between males and females. Pooled student t-tests or alternatively Welch t-tests (when variances of males and females differed significantly) were used to test for differences in age and total knowledge levels between the males and females.

The relationship between the following was investigated using analysis of variance (ANOVA) and/or non-parametric ANOVA:

- Knowledge and attitudes
- Knowledge and practices
- Attitudes and practices

The knowledge scores were determined by taking the number of correct responses by each respondent out of the 13 knowledge questions asked expressed as a percentage.

The percentage scores were graded (Table 2.3) to determine whether nurses' knowledge levels were poor, average or adequate. The grading table was

designed by the researcher as there was no standard scoring table available in the literature.

Table 2.2: The grading system used to classify the registered nurses' nutritional knowledge levels.

Scores	Level
0-40%	Poor
41-70%	Average
71-100	Above average

Level of Significance

A p-value of less than 0.05 was considered to be statistically significant.

2.8 ETHICS CONSIDERATION

2.8.1 Ethics Review Committees

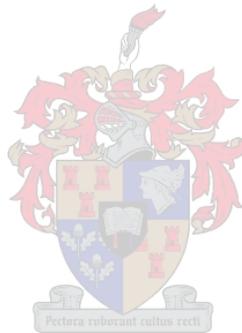
The study was approved by the Human Research Committee of the Faculty of Health Sciences of Stellenbosch University, Tygerberg South Africa, (Project number: N05/03/055) (Addendum 5) as well as Kenyatta National Hospital Ethical Review Committee (Research reference number: KNH-ERC/01/2849) (Addendum 6). The participant did not receive any incentives or remuneration of any kind.

2.8.2 Informed Consent

Each participant was provided with an informed consent form by the investigator. The standard informed consent form used by the Faculty of Health Sciences of Stellenbosch University was used. The informed consent form which was written in English was adapted for the specific research study (Addendum 3).

2.8.3 Confidentiality

No name was required when completing the questionnaire. Upon entering the study, each participant received a subject identification number which was used on all study related material and documentation. The participant was ensured both verbally and by means of the informed consent form that all conversation and information provided to the investigator was to be regarded as confidential. Information provided to the investigator was only to be used for the specified study, and was not to be shared for any other purposes or projects.



CHAPTER 3: RESULTS



3.1 SAMPLE CHARACTERISTICS AND FINDINGS

The study was conducted between 5 July and the end of September 2005. A total of 160 questionnaires were distributed to all the KRN's working in the Surgical Division, out of which 138 complied with the inclusion criteria (22 were on annual or maternity leave) and 101 completed the questionnaire (37 declined to participate). These 101 questionnaires, representing a 73% response rate, were used for data analysis (Table 3.1). The reasons given by various registered nurses for declining to participate were mainly because some felt that the questions on nutrition were more appropriate for the dietitians/nutritionists and not the nursing staff (n=10). Some declined to participate because there were no payouts to those who participated as they repeatedly commented that some researchers did pay them for their participation (n=6). Some felt the questionnaire was too long and did not have time to attend to it (n=8), while others declined to participate without giving any reasons (n=13). Of the 101 participating registered nurses the majority (87%), were based in inpatient compared to 13% who were based in surgical outpatient clinics (Table 3.1).

Eighty of the questionnaires were self-administered. This was mainly because the registered nurses felt that they did not have enough time to complete the questionnaire while at work because of their work load so most of them opted to complete the questionnaire at home or after working hours. The remainder completed the questionnaire in the presence of the investigator who was available for clarifications. The investigator also checked the questionnaires for completeness when those registered nurses who completed the questionnaires at home returned them. Some of the registered nurses (n=8) did not return their questionnaires and were classified under those who refused to participate.

Table 3.1: The proportion of data collected from the different surgical units at KNH.

Surgical units	No of KRN	Nurses on leave	Questionnaires completed	Questionnaires not completed	% Respondents
Special units					
Cardiothorasic	9	2	7	0	100%
Neurosurgery	9	2	6	1	86%
Plastic surgery	9	2	6	1	86%
ENT	8	0	6	2	75%
Eye surgery	8	2	6	0	100%
Ophthalmology	7	2	3	2	60%
General wards					
General surgery	7	1	4	2	67%
Dental	17	3	11	3	79%
Orthopedic wards					
Orthopedic adult	36	4	19	13	59%
Orthopedic paed	8	0	6	2	75%
Private wing General	21	4	13	4	76%
Clinics					
E.N.T	6	0	5	1	83%
Eye clinic	2	0	2	0	100%
Dental clinic	5	0	3	2	60%
Orthopedic	2	0	2	0	100%
Surgical OPC	6	0	1	5	17%
TOTAL (response rate)	160	22	101	37	73%

3.2 SECTION A: SOCIO-DEMOGRAPHIC INFORMATION

3.2.1 Gender

Of the total 101 respondents 15 (15%) and 86 (85%) were male and female respectively

3.2.2 Age

The mean age of the respondents was 37.7 (SD 8) years with a range of 25 to 55 years (Table 3.2). The mean age of the female respondents was generally higher, 37.7 (SD 8) years compared to that of the males 34.6 (SD 6) years, but the difference was not significant (Mann-Whitney test, $p=0.25$). The Non-parametric test (Mann-Whitney) was used since the residuals of the age variable were checked for normality and they were not normally distributed.

Table 3.2: Summary of the socio-demographic information of the registered nurses in the study

Socio-demographic characteristics	Male n=15 (%;SD)	Female n=86 (%;SD)	Total n=101 (%;SD)
Mean Age (SD; years)	34.6 (6)	37.7 (8)	37.2 (8)
Highest level of nursing training			
Diploma	14 (93%)	78 (92%)	92 (92%)
Degree	1 (7%)	7 (8%)	8 (8%)
Post-graduate	0	0	0
Institution received training from			
Public	13 (87%)	58 (73%)	71 (76%)
Private	2 (13%)	21 (27%)	23 (24%)
Nutrition as part of nursing school training	15 (100%)	80 (95%)	95 (96%)
Mean time spent on nutrition training (years)	0.11 (0.1)	0.17 (0.1)	0.16 (0.2)
Formal nutrition training in addition to nursing school training	0	9 (11%)	9 (9%)
<i>Topic concentrated on during formal nutrition training (n=9)</i>			
Clinical nutrition	0	0	0
Community nutrition	0	4 (44.4%)	4 (44.4%)
Basic nutrition	0	4 (44.4%)	4 (44.4%)
Both clinical and community nutrition	0	1 (11.1%)	1 (11.1%)
Mean number of years worked in surgical ward	4.2 (4)	5.4 (5)	5.3 (5)

3.2.3 Level of Nursing Training

This set of questions (Addendum 2: section A, questions 3-5) intended to determine the Kenyan registered nurses' highest level of training, identify the different training colleges the respondents attended during their nursing course and whether nutrition formed part of their nursing course or not.

Ninety-two percent of the respondents were diploma holders, of which 78 (85%) were female and 14 (15%) males (Table 3.2). Seven percent of them were degree holders with females accounting for 7 (88%) and males 1 (12%) of the subjects.

The majority of the respondents 71 (76%) attended public colleges with a larger proportion of them having trained at KMTTC Nairobi. Twenty three (24%) attended private institutions, 7 of them did not state the institution from which they received their training. There was no significant difference between the males and females with regard to the type of training institution they attended (Chi-square =1.197, df=1, p=0.35).

The majority of the respondents 95 (96%) indicated that nutrition was part of their training in college while 4 (4%) did not have any nutrition training in college.

3.2.4 Nutrition Training

This set of questions (Addendum 2, Section A question 6-7) intended to identify how much time was allocated for nutrition education during the nursing training while in college, and also find out if there was any additional nutrition training the registered nurses underwent after college.

The minimum time spent on nutrition training was 0.0005 years (4 hours) (Table 3.2) while the maximum time was 0.67 years (8 months) with a mean training time of 0.16 years (1.9 months). When asked whether they had received any other formal nutrition training apart from their nursing school training, 90 (91%) of the respondents indicated that they did not while 9 (9%) indicated they had gone

through some form of formal nutrition training after college. Of the 9 registered nurses that had had some formal nutrition training after college, 4 (44%) of them reported that they concentrated on basic nutrition, 4 (44%) concentrated on both clinical and community nutrition while 1 (11%) concentrated on community nutrition.

3.2.5 Work Experience

The mean number of years that the registered nurses had worked in the surgical ward was 5.3 (SD 5) years ranging from 0.17 years to 21 years (Table 3.2).

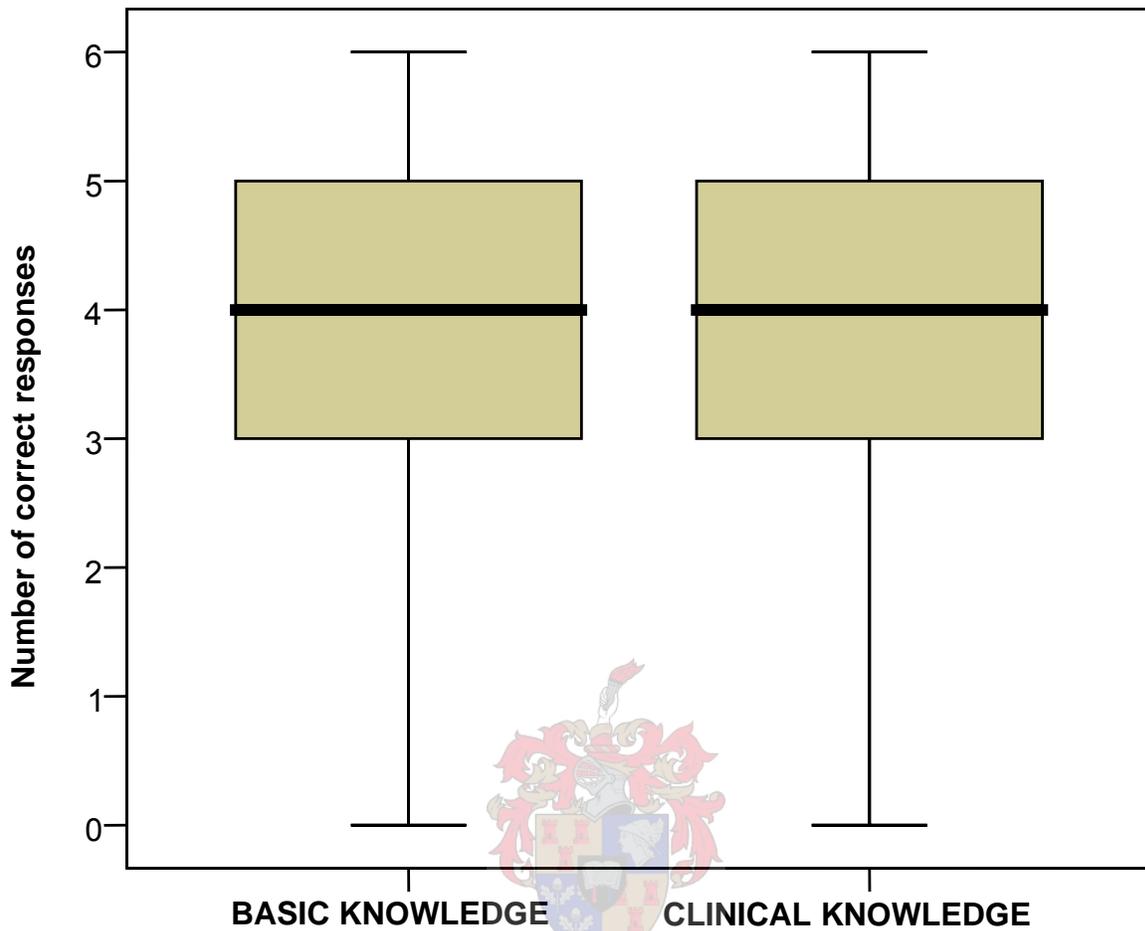
3.3 SECTION B: KNOWLEDGE

The knowledge score was 57% [mean of 7.4 (SD 2) correct answers out of 13 knowledge questions] indicating an average knowledge level. Male respondents scored higher than the females with a knowledge score of 60% [mean of 7.8 (SD 2) correct answers] and 57% [mean of 7.3 (SD 2) correct answers] respectively. There was no significant difference in the mean knowledge scores between the females and males (pooled t-test, $p=0.41$). Residuals were checked for normality and they appeared to be normally distributed thus justifying the use of the t-test parametric test above.

