NUTRITIONAL KNOWLEDGE AND DIETARY PRACTICES OFPREGNANT WOMEN RECEIVING NUTRITION EDUCATION WHILE ATTENDING ANTENATAL CARE AT MBAGATHI HOSPITAL NAIROBI COUNTY KENYA

MARYGORRET NELIMA MALOBA

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

2022

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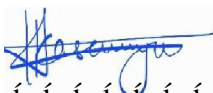
Signature   Date: 28.08.2022.

Professor Wambui Kogi-Makau

Department of Food Science Nutrition and Technology

University of Nairobi

Signatureí í í í í í í í .   Date: 28.08. 2022

Dr Dasel Wambua Mulwa Kaindi

Department of Food Science Nutrition and Technology

University of Nairobi

UNIVERSITY OF NAIROBI

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Registration Number: A56/6750/2017

College: AGRICULTURE AND VETERINARY SCIENCES

Faculty: AGRICULTURE

Department: FOOD SCIENCE NUTRITION AND TECHNOLOGY

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ABSTRACT

Nutritioneducationisoneoftheimportantcomponentsofantenatalcare.Itisawidelyused strategy to improve nutritional knowledge of pregnant women seeking ante natal care more so in governmentrunhealthcarefacilities. A lot of studies to assess the level of nutritional knowledge on pregnant women attending antenatal care in government health facilities have been done but little data exists on the antenatal care situation at Mbagathi hospital given that itøs one of the key government run level five hospital facility in Nairobi County that serves a population of about 3.1 million urban dwellers. The broad objective of this study was to determine the nutritional knowledge and dietary practices of pregnant women receiving nutrition education while attending antenatal care at Mbagathi hospital Nairobi county.

The study used a descriptive cross-sectional study design for collection and analysis of data and. Total of 195 pregnant women receiving nutrition education while attending antenatal care in Mbagathi hospital Antenatal clinic were recruited into the study through systematic sampling. The study, using a semi structured questionnaire, assessed the level of nutritional knowledge and dietary practices of attendees of ante natal clinic. Anthropometric measurement of the Middle-upper arm Circumference (MUAC) was used to assess the nutrition status of the women. The study used Statistical Package for the Social Sciences (SPSS) version 20 software for data entry and analysis. Descriptive statistics (mean, median, frequency and standard deviation) described the background characteristics of the study sample while inferential statistics, (P-Value of <0.05 at 95% confidence interval), were employed to determine associations and relationships between two or more variables.

Majority (69%) of the participants were within the age category of between 21- 30 years and the mean age was 27 (±=5.38) years. Over three quarters (79%) were married while 21% were not. Slightly below half of the women, 43%, had attained secondary education 17% had primary education while 9% had University education. Slightly over a third (35%) were housewives, 31% self-employed and 12% were salaried workers. The mean household size was 3.18 (±=1.47)

Over 50% of the respondents were in their third trimester of pregnancy, 34% in the second and 7% in the first trimester. Only 39% had made between three and four antenatal visits, with the mean number of visits was 3.7. Nearly all (94%) participants had blood pressure readings taken, 71% had a concurrent illness (colds and flus, urinary tract infections,

Malaria), 8% had a diagnosis of High Blood Pressure, 4% had gestational diabetes while 2% had iron deficiency anemia. On assessment of nutritional knowledge, 84% displayed adequate levels of nutrition knowledge with regards to aspects of nutrition during pregnancy like variety of foods; amount of food during pregnancy; energy sources; micronutrient supplement for pregnant women, necessity for supplementation and duration; micronutrients, iron and calcium and consequences of deficiency during pregnancy while 13% had poor knowledge score. The level of nutritional knowledge was strongly associated with the number of antenatal care visits attended (p=0.03), nutrition status (p=0.018) and the mean dietary diversity score (p=0.03) of the participants. Assessment of dietary diversity showed that having consumed at least five food groups, 63% met the minimum dietary diversity score for women. There was a significant association between household size and dietary diversity score (p=0.033). Majority (65%) of pregnant women from household sizes of 1 to 4 members displayed adequate dietary diversity. However, there was no association between dietary diversity with education status, marital status, occupation and level of income. Nutrition status was assessed by taking the reading of the middle upper arm circumference (MUAC) using an adult MUAC tape. The respondents had MUAC measurement of ranging from 22.8cm to over 30cm, with 62% of the pregnant women had normal nutritional status with a MUAC reading of between 22.8-30.7cm, 27% of the women were obese with a MUAC readings of >30cm while 11% with MUAC reading of <22 cm were underweight.

From the research findings, pregnant women who receive nutrition education while attending antenatal care ante natal care at Level 5 hospitals in Kenya have adequate maternal nutrition knowledge and dietary diversity score. The more the number of ante natal visits a pregnant woman makes, the higher the level of nutritional knowledge.