The questions on knowledge were further divided into two sets of knowledge assessing basic nutrition knowledge (Q2,3,4,5,6,13) and clinical nutrition knowledge (Q1,7,8,10,9,11,12) (Table 3.3). When the knowledge question were analyzed for the two knowledge categories, there was no significant difference between the basic and clinical nutrition mean knowledge scores, with a mean basic knowledge score of 63% 3.8 (SD 1) correct answers out of 6 basic nutritional knowledge questions (95% confidence interval [CI], 3.55 – 4.06) and a mean clinical knowledge score of 53% 3.7 (SD 1) correct answers out of 7 clinical nutritional knowledge questions (95% confidence interval [CI], 3.48 – 4.04) (Figure 3.1).

Table 3.3: The number of correct responses to the basic and clinical nutrition knowledge questions (n=101).

Question No.	Topics	n (% correct)
Basic nutrition		
2	Nutrient metabolism	37 (37%)
3	Functions of micronutrient	62 (61%)
4	Functions of macronutrients	52 (52%)
5	Sources of nutrients	80 (79%)
6	Dietary goals	55 (55%)
13	Food safety	91 (90%)
Clinical nutrition		
1	Energy content	14 (14%)
7	Energy requirements	81 (80%)
8	Metabolic requirements	86 (85%)
9	Nutrient requirements	64 (63%)
10	Nutrient supplementation	71 (70%)
11	Method of feeding	24 (24%)
12	Choice of nutrient administration	32 (32%)



The nature of these Box-plots is as follows; the middle line is the median, the box indicates 25% and 75% quartiles and the whiskers the minimum and maximum values.

Figure 3.1: Box plots of responses to the clinical and basic nutrition knowledge.

3.3.1 Basic Nutrition

3.3.1.1 Nutrient metabolism

This question **“Some vitamins may accumulate in the body to dangerous levels if large doses of vitamin supplements are frequently taken. Examples of this would be?”** (Question 2) was intended to determine the nurses’ knowledge on nutrient metabolism. The majority of the registered nurses

did not know the metabolism of nutrients as shown by 64 (63%) who answered the question incorrectly, the other 37 (37%) answered correctly (Table 3.3).

3.3.1.2 Knowledge on vitamin C

This question “**Vitamin C is not involved in?**” (Question 3) intended to determine the registered nurses’ knowledge on functions of nutrients. The majority of the respondents knew the functions of vitamin C as indicated by 62 (61%) who correctly answered the question compared to 39 (39%) who did not know the nutrient function.

3.3.1.3 Function of carbohydrates

This question “**Carbohydrates are needed by the body for?**” (Question 4) was aimed at determining the registered nurses’ knowledge on functions of nutrients. Fifty-two percent (52 from 101) of the respondents could identify the function of carbohydrates while the other 49 (48%) answered the question incorrectly.

3.3.1.4 Foods rich in protein

This question “**Which groups of food listed below are high in protein?**” (Question 5) was to determine the registered nurses’ knowledge on sources of nutrients and if they could easily identify which group of foods comprised of only protein rich foods from the ones that contained a group of carbohydrate rich and protein rich foods as well. This question was well answered with a high score of 79% (80 from 101) correctly answering the question compared to the other 21 (21%) who did not answer it correctly.

3.3.1.5 Dietary goals

The significance of this question “**The minerals most often at risk of being deficient in the average diet are?**” (Question 6) was to determine registered nurses’ knowledge on dietary goals with emphasis on minerals like iron (Fe), calcium (Ca), iodine (I), sodium (Na), chlorine (Cl) and potassium (K). Fifty-five percent (55 from 101) of the respondents knew the dietary goals by correctly

indicating that the minerals most commonly deficient in the average diet are Ca, I, and Fe while 46 (45%) answered incorrectly.

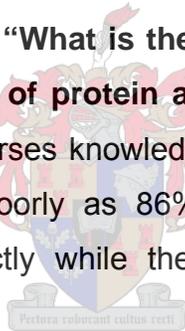
3.3.1.6 Food safety

The significance of this question “**Refrigeration of some foods is necessary to?**” (Question 13) was to determine the registered nurses’ knowledge on food safety specifically regarding the purpose of refrigeration. Ninety percent (91 from 101) of the respondents answered the question correctly as they indicated that refrigeration of some foods is necessary to stop bacterial growth.

3.3.2 Clinical Nutrition

3.3.2.1 Energy content.

The significance of this question “**What is the approximate energy value of 1 gram of carbohydrate, 1 gram of protein and 1 gram of fat?**” (Question 1) was to find out the registered nurses knowledge on energy content of nutrients. This question was answered poorly as 86% (87 from 101) of the subjects answered the question incorrectly while the other 14 (14%) answering the questions correctly (Table 3.3).



3.3.2.2 Nutrient requirements

This question “**A person’s nutrition requirements increase following trauma or surgery.**” (Question 7) was intended to determine the registered nurses’ knowledge on the body’s energy requirements during the state of critical illness. Eighty percent (81 from 101) of the respondents answered correctly by agreeing that the energy requirements of patients increase in cases of trauma or surgery while 20 (20%) did not agree.

3.3.2.3 Energy requirements

This question “**Do surgical patients require additional nutrients over and above the normal requirements?**” (Question 8) aimed at identifying if the registered nurses were aware that the nutrient requirements of surgical patients

actually increase above the normal nutrient requirement. The majority of the respondents 86 (85%) agreed that the energy requirements do increase in surgical conditions and they scored correctly while the other 15 (15%) responded incorrectly.

3.3.2.4 Initiation of feeding after surgery

The question “**How long can a patient remain without food after surgery?**” (Question 9) was to determine how soon feeding should be resumed after surgery. Thirty-seven percent (37 from 101) did not know the best time to start feeding the surgical patient as some felt that feeding the patients should preferably be resumed after two weeks. Some noted that feeding should be resumed within 24 hours after the surgery regardless of the type of surgery while the majority 64 (63%) who answered the question correctly agreed that feeding should be resumed immediately once the patient is haemodynamically stable either orally, parenterally or enterally.

3.3.2.5 Micronutrient requirements

The question “**Should micronutrients be given if the patient cannot be fed?**” (Question 10) was aimed at determining the respondents’ knowledge on the role and requirements of micronutrients in surgical patients. Seventy percent (71 from 101) of the respondents answered the question correctly as they strongly agreed that micronutrients should be supplemented in surgical patients who cannot feed while 30 (30%) noted that it was not necessary to give micronutrients supplementation to these kinds of patients.

3.3.2.6 Method of feeding

The question “**What is the preferred route of feeding, for a patient with a functional gastrointestinal tract who cannot swallow?**” (Question 11) was aimed at determining the registered nurses’ knowledge on different modes of feeding and how to make the best choice of nutrient administration to patients with different surgical conditions. It appeared that most registered nurses did not

quite understand the different routes of feeding and how to tailor the best one for a particular condition as indicated by 77 (76%) who answered the question incorrectly. Some of the registered nurses who answered incorrectly noted that a patient with a functional gastrointestinal tract and who cannot swallow should be fed through the parenteral route while others noted that a combination of both enteral and parenteral route would be the most appropriate method of nutrient administration. Some noted that oral feeding was the only solution even though the patient could not swallow. Twenty-four percent (24 from 101) however answered the question correctly by indicating that Enteral nutrition was the preferred way of nutrient administration in this set of patients.

3.3.2.7 High output fistulae

The significance of this question “**Patients with high output fistulae of above 500mls should preferably be fed?**” (Question 12) was to determine the registered nurses’ knowledge on the best route of nutrient administration especially in some cases experienced in surgical conditions such as fistulae. Thirty-two percent (32 from 101) of the respondents answered the question correctly by indicating that patients with high output fistulae should preferably be fed by the parenteral route while 69 (68%) answered incorrectly noting that these kind of patients should be fed enterally, orally or both enterally and parenterally.

3.4 SECTION C: ATTITUDE

This section assessed the attitudes of nurses towards the nutritional management of patients. The main aim was to find out if the registered nurses’ attitudes affects their nutritional management of patients.

3.4.1 Responsibility for Nutritional Status Assessment

The purpose of this statement “**It is the nurse’s responsibility to assess nutritional status of patients**” was aimed at determining the registered nurses attitudes towards their responsibility in the nutritional assessment of patients.

Twenty-six percent (26 from 101) of them strongly agreed that nutritional status assessment of patients was indeed the nurses' responsibility and 53% (53 from 101) agreed with the statement. Thirteen percent (13 from 101) disagreed while 7 (7%) strongly disagreed that it was not the nurses' responsibility to assess the nutritional status of patients (Figure 3.2).

The significance of the statement **“It is the dietitians’/nutritionists’ responsibility to assess nutritional status of patients”** was to determine the registered nurses opinion on dietitian’s/nutritionist’s responsibility in the nutritional status assessment of patients. The majority of the respondents 71 (72%) strongly agreed that nutritional status assessment of patients was the dietitian’s/nutritionist’s responsibility, 25% (25 from 101) of them agreed while 1 (1%) and 2 (2%) disagreed and strongly disagreed respectively (Figure 3.2).

This statement **“It is the doctors’ responsibility to assess nutritional status of patients.”** was to determine the registered nurses opinion on doctors’ responsibility in the nutritional status assessment of patients. The majority of the respondents 59 (61%) agreed that nutritional status assessment was indeed the doctors responsibility, 24 (25%) strongly agreed, while 7 (7%) and 7 (7%) disagreed and strongly disagreed respectively that it was the doctors’ responsibility to assess the nutritional status of patients (Figure 3.2).

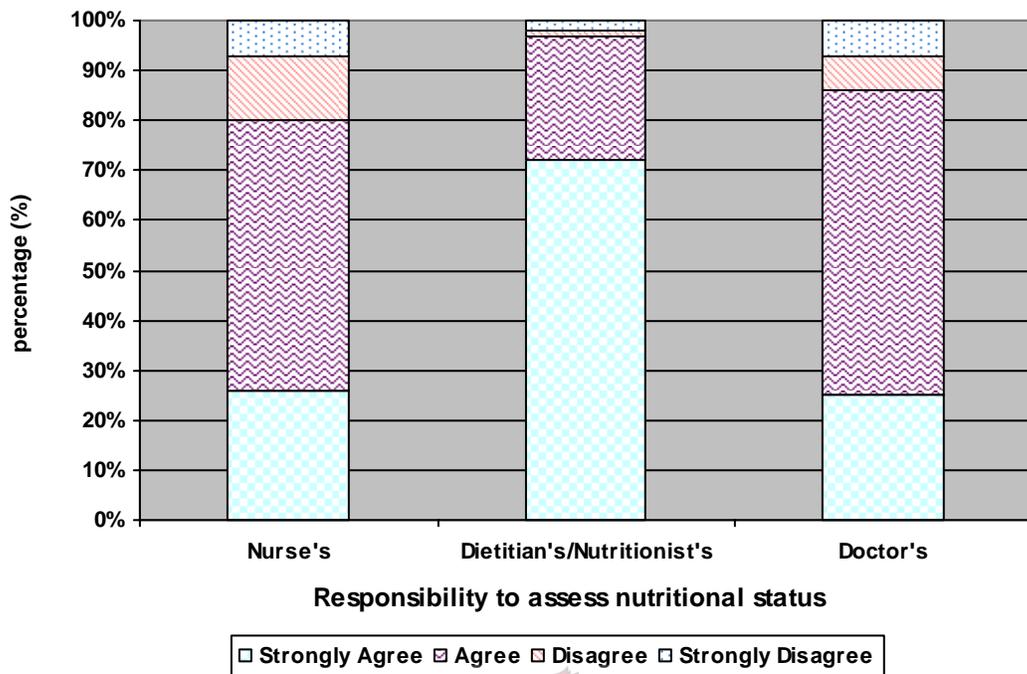


Figure 3.2: Percentage of responses regarding the nurses’ opinion on the professional responsible for assessing the patients’ nutritional status.



3.4.2 Nutrition Support

The intention of this statement “**Appropriate and adequate nutritional support is normally provided in the surgical ward**” was to determine the registered nurses opinion on the nutritional support provided to the surgical patients. Twenty-seven percent (27 from 101) strongly agreed with the statement and the majority (42%) agreed, however 25 (25%) disagreed while 5 (5%) strongly disagreed.

3.4.3 Assessment on Admission

This statement “**It is important to assess the nutritional status of every patient admitted to the ward**” was to determine the attitudes of registered nurses’ to nutritional status assessment of patients on admission. The majority of nurses (72%) strongly agreed that it was important to assess the nutritional

status of every patient admitted to the surgical ward, 26 (26%) agreed while 2 (2%) strongly disagreed. None of the respondents disagreed with the statement.

The significance of this statement “**It is important to weigh every patient upon admission**” was to determine if basic nutritional status assessment like measuring patients’ weight should be done on admission. Sixty-five percent (65%), who were the majority of the registered nurses, strongly agreed that it was important to weigh patients on admission and 29 (29%) agreed, while 5 (5%) disagreed and 1 (1%) strongly disagreed (Figure 3.3).

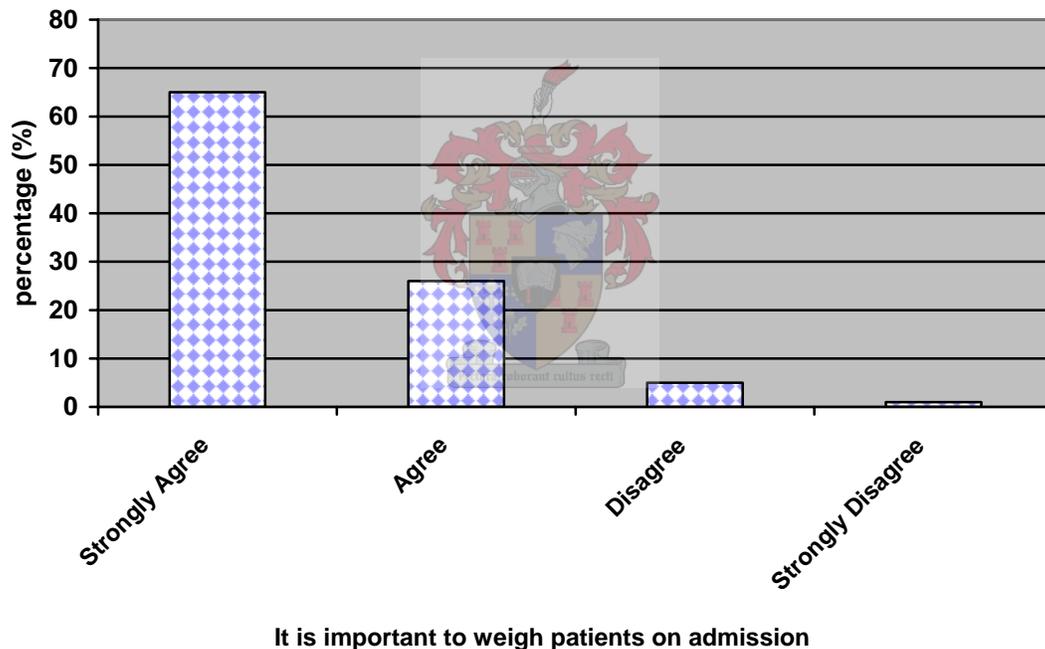


Figure 3.3: Registered nurses responses regarding their opinion of the importance of weighing the patients on admission.

3.4.4 Nutrition Education

This statement “**Nutritional education is not the responsibility of the nurse**” aimed at determining the registered nurses’ attitudes to their role as nutrition educators. The majority of the respondents (47%) disagreed with the statement indicating that nutrition education was the responsibility of the nurses, 35 (35%) strongly disagreed. Sixteen (16%) of the registered nurses however agreed that nutrition education was not their responsibility with 1 (1%) strongly agreeing.

3.4.5 Role of Nutrition in the Prevention and Treatment of Disease

The significance of this statement “**Nutrition has an important role in preventing diseases**” was to determine the registered nurses’ **opinion** regarding the benefits of nutrition in preventing diseases. The majority of the respondents, 84 (86%) strongly agreed that nutrition played a key role in the prevention of diseases, 13 (13%) agreed with the statement while only 1 (1%) strongly disagreed (Figure 3.4).

The significance of this statement “**Nutrition has an important role in treating diseases**” was to determine the registered nurses’ **opinion** on nutritional therapy in the management of diseases or deficiencies. The majority of the nurses, 58 (60%) strongly agreed that nutrition does play an important role in treating disease, while 35 (36%) agreed to the statement. The minority of the respondents (3%) however disagreed and 1% strongly disagreed with the statement indicating that nutrition does not play a key role in treating disease (Figure 3.4).

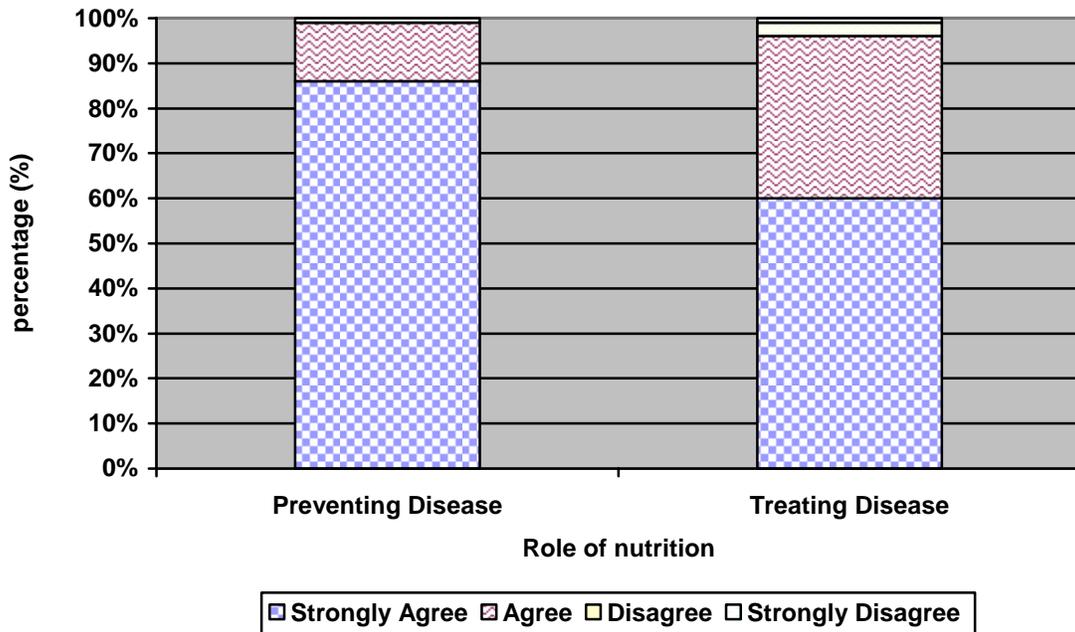


Figure 3.4: Registered nurses' attitude regarding the importance of nutrition in the prevention and treatment of diseases.

3.4.6 Pre-operative Nutrition

This statement “**Nutritional therapy before surgery is important**” was to determine the registered nurses' attitudes to nutrition intervention before patients go for surgery. The majority of the respondents, 69 (71%) strongly agreed that the patients should be well nourished before surgery. Twenty-three percent agreed with the statement while the other 4 (4%) and 1 (1%) disagreed and strongly disagreed respectively, noting that nutritional therapy was not necessary before surgery.

3.4.7 Nutritional Care for the Disabled

This statement “**Disabled persons should be given special attention during meal times**” was designed to identify the registered nurses' attitudes to nutritional care of the patients who require assistance with feeding because of any form of disability. The majority of the nurses, 51 (53%) strongly agreed that special attention should be accorded to the disabled during meal times, 25 (26%)

agreed with the statement while the other 17 (17%) disagreed and a minority of 4 (4%) strongly disagreed.