This study recommends that the Government of Kenya, Ministry of Health and partners should continuously and consistently create more awareness of the existence of antenatal care service and its benefits to pregnant women. Health workers at antenatal clinics should also pay particular attention to underweight and overweight pregnant women since they have poor nutrition knowledge the health workers should go an extra mile to find out why they are unable to make the right food choices

ACRONYMS AND ABBREVIATIONS

ANC	Ante natal care
DDS	Dietary Diversity Score
DDS-W	Dietary Diversity Score for Women
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
IFAS	Iron and Folic acid supplements
KAB	Knowledge Attitude Behavior model
KDHS	Kenya Demographic and Health Survey
KII	KeyInformant Interview
MDD	Minimum Dietary Diversity
MDDS	Mean Dietary Diversity Score
MIYCN	Maternal Infant and Young Child Nutrition
MOH	Ministry of Health
MUAC	Mid-Upper Arm Circumference
WHO	World Health Organization
WRA	Women of Reproductive Age

OPERATIONAL DEFINITION

Antenatalcare-Itøs a form of health care where pregnant women learn from skilled health personnel about proper nutrition during pregnancy, they receive micronutrient supplements and treatment in case of an illness and also learn about healthy behavior during pregnancy. The health care personnel also monitor pregnancy and any danger signs during ante natal visits

Dietarypractices-Dietary practice is defined as a participantøs preference in food consumption or behavior of dietary habits and can be classified as good dietary practice and poor dietary practices

Nutrition Education-This is education given to pregnant women during antenatal care visits about their nutritional needs and requirements in pregnancy. Nutrition education covers variety of topics on maternal nutrition

Nutritionknowledge–Nutritional knowledge refers a pregnant woman understanding on various aspect of maternal nutrition including energy and protein requirements in pregnancy, micronutrient requirements,serving size of food groups, diversity of diets. The purpose of equipping pregnant women with nutritional knowledge is to help them improve their dietary practices in order to meet her nutritional needs together with the needsof the developing baby

NutritionalStatus-This is the state of a pregnant womanøs health that is determined by wrapping a tape otherwise known as an adult MUAC on the left   Middle Upper Arm and reading the circumference in centimeters. The reading is categorized as either underweight (a reading of less than 22cm, overweight (a reading of over 30cm or normal (a reading of between 22-30cm)

Middle Upper Arm Circumference- This is a reading taken on the upper left arm of a pregnant woman in order to determine her nutrition status. The reading is taken in centimeters and categorized as either underweight, normal or overweight

CHAPTER ONE: INTRODUCTION

1.1 Background Information

Globally, the prevalence of malnutrition in women, in all its forms, is still unacceptablyhigh. Malnutrition (underweight, overweight, anemia and short stature) affects millions of women around the globe including during pregnancy and breastfeeding which are periods that are marked by increased nutritional needs

Globally, about 170 Million women (9.1%) are underweight and thrice as many, 610 Million (32.5%) are overweight. Prevalence of Malnutrition among women in Sub-Saharan and South Asia is still very high(UNICEF, 2022)

Ante natal Care (ANC) serves as a major entry point where pregnant women receive education forhealthpromotionandprevention. In2003,WHOrecommendedthatpregnant womenshould attend a minimum of four ANC appointments throughout pregnancy, this was termed Focused Antenatal Care ideally at 16, 24-28, 32 and 36 weeks of pregnancy. One of the important components of ANC is healthpromotionincludingnutritioneducationamongothers(WorldHealthOrganization,2003).

When women attend several ANC visits, they exhibit better nutritional knowledge, attitude and practicescomparedtothosenotattendingmoresoindevelopingcountries(Girard&Olude, 2012).Nutritioneducationisawidelyusedstrategytoimprovenutritionstatusofpregnant women.

One of the major areas that nutrition education focuses on is equipping pregnant women with knowledge that will enable them improve on the quality of their diet, aswell as education on foodtypesandamountofservingsthey needtoconsumetooptimizedietary intake.Deficiencies inmicronutrientse.g. Iron,iodine,calcium,vitaminAandiodinecanleadtopregnancy complicationswhichputthewomanandbaby atrisk.Whenpregnantwomendonot gain adequate weight because of insufficiency in the diet, they stand a risk of pregnancy outcomes like preterm deliveries, babies with a low birth weightand also getting babies with congenital malformations.Apartfromeducationonnutritionalrequirementsinpregnancy,pregnantwomen arealsocounselledondangersofsomelifestylebehaviorsthatmay harmtheunbornbaby such as smoking, alcohol drinking and use of illegal drugs. Women attending ANC also benefit from a nutrition interventionof Iron andfolicacidsupplements(IFAS)asapreventivemeasure against IronDeficiency Anemia and neuraltubedefectsintheunbornchild(WorldHealth Organization, 2014)

Apart from pregnancy monitoring, health care providers at ANC usually midwives, also play

a role in providing nutrition advice to pregnant women during ANC appointments. Studies on whether midwives provide nutrition education in United Kingdom(D.J Lee,2012)and Sweden (A.L. Wennberg, 2014) have revealed that most midwives face challenges in providing dietaryadviceandespeciallytopregnantwomenwithmedicalconditionssuchasdiabetesandalthough they acknowledge that it is part of their duty(J. Arrish,2016).Midwiveshaveattributedthis difficulty to lack of adequate training on Maternal Infant and young Child Nutrition (MIYCN), limited staffing and time constraints.

 TheKenyaFoodandNutritionSecurity Policy (2018)adoptsalifecycleapproachwhichfocuses on the health and nutrition needs of individuals through six stages of human development and physiologicallifecycle.Thenutritionalneedschangewithdifferentphysiologicalstatesand development in terms of specific nutrients, typeøs amounts and varieties of foods. Pregnancy is thefirststageofthelifecyclewherepromotingoptimalmaternalnutritionthroughproper nutrition advice, nutrition education and counseling results to a healthier pregnancy and healthy infants. This sets stage for better nutrition status through the rest of the lifecycle.

When pregnant women enroll for ANC early in pregnancy and make several visits in the course of pregnancy, the health care givers are able to conduct assessments and identify risks and also educate women on maternal nutrition thatis necessary for better pregnancy outcomes. In Kenya allpublichealthfacilitieshaveanantenatalcareclinicforpregnantwomen. The Kenya maternal nutrition guidelinesø topics include: Energy and protein requirements in pregnancy; frequency of meals; micronutrient requirements in pregnancy in terms key micronutrients like iron, zinc, iodine, vitamin A, calcium and folic acid. These are covered in terms of food sources rich in the micronutrients, their importance, consequences of deficiency, risk factors to deficiency, dietary management and micronutrient supplementation programs available. Nutritional assessment covers for: Anthropometric assessment for weight and Middle upper arm circumference measurements on every visit; Dietary assessment to assess food patterns, frequency and variety and factors contributing to inadequate intake and biochemical profile for blood sugar, evaluation for Anemia and urinalysis to check for proteinuria(MOH, 2018)

TheKenyaøs guidelineonfocusedAntenatalcarehasadoptedtheWHOrecommendationofatleastfour antenatalcarevisitsby allpregnantwomen.Despitethisrecommendation,a2008ô 2009survey conductedonhealthfacilitiesin Kenyashowedthat 92%ofpregnant womenwent forantenatal care at least once but only 47% went for four or more visits as recommended by World HealthOrganization.ThelowuptakeofatleastfourANCvisitsrobeswomenoftheopportunity

tolearn about their nutritional needs.

1.2 Statement of the Problem

Malnutrition in all its forms affects women all over the world but its effects are worse during pregnancy period. Malnutrition is influenced by factors like socio-demography, nutritional knowledge and dietary practices of pregnant women(Beyene, 2013)
In an antenatal set up, provision of nutrition education is crucial in improving the knowledge of pregnant women about maternal nutrition

Even though many studies have been conducted in the area of maternal health, no study has been conducted to assess nutritional knowledge and dietary practices of pregnant women receiving nutrition education while attending antenatal care in the study site. The lack of comprehensive information posed the need for this study given that Mbagathi hospital is a level five facility that serves an urban catchment area with a population of 3.1 Million people(KDHS, 2014)

1.3 Justification of the study

Ante natal is important in ensuring the success of a pregnancy. Nutrition education is critical in promotinggoodnutritionstatusduringpregnancyanditinfluencesmaternalandchildhealth outcomes. With adequate knowledge on nutrition during pregnancy, pregnant women can improve their dietary intake to provide proper nourishment to themselves and the developing baby. This study will be useful for the Government of Kenya in implementing policies that will improve provision of nutrition education to pregnant women.The findings of this study will also suffice as a baseline for improving the quality of the National guidelines on maternal nutrition.

1.4 Aim of the study

The s t u d y aimedtocontributetowardsimprovementofprovisionofnutritionaleducationat ANCclinicsinKenya.Usingtheresultsofthisstudy,theexistingpolicies,guidelinesand protocolsofnutritioneducationinpregnancycanbeimprovedtoenhancethequalityofmaternal nutrition care.

1.5 Purpose of the study

Thepurposeofthestudywasto generatedataon the nutritional knowledge and dietary practices ofpregnant women receiving nutrition education while attending antenatal care at Mbagathi

hospital Nairobi county Thegeneratedknowledgeshallhelpthehealthmanagersandother stakeholders to strengthen nutrition education component at ANCs so that pregnant women can gainsufficient knowledgeonhowto stay healthy during pregnancy. Thenewknowledge canbe operationalized to create awareness on barriers that hinder uptake of nutrition knowledge.