3.4.8 Nurses Knowledge on Nutrition

This statement “**Nurses are very knowledgeable in nutritional matters**” was to determine how the registered nurses’ rate their knowledge when it comes to nutritional matters. Twenty-one percent strongly agreed, while the others who were the majority (53%) agreed that nurses were indeed very knowledgeable in nutritional matters. The other 22 (23%) and 3 (3%) however disagreed and strongly disagreed respectively, indicating that they did not feel that they were very knowledgeable in nutrition matters.

3.4.9 The Role of Nurses in Nutritional Care

The significance of this statement” **What do you think is the nurses’ role in various aspects of nutritional management of hospitalized patients. Please comment**” was to find out what the registered nurses felt their role was in the nutritional management of patients. Of the 75 respondents to this question, almost a third, 24 (32%) felt that the nurses should assist patients with feeding and ensure patients get the right feed, 20 (26%) indicated that the nurse’s role would be to assess nutritional status of the patients and liaise with the dietitian/nutritionist, 12 (16%) felt that the nurse should assess nutritional status of patients, 11 (14%) said nurses should give nutritional counseling to the patients, 6 (8%) felt that nutritional management was not the responsibility of the nurse and that dietitians/nutritionists should take the full responsibility of assessing and feeding patients because of the nurses’ work load, and the minority 3 (4%) felt that the nurses should be at the forefront to advise dieticians/nutritionists on what they should feed patients on (Figure 3.5).

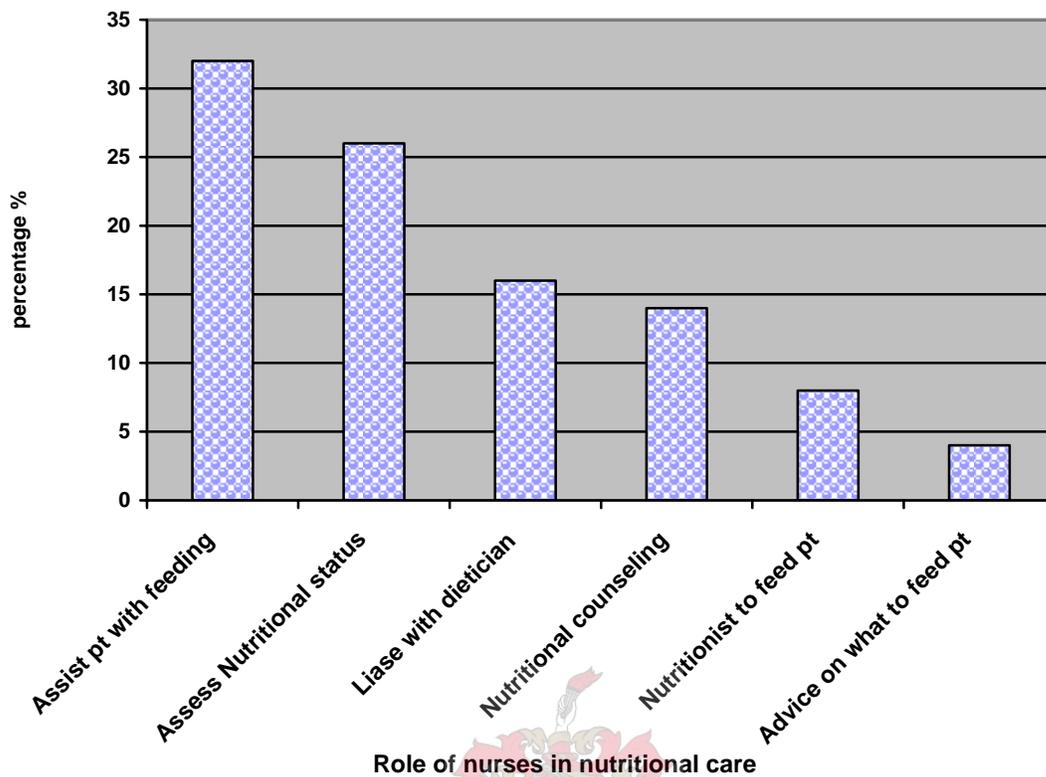


Figure 3.5: Registered nurses' responses toward their role in the nutritional management of surgical patients.

3.5 SECTION D: PRACTICES

This section was to determine the common and routine practices of the registered nurses towards the nutritional management of patients.

3.5.1 Nutritional Status Assessment

The significance of the question “**If you were assessing nutritional status of your patient, what criteria would you use? Please comment**” was to determine the methods used by registered nurses' to assess nutritional status of patients in the surgical unit. All of the 92 responses to this question indicated that they would use weight, height, BMI and diet history to assess the nutritional status of their patients. None of the respondents said they would check for vital

signs like blood pressure or pulse rate neither did they feel that doing a urinalysis was an appropriate method of assessing nutritional status of patients.

The question “**On what proportion of your patients do you carry out nutritional assessment**” intended to determine the proportion of patients who actually underwent nutritional status assessment while hospitalized. Forty-seven percent of the respondents noted that all patients did go through nutritional status assessment. Another 42 (47%) noted that not all but some patients did go through nutritional status assessment, 5 (6%) however noted that none of the patients go through nutritional status assessment.

This question “**Do you weigh your patients often on admission?**” determined whether nutritional status assessment with emphasis on whether the registered nurses’ actually weighed patients on admission or not. The majority, 38 (43%) indicated that they did weigh patients on admission, 22 (25%) noted that they did not weigh patients on admission, 2 (2%) said that they normally estimated weight, while 26 (30%) said that sometimes they weighed patients and sometimes not. Neither of the 2 respondents who reported estimating weight specified how they estimated weight, even though they were asked to indicate the method they used.

The significance of this question “**If you were to weigh patients, you would do so for what reasons: (please choose one answer)**” was to find out what would prompt nurses to weigh patients. The majority of the registered nurses 52 (59%) reported that they actually weighed patients for medication purposes, 16 (18%) of the respondents reported weighing patients to assess the nutritional status of patients, 15 (17%) also indicated that the only reason they weighed patients was because of the patient’s medical condition. The other 5 (6%) had other reasons for weighing patients which they did not specify (Figure 3.6)

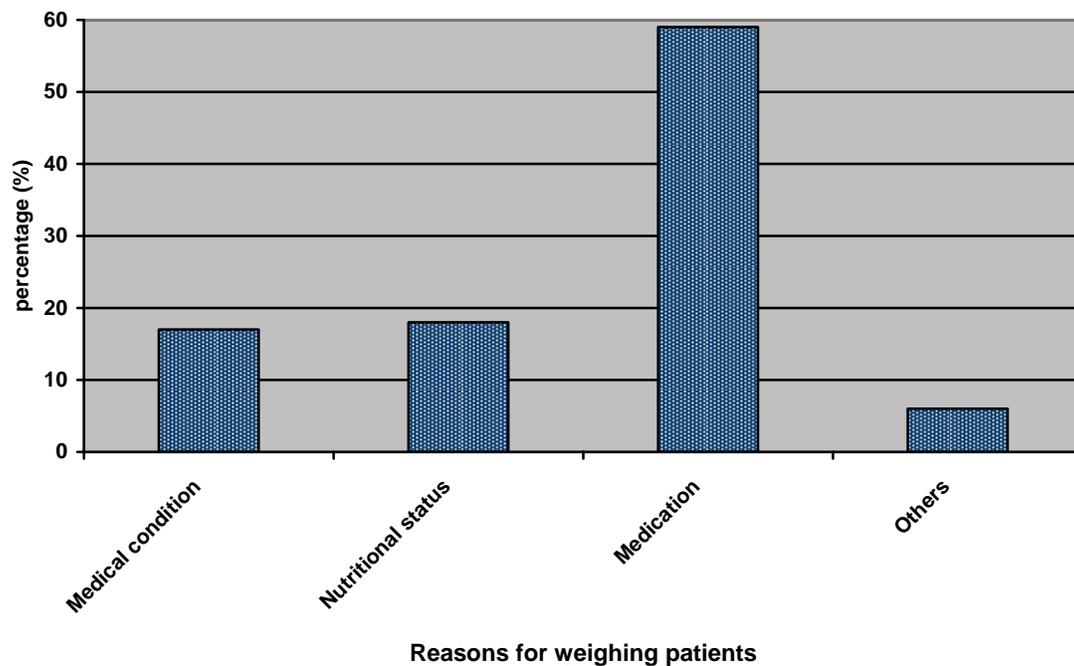


Figure 3.6: Registered nurses' reported reasons for weighing patients

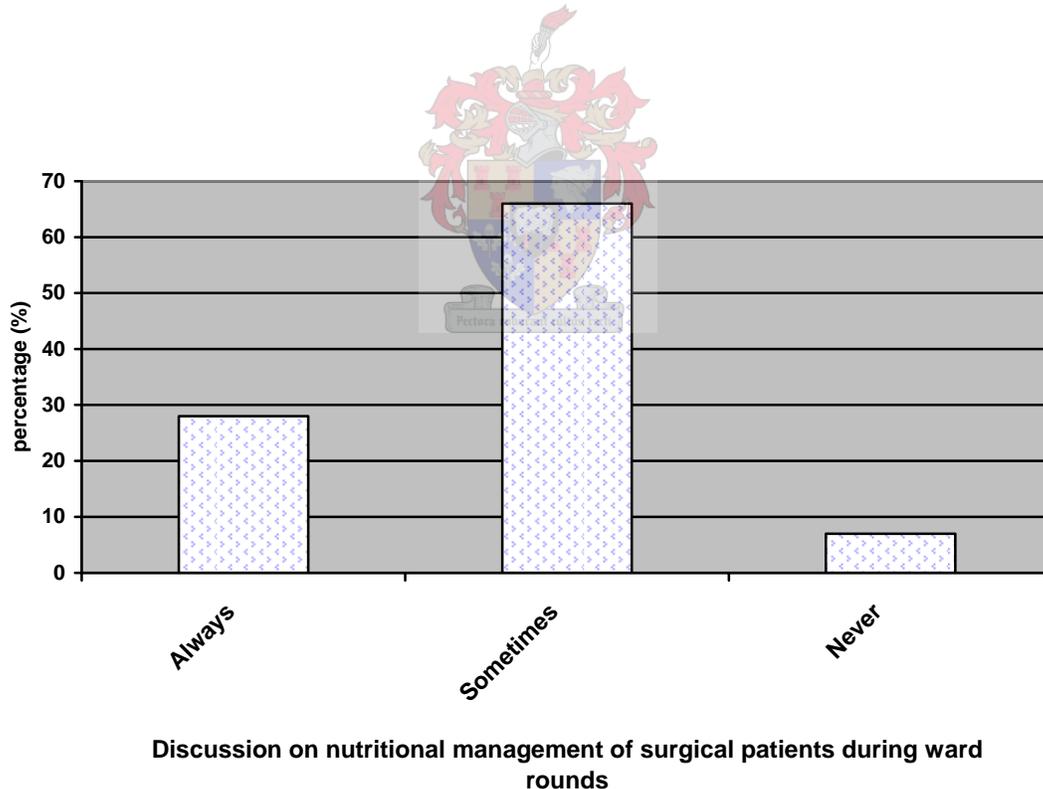
This question “**Which of the following anthropometric assessment tools do you use in your unit**” was to identify the tools commonly used to assess the nutritional status of patients in the surgical unit. The majority of the registered nurses 61 (89%) were more familiar with the anthropometric measurement tools and mainly used the weight scale. Fourteen (14%) noted that they actually used the stadiometer for anthropometric assessment, while the minority 4 (5%) indicated that they used other anthropometric tools which they did not specify. None of the respondents used waist circumference in their unit.