1.6 Objectives of the study

1.6.1 Main Objective

To determine the nutritional knowledge and dietary practices ofpregnant women receiving nutrition education while attending antenatal care at Mbagathi hospital Nairobi County

1.6.2 Specific objectives

1. Todescribethesocio-demographiccharacteristicsofthepregnantwomenreceiving nutrition education while attending antenatal care at Mbagathi hospital in Nairobi County
2. To determine the level of nutritional knowledge of the pregnant women receiving nutrition education while attending antenatal care at Mbagathi hospital
3. Toassessthedietary diversity scoreofthepregnant women receiving nutrition education while attendingANCat Mbagathi hospital
4. To assess the nutrition status of the pregnant women receiving nutrition education while attendingAntenatal careat Mbagathi hospital, Nairobi County
5. Todeterminetherelationshipbetween Antenatal care attendances,nutritionalknowledgeand dietary practices of the pregnant women at Mbagathi hospital in Nairobi County

1.7 Research Questions

1. What socio-demographic characteristics influence the nutritional knowledge, dietary diversity and nutrition status of pregnant women receiving antenatal care at Mbagathi hospital?
2. What is the association between the level of nutrition knowledge and dietary diversity of pregnant women in Mbagathi hospital?
3. Is there a relationship between dietary diversity score and the nutrition status of pregnant women attending receiving nutrition education at Mbagathi hospital?
4. Is there a relationship between ANC attendance, nutritional knowledge and dietary practices of the study population?

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

Thischapterwillfocusonoverviewof ANC,nutritioneducationinpregnancy,nutrition knowledgeofpregnantwomen,diet quality ofpregnantwomen,roleofnutritionin pregnancy and nutritional requirements in pregnancy. It also presents the conceptual framework and gaps in knowledge of the reviewed literature.

2.1 Overview of Antenatal Care

Toassurethebest possiblehealthofthemotherandherfetus, variousaspects suchasscreening, counseling, education and treatment are important. This systematic and careful assessment is called antenatal care. In the 20th century, prenatal program was first established in Europe and was mainly for poorwomenlivingindifficultconditionsandits objectivewastoimprovematernalandprenatal outcomes (Sikorski J, 1996).Overtime, aspects of screening for medical problems were introducedtodetectmedicalproblemsduring pregnancy.Asthehealthstatusofthemothersand

pregnancyoutcomesimproved,otherdevelopedcountriesadoptedantenatalcareasmuchas there was no evidence of its exact benefits (Gitonga, 2017).

Over the past two decades, there has been much Progress made to increase access to and use of ANC.Quality ofcarehasalsoimprovedleadingtoareductionindeathsasaresultofpregnancy. Deaths because of complications that come about because of pregnancy are still very high. In 2015, about 303000 women died because of pregnancy related complications, over 2.5 Million babiesdiedbetween0-28daysafterbirth and2.6 millionbabieswereborn dead.Anestimateof about 64% of expectant mothers received prenatal care at least four or more in the course of pregnancy(World Health Organization, 2016).

In the most recent ANC guidelines by WHO, the number of ANC contacts have been increased

from4to8contactsthroughoutpregnancy.Currentevidenceindicatesthatatleasteightcontacts can reduce perinatal deaths by up to 8 per 1000 births compared to the 4 visit model. In the new model,WHOrecommendsthefirstvisitonorbefore12weeksofpregnancy thenfollowup visits,taking placeat20,26,30,34,36,38and40weeksrespectively(WHO,2016).WHO recent guideline also outlines the care that pregnant women should receive during each appointment.Components include; education and counseling on healthy diet and optimal nutrition,preventionofexcessiveweightgain,dangerouslifestylebehaviore.g.useofillegal drugsandsmoking;treatmentandpreventionofMalariaandHIV/AIDS;vaccinationfortetanus and

blood screening; fetal ultrasound; and management of common pregnancy symptoms such as nausea, back pain and constipation. The most recent recommendation concerning nutrition in pregnancyisthedaily IFAStopreventirondeficiency anemia,puerperalsepsis,lowbirthweight, and preterm birth.

Antenatalcareisanimportant toolformonitoring pregnancy andthis can enableearly detection andpreventionofrisksinthecoursepregnancy,many womenindeveloping countriesdonotuse this service. According KDHS (2014) about 6 in 10 women achieved at least four or more pre prenatalvisits,though,aboutonly 20%hadtheirfirstvisitwithin12weeks. In study todetermine utilization of ANC in Delhi, 20% of the study population did not avail to any ANC services at a health facility (Ghosh-Jerath, Devasenapathy, Singh, Shankar, &Zodpey, 2015).

Inasimilarstudy todeterminefactorsaffecting ANCserviceutilizationinHadiya ZoneEthiopia, it was found that 86.3% of the study population used antenatal care. As much as over 80% used theservices,sixintenwomensoughtANCinthesecondtrimester.41.4%ofthewomenattended less than four visits when the recommended number is a minimum of four. (Abosse, Woldie, &Ololo,2010).ANCserviceutilizationinAfricais generally poorwithstudiesshowing thatmost women seek ANC in the second semester and thus are usually unable to attain a minimum of fourvisits as recommendedby WHO.Theseindicatemissedopportunities forinterventionslike IFAS supplementation which is vital in pregnancy.