3.5.2 Ward Rounds

The purpose of this question “**Do you always discuss nutritional status and nutritional management of patients during ward rounds**” was to find out if nutritional therapy was a factor considered during ward rounds. The majority 59 (66%) of the respondents indicated that nutritional management of patients was occasionally discussed during the ward rounds, 25 (28%) of the respondents

reported that nutritional therapy was always discussed during ward rounds, while 6 (7%) noted that no discussions on nutritional management of patients took place during ward rounds (Figure 3.7).

When asked to identify the possible reasons why nutritional matters were not discussed during ward rounds, a few of the respondents who responded to the question said that: “doctors are always in a hurry and nutritionists[‡] do not join ward rounds”, some said it was due to negligence or oversight and doctors always did their own ward rounds. Some reported that patients were well nourished and therefore did not need nutritional intervention. Some indicated that there was no indication for nutritional discussion, while one respondent in particular felt that there was no time for such discussions as nutritional matters should be referred to the dietitian/nutritionist.



[‡] In Kenya, although trained in dietetics there is no registration of dietitians and those doing the work are referred to as nutritionists.

Figure 3.7: Summary of responses towards discussions on nutritional management of surgical patients during ward rounds.

3.5.3 Referrals Made when Patients are not Receiving Adequate Nutrition

The question **“What would you do if you felt that the patient was not receiving adequate nutrition”** was to identify if the nurses acknowledged different specialties and functions of different health professionals in the patient’s nutritional management. An overwhelming majority of the registered nurses (82%) said that they would consult the dietitian/nutritionist, while 16 (18%) indicated that they would take the opportunity to discuss dietary options with the patient themselves. None of the respondents reported that they would refer the patient to the doctor.

3.5.4 Feeds Administered to Patients on Tube Feeds

The significance of this question **“What feeds do you normally give your patients on tube feed”** was to identify the type of feeds given to patients on tube feeds in order to ascertain whether patients were fed adequately or not. The majority of the registered nurses, 35 (41%) said that they fed patients on kitchen-made feeds i.e. soups. Twenty-nine percent said that they fed their patients on tube feeds with porridge and milk. Of the 23 (27%) who reported that they used other feeds, 17 of them further reported that they used all the feeds i.e. kitchen feeds like soups, commercial formulas, milk and porridge. Three (4%) indicated that they used commercial formulas (Figure 3.8).

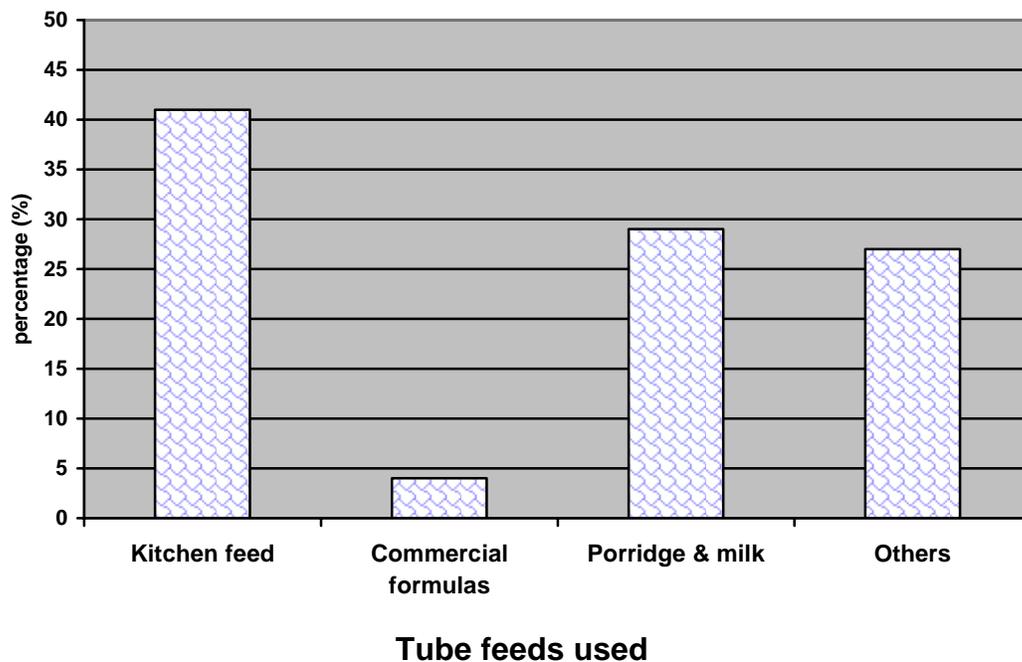


Figure 3.8: Type of feeds given to hospitalized patients on tube feeds.

3.5.5 Nutritional Care of Disabled Patients

This question, **“Do you think you have time to administer diet therapy to patients in need of special care e.g. disabled”** was designed to determine whether patients with disability or those who were too sick to feed themselves were normally assisted with feeding. The majority of the nurses, 58 (68%) reported that sometimes they got time to assist patients with feeding, 22 (26%) noted that they always had time to assist patients, 4 (5%) indicated that they were too busy to assist patients with feeding, while 1 (1%) who noted other reasons, did not specify the reasons.

3.5.6 Nutritional Care of Patients

This question **“How do you think nutritional care of patients can be improved?”** intended to determine the registered nurses’ views on how nutritional management of patients can be improved. The majority 64 (72%) of the respondents noted that a multidisciplinary approach was needed in the

management of patients, 16 (18%) indicated that the nutritional care of patients could be improved if the catering staff were not only left to serve the patients but they should also assist patients with feeding. Six percent however noted that the nutritional care of patients could be improved by feeding the patients well, while 4 (4%) indicated other reasons. Of the 4 that noted other reasons, 3 felt that in order for the nutritional status of patients to improve, the dietitians'/nutritionists' should take the active task of feeding patients to reduce the nurses work load while one respondent indicated that by giving health talks to the patients, their nutritional status would be improved.

3.6 COMPARISON BETWEEN KNOWLEDGE, ATTITUDES AND PRACTICES

3.6.1 Knowledge versus Attitudes

The mean knowledge scores (number of correct answers out of the 13 knowledge questions) for each of the registered nurses and their responses to the statements indicating their attitudes, were compared to determine whether differences were statistically significant. The mean knowledge scores and attitudes did not differ significantly (Table 3.4). With regard to who was responsible for assessing the nutritional status of surgical patients, it seemed that those who had negative attitudes also had lower knowledge scores. On the contrary those with negative attitudes towards nutritional support being provided in the surgical unit tended to have higher knowledge scores than those with positive attitudes. The same applied to attitudes towards importance of assessing the nutritional status of every patient admitted to the ward.

Respondents who either agreed or strongly agreed to the importance of weighing patients upon admission and nutrition playing an important role in the prevention and treatment of diseases, or considered nutritional therapy to be important before surgery tended to have higher knowledge scores than those who disagreed or strongly disagreed. Furthermore, the respondents who felt

nutritional education was not the responsibility of the nurse had lower knowledge scores compared to those who felt nutritional education is the responsibility of the nurse.

Table 3.4: The comparison between mean knowledge scores and attitudes of the registered nurses' regarding nutritional management of surgical patients.

Attitude statements	The mean knowledge scores				P value [†]
	Strongly agree	Agree	Disagree	Strongly disagree	
Nurses responsibility to assess nutritional status of patients.	7.35	7.66	7.31	6.57	0.63
Dietitian's/Nutritionist's responsibility to assess nutritional status of patients.	7.38	7.64	-	5.0	0.26
Doctor's responsibility to assess nutritional status of patients.	7.88	7.47	6.57	6.71	0.43
Nutritional support should be provided in the surgical ward.	7.04	7.33	8.0	7.40	0.46
Important to assess nutritional status of every patient admitted to the ward.	7.46	7.23	-	8.0	0.84
It is important to weigh every patient upon admission.	7.26	7.83	6.60	-	0.37
Nutritional education is not the responsibility of the nurse.	-	6.94	7.60	7.46	0.59
Nutrition has an important role in preventing disease.	7.57	6.38	-	-	0.07
Nutrition has an important role in treating disease.	7.51	7.40	6.0	-	0.51
Nutritional therapy before surgery is important.	7.48	7.48	6.0		0.42
Disabled patients should be given special attention during meal times.	7.59	6.68	7.65	9.0	0.15
Nurses are very knowledgeable in nutritional matters.	6.75	7.74	7.32	7.33	0.40

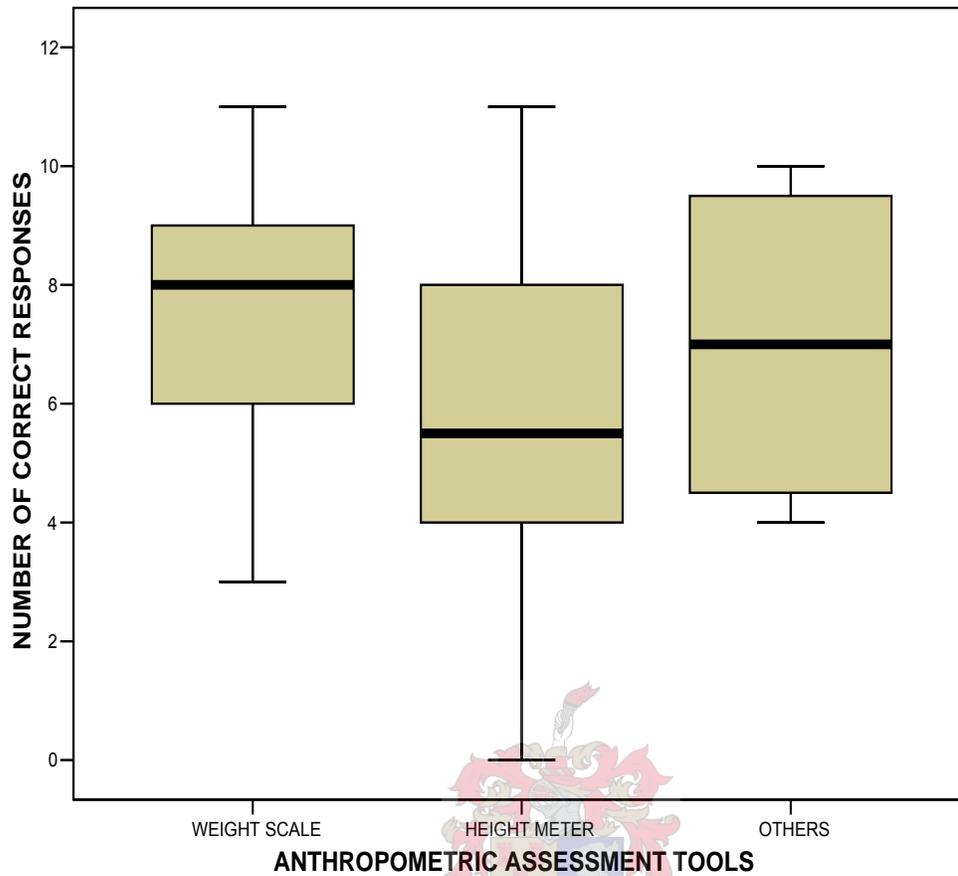
[†] ANOVA (F-Test)