Componentsofnutritioneducationinpregnancy in the Kenya national antenatal guidelines include;educationabouthealthy eatingand preventionofexcessiveweight gainby keeping physically fit.Excessiveweight gaincanleadto a more than normal birth weight and other complications, in undernourished pregnant women, thefocusofnutritioneducationis onimproving daily intakeofbody building andenergygiving foodstominimizetheriskofsmallfor gestational babies.Nutritioneducationalsoemphasizeon the importance of multiple micronutrient supplementation.Someofthemicronutrient supplements given to pregnant women during ANC visits include daily oral Iron and Folic acid whichhelpstopreventagainst Irondeficiency Anemia,pretermbirth,lowbirthweightand puerperal(www.who.int)Expectantmotherswithapoordietary calciumintakearesupplemented withcalciumtominimizeriskofpre-eclampsia,andmaternalbonedemineralizationand Vitamin A supplementationinpopulationswherevitamin A deficiency isaseveretoprevent night blindness(WHO,2016)Pregnant mothersaddictedto caffeine areusuallyadvisedto reduce caffeineintaketominimizepregnancy outcomessuchasstillbirthsandlowbirthweight.(WHO, 2016)

In June 2013, the government of Kenya introduced free maternal health services that

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included antenatal and delivery care in government health facilities. The aim of this initiative was to reduce neonatal and maternal deaths and also increase antenatal care attendance(Malachi Arunda, 2017)

2.2 Nutritional knowledge of pregnant women

When pregnant women are knowledgeable about nutrition during pregnancy they are likely to make appropriate food choices and also reject food taboos and believe about food that have not been scientifically proven.

According toSzwajceretal(2005)Pregnantwomenacknowledgethatdietisimportantfor growthanddevelopmentofthefetusandaremorelikely tobeconcernedabouttheirnutritionby seeking nutrition advice and modifying their diets. As much as there is a significant association betweennutritionalknowledgeandmaternaldietary behavioranduseofsupplements,sometimes pregnant women do not use their knowledge to improve nutrition dietary practices.

In a study to explore the level of nutritional knowledge of Australian pregnant women, it was found that the women exhibited high knowledge about food safety, dietóhealth relationship and foodsrichinnutrients.They exhibitedlowlevelofknowledgeontopicsincludingmaking everyday food choices, recommended daily intakes of five food groups, serving size, supplementsduring pregnancy,andimportanceofkey nutrientsinpregnancy (Bookari,Yeatman, & Williamson, 2016). In the same study, a high per cent age of the women were not aware of how much calories a gram of fat contains and also foods source high or low in fats, they also didnøt know the salt content of bread.

In a study in Ethiopia to assess pregnant mothersø level of knowledge on Maternal Nutrition in Ethiopia,morethanhalfofthestudy samplecouldnotdefinethewordõfoodö.Thiswas attributedlackofaccesstoinformationaboutnutritionduring pregnancy sincemostofthemwere housewives.Eventhoughthey portrayedhighknowledgeaboutimportanceoffoodduring pregnancy, they had limited knowledge about food source of body building, energygiving and minerals and vitamins sources. The low knowledge level of common food sources could have beenduetolowaccesstonutritioninformationandlowsocioeconomicstatusofthestudy population.

IntheUnitedStates,Downsetal.(2014)soughttofindouthowknowledgeablepregnantwomen werewithregardstonutritionbehaviorsinpregnancy thatcouldcauseexcessivematernalweight gain by conducting an FGD and semi-structured interviews with 30 pregnant women of the 30 participants,65%ofparticipantsreportedthatmany womenhaveinformationonwhattoeat

sparinglyinpregnancy,butareunawareofhowmuchweightshouldbe gainedduring pregnancy. A quarter of the participants felt they lacked adequate knowledge on healthy eating and sought information from online sources as much as some internet information lacked credibility hence wasnotreliable.Previously pregnantwomenreportedfeeling inadequateofnutritioninformation in their subsequent pregnancies because the health care providers had an assumption that they were already informed.

Shubetal.(2013)examinedhowknowledgeablepregnantwomenareonaspectsofnutritionand weight gain during pregnancy. Over a half of the study population were overweight, and 75% of the overweight women were unaware of the recommended weight gain and lacked nutritional knowledge on how to prevent excessive weight gain. Only one third of women had knowledge that healthy nutrition was key to safe weight management during pregnancy. Furthermore, 51% of the women were aware that excessive weight gain in pregnancy could lead to complications such as gestational diabetes.

InAustralia,Bookarietal.(2016)conductedaresearchon326expectantwomeninorderto determinetheirknowledgeofrecommendedmaternalweight gainasper gestationalageof pregnancyanddietary practices.Atleast60%ofthestudy populationwasunawareofthe Australian Dietary Guidelines in pregnancy, indicating that there is unfulfilled need with regard to knowledge of maternal nutrition education. In the same study, over 50% of the participants were in agreement that being aware of how much weight should be gained was õimportantö and over60%ofthestudy populationwereinformedoftheappropriateweighttobe gained;however, only27.6%couldaccurately statetheirexpectedweight gainaccording totheirbody massindex. Bookarietal.'s(2016)findingsagreewithDownsetal.(2014)thatmany womenhave information about what not to eat during pregnancy, but are not aware of recommended weight gain.

2.3 Dietary intake of pregnant women

Goodnutritionduring pregnancy promotesmaternalhealthandfetal growth.According to Rhodri et al (2010)ö, birth outcomes such preterm delivery, infants born with birth defects and health problems e.g. pre-eclampsia have been greatly linked to maternal diet before conception andafterconception(Olafsdottiretal,2006)andgestationaldiabetes(Thomasetal2006). Nutrientintakeinpregnancy playsaroleincognitivedevelopmentandallergicdisordersin childhood (Nurmatovet al, 2011).

A study conducted in Spain to determine the dietary intake of pregnant women, it was found that 74% of the study population excessively consumed total fats even though the main

source however, was Mono Unsaturated Fatty Acids. Nevertheless, Saturated Fatty Acid intake was also noted to be high. In terms of socio demographic, Latin American, young women with less education had the highest proportion of inadequate unsaturated fatty acid and folate after taking supplements because of low intake. With regards to intake of energy giving foods from starches, a higher per cent age of the Spanish women showed inadequate intake. Almost all women in the study had poor vitamin D intake according to the reference values. õWhen taking into account total intake (food plus supplements), the percentage of inadequacy observed was still elevatedö (Rodríguez-Bernal et al., 2013).

 Consuming saturated fat and sugars excessively and lowering consumption of starches has been linked to adverse maternal and infant health outcomes. Expectant women should thus be advised on reducing fat intake, especially saturated and increase intake of unsaturated fatty acids as well as increase intake of carbohydrates from starchy foods such as legumes

Lundqvist et al (2014) compared the dietary intake of pregnant women in early gestation and non-pregnant women found pregnant women reported less intake of total energy, meaning that pregnant women did not adhere to the recommendation on increasing energy intake during early pregnancy. This was however speculated to be due to nausea commonly experienced during the first trimester.

With regards to micronutrients, the dietary intake of vitamin D, iron and Folate among the early pregnant mothers was low. Folate plays a significant role in the fetal synthesis of DNA and RNA, low levels of Folate places risks for congenital malformations in the fetus and the other pregnancy complications.

These findings by Lundqvist et al (2014) on early pregnant women dietary intake contrasts on macronutrient intake on a study done to assess the dietary intake of pregnant mothers in Sheffield, United Kingdom. The participants were pregnant mothers in their early trimester of pregnancy. In this study, intakes of protein, energy and total fat were relatively higher. Intake of specific nutrients like vitamin C, vitamin B2, Folate and calcium was lower in the Sheffield women compared to previous studies in the region. Over 60% of the Sheffield women did not to reach the EAR (Estimated Average Requirement) for energy, Folate, vitamin B2, and iron while 40% failed to meet the EAR for calcium (Mouratidou, Ford, Prountzou, & Fraser, 2006).

A study on Dietary intakes and dietary patterns among expectant women in Northwest China, it was found that the participantsø intake of fats was high; just like in other previous studies was consistent with previous studies in China (Liu FL et al, 2015). The researchers attributed this to change in lifestyle with preference for animal source foods. BlumŁeld et al, 2012 also

noted an increaseinfatintakeabovetherecommendationsamongpregnantwomeninthewestern countries. Excessive consumption of fats leads to too much weight gain which further inłuence maternal and childøs health, predisposing them to the risk of cardiovascular diseases, diabetes, obesity, and metabolic syndrome (Liu FL et al, 2015).

In the same study, vitamin A dietary intake was noted to be lower than the recommended intake among70%ofthestudy participants.Thisindicatesthatmajority ofpregnantwomeninthestudy area had limited access to vitamin A containing foods. A previously conducted study in China,70%oftotal vitamin Awasderivedfrom plant sources,however,in thestudy byLiu et al ,2015meatsandvegetablesaccountedfor67·1%and19·6%,respectively.Thissuggestsa gradual change in dietary habits overtime among the study population. Dietary intake of Folate was also low and this was supported by biochemical results of low Folate concentration among women in the study area (Dang et al, 2014). Among pregnant women in developed countries, it wasfoundthatFolateintakewasbelowtherecommended(Blumfield2013),indicating thatpoor dietary folate intake is a universal problem.

Still in the same study byLiu et al (2015) dietary intake of Calcium was found to be relatively higheralthoughstillbelowtherecommendedintakeofany gestationalperiod. Zincintakewasalso below the recommended intake. It was speculated that absorption of calcium and zinc could be impairedby phytatethatarepresentinthefrequently consumedfoodssuchascereals. Ironintake was significantly higher than average and closer to recommended intake for the third trimester. These results differ from the results obtained from other developed countries where prevalence of iron deficiency is high in pregnancy.

Generally, dietary intake of pregnant women is below the recommended intake. Counseling on sufficientenergy intakeduring theearly phaseofpregnancy shouldbeemphasized.Pregnant women also need to be counselled on excessive energy intake to prevent excessive weight gain. Low intake of micronutrient has also been noted with special regard toFolate, vitamin D and iron. Nutrition educations on the importance of micronutrients need to be emphasized. Pregnant women should be encouraged to start ANC early in pregnancy in orderto benefit from Folate supplementations.