3.6.2 Knowledge versus Practices

The mean knowledge scores were also compared to the nurses' practices. A significant difference in mean knowledge levels was found between the three groups ($p=0.035$, F-test) namely, those that used the weighing scale or the stadiometer and those that used other anthropometric measurement tools. The residuals were checked for normality and they were found to be normally distributed, therefore no non-parametric testing was necessary. A Bonferroni multiple comparisons procedure of the knowledge levels between the 3 anthropometric measurement tools revealed the following differences: the registered nurses who used the weighing scale as an anthropometric assessment tool had a higher knowledge score of 59% [mean of 7.71 correct answers (95% confidence interval [CI], 7.18 – 8.24)] when compared with those that used the stadiometer [45% mean of 5.91 correct answers (95% confidence interval [CI] 4.65 – 7.18)], (Bonferroni corrected p-value $p=0.032$) (Figure 3.9).

3.6.3 Attitudes versus Practices

The attitude statements were compared to the practice questions to establish whether there was any significant relationship between the registered nurses' attitudes and their nutritional practices. In general, no significant differences were found between the attitude statements in comparison to the practices of the registered nurse.



The nature of these Box-plots is as follows; the middle line is the median, the box indicates 25% and 75% quartiles and the whiskers the minimum and maximum values.

Figure 3.9: Comparison of registered nurses' knowledge scores and the anthropometric assessment tools used.

CHAPTER 4: DISCUSSION



4.1 DISCUSSION

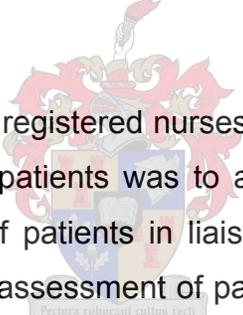
It is apparent that there has been too little emphasis on clinical nutrition during nurses training in hospitals in the past^{2-3, 45}. This inadequate nutrition education has persisted in the current undergraduate nursing curricula in Kenya⁴⁷⁻⁴⁹. The findings of the present study confirm that nutrition training at nursing colleges is obviously lacking since it was reported that registered nurses received only between 4 hours and 8 months of nutrition training and very few had further training in this field. This lack of training is reflected in the registered nurses' average nutrition knowledge score (mean 57%), especially regarding the clinical nutrition aspects (mean score 53%).

With this in mind, it was contradictory to find that 74% of the registered nurses had the opinion that they were knowledgeable about nutrition. Although not statistically significant, those who indicated that registered nurses were knowledgeable had a lower mean knowledge score. It was also evident that their knowledge did not always lead to positive attitudes or correct practices. It is also interesting to note that although not statistically significant, lower mean knowledge scores were linked to more negative attitudes towards the registered nurse's responsibility regarding nutritional status assessment, nutritional management of the patient and nutrition education.

Although the general performance regarding the mean knowledge score of registered nurses regarding basic and clinical nutritional aspects was graded as average, their performance in some topics was better than in others. Questions on energy content of foods, nutrient metabolism, feeding routes and choice of nutrient administration had the highest incorrect responses. Nurses had adequate knowledge on issues regarding food safety, metabolic requirements, energy requirements and sources of nutrients as well as micronutrient supplementation requirements in surgical patients. The question regarding food safety had the highest score (90%) while those on energy value of nutrients had the lowest score of 14%. These findings are consistent with a survey on British

nurses' knowledge of nutrition nursing care which found that without a good knowledge base, nurses cannot provide appropriate nutrition care⁷.

The registered nurses felt that nutrition is important in the prevention and treatment of diseases. However, they felt that nutritional status assessment was not their responsibility but rather that of the dietitians'/nutritionists' or doctors'. In places where dietitians'/nutritionists' services are not available, as is common in most hospitals in Kenya, nurses will tend to fully depend on the doctors for guidance as far as nutritional management of patients is concerned. Doctors however, may not have the adequate knowledge and skills as their knowledge on nutrition has been shown to be poor⁴¹. In these cases therefore most patients' nutritional care tends to be overlooked as it has long been recognized that nutrition training in the medical curricula has been haphazard, ambivalent and far from adequate⁴².



Even though the majority of the registered nurses indicated that their main role in the nutritional management of patients was to assist patients with feeding and assess, the nutritional status of patients in liaison with the dietitian/nutritionist, some felt that nutritional status assessment of patients was not the responsibility of the nurse but that of the dietitians'/nutritionists'. The registered nurses also indicated that feeding patients should be delegated to the catering staff. This study has shown that nurses do not have time to administer diet therapy to patients, a finding that is in agreement with that of a study done in Royal Adelaide Hospital, in Australia which indicated that nurses actually delegated their work to the auxiliary staff⁴. By delegating the nursing work to the auxiliary staff, the nurses will not know what the patients have been fed on, or be able to estimate how much the patient consumed because the auxiliary staff is not expected to document the patients feeding details. Such lack of clinical data availability would be expected to adversely affect the nurses' report on patient's progress to the other health professionals like doctors and dietitians/nutritionists, thereby compromising patient care and thus possibly contributing to the high prevalence of malnutrition in hospitalized patients.

Despite the fact that almost all of the registered nurses indicated that they thought it was important to assess nutritional status and weight on admission, less than half of them actually reported doing so all the time. Although it was reported that weight, height, BMI and dietary history were taken, it was found in a follow-up question, that only weight measurements were actually done. In any case, the majority of the nurses who weighed patients did so for medication rather than nutritional status assessment purposes. The measurement of height and weight and derivation of BMI often relies on the willingness of the nurse to comply. The lack of compliance may be due to a lack of insight into the need to record such data. It may also be simply that the necessary equipment is not available in clinics or at ward level. Furthermore equipments which are present may not be regularly calibrated or maintained²⁰.

The nutritional status and nutritional management of surgical patients was reportedly not discussed on ward rounds, but patients were often referred to dietitians/nutritionists. The main suggestion for improvement of the nutritional care of the patients was to implement multidisciplinary care. It has been noted that once a patient is identified as nutritionally vulnerable, management strategies should be planned and implemented by nurses in partnership with dietitians/nutritionists, doctors and other health professionals⁵⁰.

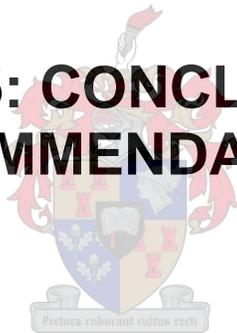
The quality of food given to hospitalized patients especially on tube feeds may compromise their clinical outcome. The quality of tube feeds as assessed in this study was inadequate. The majority of the patients who were on tube feeds were fed on kitchen made tube feed (KMTF). KMTF have been reported to be bacteriological unsound and, depending on the ingredients used, nutritionally incomplete. Bacterial contamination is a major factor for nosocomial infection and is not recommended for hospital use⁵¹⁻⁵³. In this regard, a study done by Adami *et al* on patients (n=15) who underwent a total laryngectomy showed that patients fed on KMTF had a higher local infection rate (86%) compared to controls (33%). Infections with diarrhoea was also higher on patients on KMTF

(71%) compared to controls (7%). Fever days were higher (57%) compared to controls (13%) and patients fed on KMTF suffered from abdominal discomfort (86%) compared to the controls (13%)⁵⁴. Studies have also showed that KMTF do not meet international recommendations as they have been shown to be inadequate in micronutrients, vary in their nutrient content, and contain detrimental nutrients like, cholesterol gluten, purine, lactose and have been reported to be heavily contaminated⁵¹.

Although the registered nurses agreed that disabled patients should be assisted with feeding, the majority did not have the time to do so mainly because of their heavy work load. Inadequate staffing and higher bed occupancy per surgical unit may be one of the contributing factors. Another reason could be the lack of facilities required for nutritional management as well as multitasking and other time consuming practices. This again highlights a discrepancy between the nurses attitudes on what should be done in relation to what they actually do because of a non-supportive environment.

The prevalence of malnutrition in hospitalized patients has been reported to increase from the time of admission, during hospitalization and can be even higher on discharge^{2, 28, 31}. Although many contributing factors have been identified as being responsible for this high prevalence, it nevertheless remains high^{2, 33}. The findings of the present study indicated that one of the major reasons which may contribute to the high prevalence of malnutrition in hospitalized patients may indeed be the lack of commitment of registered nurses towards nutritional management of patients as well as a lack of well set out protocols regarding the role of each health professional towards the nutritional care of patients at KNH, Nairobi, Kenya. Other reasons may be a lack of relevant nutritional knowledge and poor practices towards the nutritional care of patients. In this regard, it remains a grave concern that despite the identified problems in this study, 69% of registered nurses still indicated that the nutritional support provided on ward level was sufficient.

CHAPTER 5: CONCLUSION AND RECOMMENDATIONS



5.1 THE STUDY AND ITS LIMITATIONS

- The comprehensive assessment of the knowledge, attitudes and practices of registered nurses on nutrition was not possible because of the time that would have been required and was unlikely to have been given by the registered nurses as they already complained that the questionnaire used was too long.
- Limitations of the study may also have arisen from the self-reporting method of data collection. There may have been some differences between registered nurses' stated activities and their actual nursing practices regarding the nutritional care of surgical patients, which would only be definitively resolved by observing the registered nurses at work.
- Funds were limited and this forced the researcher to do the survey in only one department in a hospital. The study would have been more beneficial if it covered all medical and surgical divisions not only at KNH but countrywide representing the three major government hospitals situated in the three cities of the country.

The smaller number of registered nurses interviewed from a single department limits the study's application to other situations.

- It was not easy to get the registered nurses to complete the questionnaire as they felt the study was more appropriate for the dietitians/nutritionists.

5.2 CONCLUSION

This study has shown that there is inadequate nutrition training in the nursing curriculum in Kenya⁴⁷⁻⁴⁹. There was lack of continuous nutrition training of registered nurses after college, either at the work place or in conferences.

Although the registered nurses regarded nutritional care of patients as important, their practices seemed to contradict their attitudes. Considering the responsibility the nurses are entrusted with regarding patient nutritional care, the current knowledge, attitude and practices of nurses towards nutritional care is a cause for concern. This multi-practices and inadequate knowledge on nutritional care of patients may be one of the contributing factors to the high prevalence of malnutrition in hospitalized patients.