Dietary diversity shouldbepracticedby pregnantwomeninordertoreapmaximumbenefits from locally available foods in order to meet the extra nutrient requirements of pregnancy. The literaturereviewedaboveislimiting inthedietary intakeofbody buildingfoods.Furtherstudies need to be done on consumption of proteins in pregnancy.

2.4 Research Design and methodology

Research study design is a framework, or a set of methods and procedures that are used for collection and analysis of data on variables specified in a particular research problem. The type of study design a researcher uses to answer a particular research question is determined by the goal of research, the nature of question and the availability of resources. The design of a study can affect the validity of its results, so it is important to understand the different types of study designs and their strengths and limitations.(Aggarwal, 2018).

Study designs are classified into descriptive(non-analytical) and analytical study designs. Descriptive studies merely describe data on one or more characteristics of a group or individual. They do not answer questions or establish causal relationships. Examples of descriptive studies include case series, case reports and cross sectional surveys (cross sectional surveys can also be analytical). A descriptive study can be a survey of dietary habits of pregnant women(Aggarwal, 2018).

Analytical studies are studies where the investigator attempts to test a hypothesis or establish a causal relationship between variables. In analytical studies, the investigator assesses the effect of an intervention or exposure of an outcome. This study is classified into observational and experimental studies. Observational studies are where the investigator documents a naturally occurring relationship between the exposure and the outcome. The researcher does not do any intervention and the exposure has already been decided naturally e.g. comparing the antenatal dietary habits of mother with normal and low birth weight babies. The exposure must precede the outcome(Aggarwal, 2018).

Observational studies can either be descriptive or analytical. Examples of observational studies include cross sectional studies, case control studies and cohort studies

A cohort study is where a study takes a forward direction, the investigator starts with determining the exposure to a risk factor and the assesses whether the outcome occurs at a future point in time eg a researcher can follow a group of smokers and a group of non-smokers to determine the incidence of lung cancer in each(Walwyn, 2016).

In cases control studies the researcher takes a backward direction, the investigator starts by determining whether the outcome is present and the traces the presence of prior exposure to a risk factor eg an investigator can identify a group of normal birthweight babies and a group of low birth weight babies and then ask the mothers about their dietary habits during pregnancy.

In interventional studies, the investigator actively performs an intervention either in all or

some participants in a study eg administration of a drug or a vaccine or introduction of an educational tool(Walwyn, 2016).

The most commonly used study design to assess maternal nutrition in pregnant women is cross sectional study design. A study in Ghana to assess nutritional knowledge and dietary habits among pregnant adolescents attending antenatal clinic used a cross sectional study design(Prince Kubi, 2021).

A cross sectional descriptive survey was used to collect data on knowledge and attitude of pregnant mothers towards maternal dietary practices during pregnancy in Yaounde(al, 2016)

In a study to assess health and nutrition knowledge attitude and practices of pregnant women attending and not attending antenatal care in Western Kenya, a cross sectional survey was used(Nandita Perumal1*, 2013).

This study used a descriptive cross sectional study design to describe the characteristics of pregnant women attending antenatal clinic at Mbagathi hospital

Unlike case control studies and cohort studies where study participants are selected based on outcome or exposure respectively, in cross sectional studies, participants are selected based on inclusion and exclusion criteria and data is collected at a specific period in time. This study does not involve manipulating variables and allow the researcher to look at numerous characteristics at once and also provide information about what happens in a current population

Descriptive cross sectional studies are inexpensive and fast, the researcher can collect data on different variables at once, they can also provide a useful springboard for further research. Nonetheless, this study design does not establish causal relationships, so it does not allow for conclusion about causation (Levin, 2006).
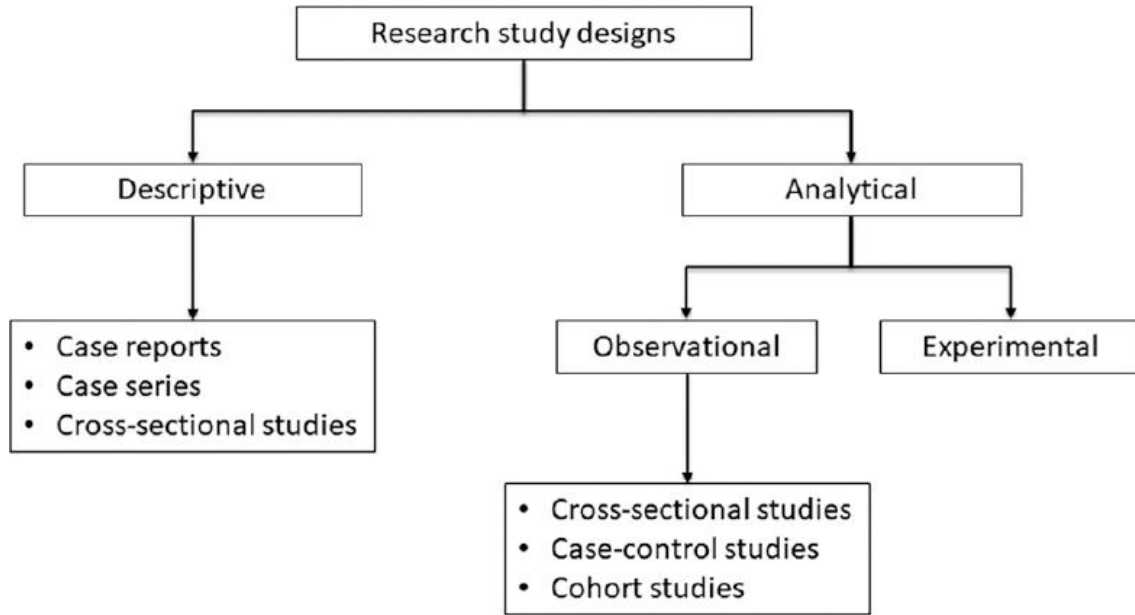
Fig 1: Illustration of research study design