The findings revealed a need for raising awareness on the importance of nutrition, and on improper practices and problems with nurses' time availability regarding the nutritional care of patients.

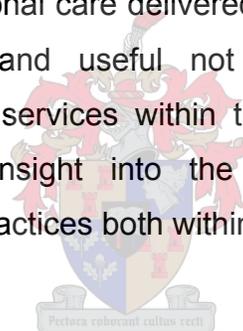
5.3 RECOMMENDATIONS

- 
1. Training of nurses.
 - a. The nursing school syllabus in Kenya should be improved to include more hours of nutrition training as well as incorporate more nutrition courses especially clinical nutrition courses because this forms the basis of hospital nutrition.
 - b. Nurses should therefore organize for continuous nutrition education opportunities in order to enhance their nutrition knowledge.
 2. A greater number of dieticians'/nutritionists' posts should be made available to enhance patients' nutritional care and management.
 3. There is a need for a multidisciplinary approach towards the nutritional management of patients, especially by involving the dieticians too.
 4. More studies to evaluate the knowledge, attitude and practices of nurses should be done in Africa as most of the studies done so far have been

documented in developed countries. Further studies on this subject should also be done on other health professionals, namely doctors and dietitians/nutritionists.

5. The nursing assessment sheets should be revised to include nutritional assessment protocol as this may help to clarify the requirements for a specific measured condition and to incorporate some form of risk assessment score and intervention guide.

6. Nursing care can be improved by improved education and communication. It is recommended that a nursing post with such a mandate be established, and a study be undertaken to document the influence of such a development upon nursing staff and the nutritional care delivered to their patients. Such a study might prove informative and useful not only for the promotion and development of nutritional services within this Hospital Trust, but also for more widely applicable insight into the interactions between nursing knowledge, attitudes and practices both within and between nurses.



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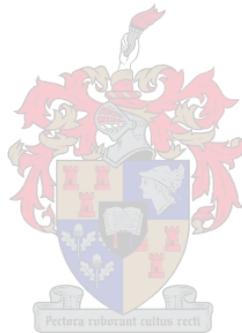
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ADDENDA

Addendum 1: Invitation Letter

To: -----
Ward-----
Surgical Division
Kenyatta National Hospital
Nairobi

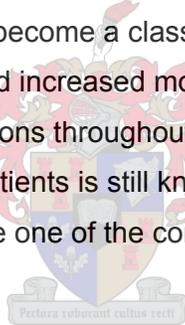
Date:

Dear Sir/Madam

RE: INVITATION TO PARTICIPATE ON A RESEARCH TO ASSESS NUTRITION KNOWLEDGE, ATTITUDES AND PRACTICES OF REGISTERED NURSES WORKING IN THE SURGICAL DIVISION AT THE KENYATTA NATIONAL HOSPITAL.

More than 30 years ago, the plight of the malnourished hospitalized patients was highlighted in a publication that has become a classic. It drew new attention to the relationship between malnutrition and increased morbidity and mortality in surgical patients with acute or chronic conditions throughout the world.

Nevertheless, nutritional status of patients is still known to deteriorate during the length of hospital stay. What could then be one of the contributing factors? Thus the focus for the study above.



I am pleased to inform you that you have been selected to participate in the above study. You are assured that any information gathered from the study will be treated confidentially.

The study will take place between -----to-----, during working hours from Monday to Sunday.

Your assistance will be highly appreciated

Kind regards

Yours truly

Judy Kobe

Clinical nutritionist/Research investigator

QUESTIONNAIRE ON
KNOWLEDGE, ATTITUDE AND
PRACTICES OF KRN WORKING IN
THE SURGICAL DIVISION AT THE
KNH.

SURGICAL UNIT (ward 6A) _____

QUESTIONNAIRE NUMBER (ward 6A 1) _____

THANK YOU FOR TAKING YOUR TIME TO HELP WITH THIS QUESTIONNAIRE.

SECTION A: SOCIO-DEMOGRAPHIC DETAILS

(Please tick where applicable)

1. Gender

A) --Male

B) __Female

2. A) __Age (*in years*) _____

3. What is your highest level of nursing training?

A) __Diploma

B) __Degree

C) __Post graduate

D) __Others (*please specify*) _____

4. Where did you receive your nursing training from?



5. Was nutrition a part of your training in nursing school?

A) __Yes

B) __No

6. If your answer to question 5 is yes, how much time was spent on nutrition training in nursing school? (*Please give your answer in years. If less than a year, give the answer in months*) _____

7. Apart from nursing school training, have you had any formal nutrition training?

A) __Yes

B) __No

8. If your answer to Q7 is yes please specify the topic you concentrated on.

- A) __ Clinical nutrition
- B) __ Community nutrition
- C) __ Basic nutrition.
- D) __ Both clinical and community nutrition.

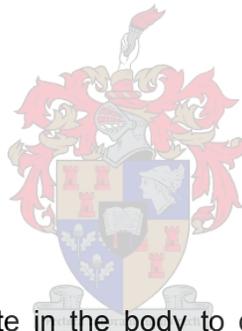
9. What is your work experience in surgical ward?

(Please give your answer in years. If less than a year, give the answer in months)

SECTION B: QUESTIONNAIRE ON KNOWLEDGE.

1. What is the approximate energy value of 1gram of carbohydrate, 1gram of protein and 1gram of fat?

- A) __ $3+6+10=19$ kilocalories.
- B) __ $4+10+10=24$ kilocalories.
- C) __ $4+4+9=17$ kilocalories.
- D) __ $5+5+10=20$ kilocalories.



2. Some vitamins may accumulate in the body to dangerous levels if large doses of vitamin supplements are frequently taken. Examples of this would be?

- A) __ Vitamin B6, B1 and C.
- B) __ Vitamin A, E and D.
- C) __ Vitamin B2, Niacin and C.
- D) __ Vitamin B1 and B12 only.

3. Vitamin C is not involved in?

- A) __ Maintaining healthy gums.
- B) __ Muscle contraction.
- C) __ Strengthening blood vessel walls.
- D) __ Proper wound healing.
- E) __ Increased resistance to infection.

4. Carbohydrates are needed by the body for?
- A) __Glycogen stores and to spare protein for tissue synthesis
 - B) __To insulate the body.
 - C) __To help body fight infections.
 - D) __As body building food.
5. Which groups of food listed below are high in protein?
- A) __ Red beans, Milk, green grams.
 - B) __Milk, chicken, fish.
 - C) __Meat, lettuce, peas.
 - D) __Bread, beef, spinach.
6. The mineral most often at risk of being deficient in the average diet are?
- A) __ Calcium, iodine and iron.
 - B) __Magnesium and sodium.
 - C) __Iron, sodium and potassium.
 - D) __Chlorine and sodium.
7. A person's nutrition requirements increase following trauma or surgery:
- A) __ False.
 - B) __True.
8. Do surgical patients require additional nutrients from the normal requirements?
- A) __Yes.
 - B) __No.
 - D) __ others, *specify*_____
9. How soon can a surgical patient start feeding?
- A) __A patient can stay well nourished for two weeks.
 - B) __Feeding should be resumed immediately after surgery, either orally, enterally &/ parenterally so long as the patient is haemodynamically stable.
 - C) __24hours after surgery.
 - D) __Others, (*Please specify*)_____



10. Should micronutrients be given if the patient cannot feed?

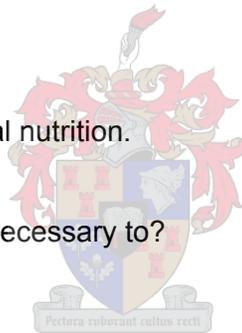
- A) __ Yes, I strongly agree.
- B) __ Not necessary.
- C) __ Others, (specify) _____

11. What is the preferred route of feeding, for a patient with a functional gastrointestinal tract who cannot swallow?

- A) __ Parenteral nutrition.
- B) __ Enteral nutrition.
- C) __ Oral nutrition.
- D) __ Enteral and parenteral nutrition.

12. Patients with high output fistulas of above 500mls should preferably be fed:

- A) __ Orally.
- B) __ Enterally.
- C) __ Parenterally.
- D) __ Both enteral and parenteral nutrition.



13. Refrigeration of some food is necessary to?

- A) __ Kill molds.
- B) __ Stop bacterial growth.
- C) __ Kill bacteria.
- D) __ Keep bacteria from spreading throughout the kitchen.

SECTION C: QUESTIONNAIRE ON ATTITUDE.

1. It is the nurses' responsibility to assess nutritional status of patients.

- A) __ Strongly agree.
- B) __ Agree.
- C) __ Disagree.
- D) __ Strongly disagree.

2. It is the dietitians'/nutritionists' responsibility to assess nutritional status of patients.

- A) __ Strongly agree.
- B) __ Agree.
- C) __ Disagree.
- D) __ Strongly disagree.

3. It is the doctors' responsibility to assess nutritional status of patients.

- A) __ Strongly agree.
- B) __ Agree.
- C) __ Disagree.
- D) __ Strongly disagree.

4. Appropriate and adequate nutritional support is normally provided in the surgical ward.
A) __Strongly agree. B) __Agree. C) __Disagree. D) __Strongly disagree.

5. It is important to assess the nutritional status of every patient admitted to the ward.
A) __Strongly agree. B) __Agree. C) __Disagree. D) __Strongly disagree.

6. It is important to weigh every patient upon admission.
A) __Strongly agree. B) __Agree. C) __Disagree. D) __Strongly disagree.

7. Nutritional education is not the responsibility of the nurse.
A) __Strongly agree. B) __Agree. C) __Disagree. D) __Strongly disagree.

8. Nutrition has an important role in preventing diseases.
A) __Strongly agree. B) __Agree. C) __Disagree. D) __Strongly disagree.

9. Nutrition has an important role in treating diseases.
A) __Strongly agree. B) __Agree. C) __Disagree. D) __Strongly disagree.

10. Nutritional therapy before major surgery is important.
A) __Strongly agree. B) __Agree. C) __Disagree. D) __Strongly disagree.

11. Disabled patients should be given special attention during meal times.
A) __Strongly agree. B) __Agree. C) __Disagree. D) __Strongly disagree.

12. Nurses are very knowledgeable in nutritional matters.
A) __Strongly agree. B) __Agree. C) __Disagree. D) __Strongly disagree.

13. What do you think is the nurse role in various aspects of nutritional management of hospitalized patients? *Please comment.*

SECTION D: QUESTIONNAIRE ON PRACTICES

1. If you were assessing nutritional status of your patient, what criteria

Would you use? Please comment.

- A) __Check the vital signs like blood pressure, pulse rate.
 - B) __Do urinalysis.
 - C) __Weight, Height, BMI, diet history.
 - D) __Others, please specify
-

2. On what proportion of your patients do you carry out nutritional assessment?

- A) __All patients.
- B) __Some patients.
- C) __None. *Comment*_____

3. Do you weigh your patients often on admission?

- A) __yes.
- B) __No.
- C) __We estimate weight.
- B) __Sometimes



4). If your answer to question 3 is C, how do you estimate weight? *Please comment.*

5. If you were to weigh patients, you would do so for what reasons: (*please choose one answer*)

- A) __Because of patients' medical condition.
- B) __Obvious weight loss, and poor appetite/intake.
- C) __Medication purposes.
- D) __Others, (*please comment*) _____

6. Which of the following anthropometric assessment tools do you use in your unit:

- A) __Weight scale
- B) __Height metre/stadiometer
- C) __Waist circumference.
- D) Others, *please specify*_____

7. Do you always discuss Nutritional status and Nutritional Management of patients during ward rounds?

- A) __Always.
- B) __Sometimes
- C) __No

8. If no, what could be the reason, *please comment*.

9. What would you do if you felt that patient was not receiving adequate nutrition?

- A) __Consult the dietician/nutritionist.
- B) __Refer to the doctor.
- C) __Discuss with the patient diet options.
- D) __Others (*Please comments*)



10. What feeds do you normally give your patients on tube feed?

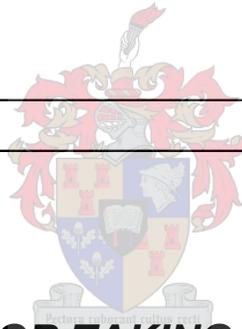
- A) __Kitchen feed i.e. soups.
- B) __Commercial formulas (*Please specify*) _____
- C) __Porridge and milk.
- D) __Others, *specify* _____

11. Do you think you have time to administer diet therapy to patients in need of special care e.g. disabled?

- A) __ Sometimes.
 - B) __ To busy for that.
 - C) __ Always have time.
 - D) __ Others, *please comment*.
-

12. How do you think nutritional care of patients can be improved?

- A) __ By feeding the patients well.
 - B) __ By catering staff serving and feeding the patient.
 - C) __ By doing a nutritional assessment and working closely with the dietician and doctor.
 - D) __ By referring the patient to the doctor.
 - E) __ Others, *please comment*.
-
-



**THANK YOU AGAIN FOR TAKING YOUR TIME AND
TROUBLE TO COMPLETE THIS QUESTIONNAIRE.**

Addendum 3: Informed Consent Form

PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM

TITLE OF THE RESEARCH PROJECT:

Aspects on nutrition knowledge, attitudes and practices of nurses working in the surgical division, at Kenyatta National Hospital.

REFERENCE NUMBER:

PRINCIPAL INVESTIGATOR: Miss Judith Adhiambo Kobe

ADDRESS: P.O.BOX 30467 00100 GPO
Nairobi, Kenya.

CONTACT NUMBER: 0722-742402.

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study staff or doctor any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the Committee for Human Research at Stellenbosch University and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

What is this research study all about?

- *The study will be conducted amongst the Kenya registered nurse,s working in the surgical division at the KNH, and it will involve approximately 160 nurses.*
- *This study simply aims to assess certain aspects of knowledge, attitude, and practices of registered nurses in relation to nutritional therapy of surgical patients in the hospital. The purpose is to identify the needs registered nurses have in relation to nutrition education so that they can care better for their patients and this may reduce the high prevalence of malnutrition in hospitalized patients.*

- *There are no invasive procedures in the study; the study requires that you complete the three questionnaires once and there are no responsibilities expected from you*
- *We will select 160 registered nurses to participate in this study*

Why have you been invited to participate?

- *This study simply aims to assess certain aspects of knowledge, attitudes, and practices of registered nurses in relation to nutritional therapy of surgical patients in the hospital. The purpose is to identify the needs registered nurses have in relation to nutrition education so that they can care better for their patients and this may reduce the high prevalence of malnutrition in hospitalized surgical patients.*

What will your responsibilities be?

- *You only have to fill the questionnaires honestly and accurately and there are no other responsibilities arising from the study,*

Will you benefit from taking part in this research?

- *There are no benefits for yourself arising from the study, however, the results will be used to help nurses improve their knowledge in nutrition and thus help established improved nutritional care for surgical patients in the future.*

Are there in risks involved in your taking part in this research?

- *The completion of the questionnaires does not hold any dangers to you or your health.*

If you do not agree to take part, what alternatives do you have?

- *You will simply be excluded from the study the study without any consequences to yourself or your health.*



Who will have access to your medical records?

- *The information collected will be treated as confidential and the questionnaires you complete will be coded. The code will only be known to the investigator. Results from the study will be published unanimously. You are welcome to ask the investigator for the scores you have achieved in the completion of the questionnaires at any time.*

What will happen in the unlikely event of some form injury occurring as a direct result of your taking part in this research study?

- *This study involves the completion of a set of questionnaires only and as such there is not danger to yourself or your health in any way.*

Will you be paid to take part in this study and are there any costs involved?

- *No you will not be paid to take part in the study but your transport and meal costs will be covered for each study visit. There will be no costs involved for you, if you do take part.*

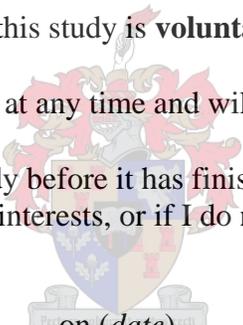
Is there any thing else that you should know or do?

- *You can contact the researcher on 0722-742402 or 020558117 if you have any concerns or complaints that have not been adequately addressed by your study investigator.*
- *You will receive a copy of this information and consent form for your own records.*

By signing below, I..... agree to take part in a research study entitled: - Aspects of nutritional knowledge, attitudes and practices of nurses working in the surgical division at Kenyatta National Hospital.

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurized to take part.
- I may choose to leave the study at any time and will not be penalized or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the study doctor or researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.



Signed at (place).....on (date)..... 2005

.....
Signature of Participant

.....
Signature of Witness.

Declaration By Investigator

I (name) ...Judith Adhiambo Kobedeclare that:-

- I explained the information in this document to
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I did/did not use a translator. *(If a translator is used then the translator must sign the declaration below.*

Signed at (*place*).....on (*date*) 2005

.....
Signature of Investigator

.....
Signature of Witness.

Declaration By Translator

I (*name*)declare that:-

- I assisted the investigator (*name*)..... to explain the information in this document to (*name of participant*)..... using the language medium of Afrikaans/Xhosa.
- We encouraged him/her to ask questions and took adequate time to answer them.
- I conveyed a factually correct version of what was related to me.
- I am satisfied that the participant fully understands the content of this informed consent document and has had all his/her question satisfactorily answered.

Signed at (*place*).....on (*date*) 2005

.....
Signature of Translator.

.....
Signature of Witness.

Addendum 4: Letter of approval to carry out a pilot study in Mbagathi Provincial Hospital

Medical Superintendent
Mbagathi Hospital
P.O. Box
Nairobi

Judy Adhiambo Kobe
Research investigator
Fresenius Kabi Kenya
P.O. Box 30467 00100 GPO
Nairobi.
Cell; 0722-742402.

Date 20 April, 2005

Dear Sir/Madam

RE: PILOT STUDY (RESEARCH PROTOCOL 6.3 PG 15)

Am a student at Stellenbosch University currently pursuing a masters degree on nutrition.

My research title is, Nutritional knowledge, attitude and practices of nurses working in the surgical division at Kenyatta National Hospital.

I would like to do my pilot study on 10 nurses working in the surgical ward in your hospital. All they have to do is fill up a questionnaire and then after a week fill up the same questionnaire. This is to validate the questionnaire as a research instrument so that the necessary changes can be made prior to the main study.

The research will then be carried out at Kenyatta National Hospital.

Attached is my research protocol and my supervisors curriculum vitae including mine.

I am kindly asking you to permit me carry out the above project.
Thank you in advance.

Yours sincerely



Judy Kobe
Research investigator/Clinical nutritionist
Fresenius Kabi Kenya.



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Addendum 5: Research Ethics approval by the Committee of Human Research, Faculty of Health Sciences, Stellenbosch University, South Africa



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY
jou kennisvennoot • your knowledge partner

14 July 2005

Ms JA Kobe
Dept of Human Nutrition

Dear Ms Kobe

RESEARCH PROJECT: "NUTRITION KNOWLEDGE, ATTITUDE AND PRACTICES OF NURSES WORKING IN THE SURGICAL DIVISION, AT THE KENYATTA NATIONAL HOSPITAL"

PROJECT NUMBER : N05/03/055

My letter dated 20 May 2005 refers.

At a meeting that was held on 13 June 2005 the Committee for Human Research ratified the provisional approval of the above-mentioned project.

Yours faithfully

**CJ VAN TONDER
RESEARCH DEVELOPMENT AND SUPPORT (TYGERBERG)**

CJVT/ev

Copy to: Prof D Labadarios



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Fakulteit Gesondheidswetenskappe • Faculty of Health Sciences



Verbind tot optimale gesondheid • Committed to optimal health
Afdeling Navorsingsontwikkeling en -steun • Division of Research Development and Support
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Tel: +27-21-938-9054 • Faks/Fax: +27-21-933-6330
E-pos/E-mail: jdevl@sun.ac.za

Addendum 6: Research Ethics approval by the Kenyatta National Hospital Ethics
Review Committee



KENYATTA NATIONAL HOSPITAL

Hospital Rd. along, Ngong Rd.
P.O. Box 20723, Nairobi.

Tel: 726300-9

Fax: 725272

Telegrams: "MEDSUP", Nairobi.

Email: KNHplan@Ken.Healthnet.org

Ref: KNH-ERC/01/2849

Date: 4th July 2005

Judy Kobe
C/O Stellenbosch University
SOUTH AFRICA

Dear Judy

RE; RESEARCH PROPOSAL: "NUTRITION KNOWLEDGE, ATTITUDE AND PRACTICES OF NURSES WORKING IN THE SURGICAL DIVISION AT KENYATTA NATIONAL HOSPITAL" (50/4/2005)

This is to inform you that Kenyatta National Hospital Ethics and Research Committee has reviewed and **approved** revised version of your above cited research proposal for the period 4th July 2005 to 3rd July 2006. You will be required to request for a renewal of the approval if you intend to continue with the study beyond the deadline given.

On behalf of the Committee, I wish you fruitful research and look forward to receiving a summary of the research findings upon completion of the study.

This information will form part of database that will be consulted in future when processing related research study so as to minimize chances of study duplication.

Yours sincerely,


Prof. A. N. GUANTAI
SECRETARY – KNH-ERC

c.c: Prof. K. M Bhatt, Chairperson, and KNH-ERC
The Deputy Director (C/S), KNH
The HOD, Medical Records, KNH
Supervisors: Mrs.Edna Warentho, Nutrition Dept. KNH