2.4 Gaps in knowledge

Thereisagapinknowledgeaboutwhypregnantwomenareunabletotranslatenutritional
knowledgeintodietarypractices.

This data implies a gap in knowledge on the effectiveness of the nutrition education gained in the process of ante natal care or there are other factors that prevent women from fully utilizing the knowledge gained at the ANC to improve dietary practices.

2.5 Theoretical Framework

ThisstudywilladopttheKnowledge-Attitude-BehaviorModel.Knowledgeisinstrumental when a health related behavior change is required. The model proposes that as one gains more knowledge in a health behavior domain, change in attitude is initiated. Over the same period of timechangesinattitudeaccumulateresultinginbehaviorchange.Themostessentialresourcein this model is accumulation of knowledge which is done by provision of information; however, this model does not specify the process by which change of behavior occurs.

Nutritioneducationisawidelyusedstrategytoimprovenutritionstatusofexpectantwomen seekingprenatalcareingovernmentrunhospitalsespeciallyindevelopingcountries.When pregnantwomenare knowledgeable about nutrition during pregnancytheyare likely to make appropriate food choices and also reject food taboos and believe about food that have not

been   scientificallyproven.WhenwomenattendseveralANCvisits,theyexhibitbetternutritional knowledgeattitudeandpracticescomparedtothosenotattendingmoresoindeveloping   (Girard &Olude,2012).   Severalstudiesrevealthatpregnantwomenaremorereceptivetonutrition information.Pregnantwomenneedtheõhow-to-knowledgesincetheyarealreadymotivated. Thiskindofknowledgeisinstrumentaltohelpthemadoptahealthfuldietthatwillhavepositive consequences in the outcome of the pregnancy.

Affects

Leading to change in

| Knowledge | Attitude | Behavior change |

e.g. giving health
knowledge

e.g. health
awareness

e.g. adoption of
Healthy lifestyle
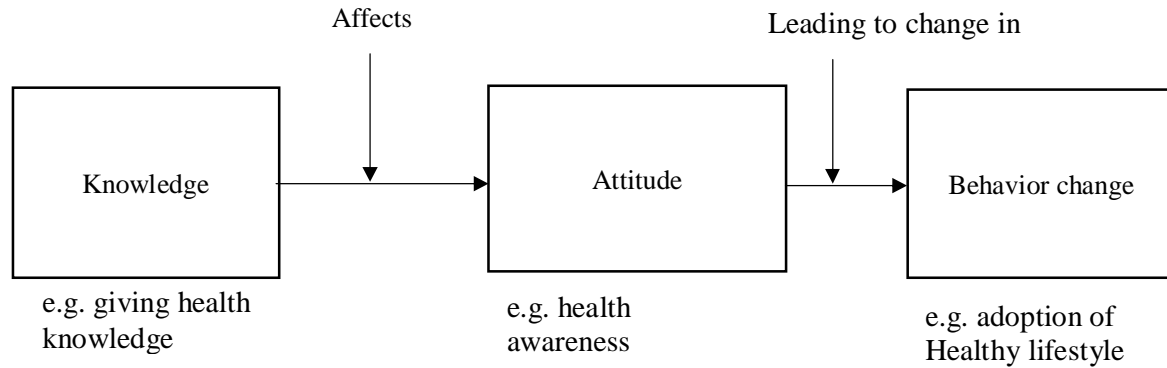
Figure 1: Knowledge-Attitude-Behavior (KAB) model

2.6 Conceptual Framework of the study variables

Independent variables		Dependent variables
Nutrition Education ˅ Exposure to nutrition education at ANC ˅ Frequency of exposure ˅ Availability of nutrition education materials relevant for pregnancy ˅ Knowledgeability of health care providers on MIYCN ˅ No. of ANC appointments attended	←	Nutritional knowledge level of the pregnant women
	←	Dietary practices of the pregnant women
	←	**Socio-demographic characteristics** ˅ Age ˅ Education level ˅ Occupation

Figure 2: Conceptual framework derived from study objectives

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.1 Study Design

A descriptive cross-sectional study design was used in this study. In a cross-sectional study design, the researcher measures the outcome and the exposure in the study participants at the same time and may also study their associations. The participants are selected based on the inclusion and exclusion criteria set for the study. Data was collected in the month of October and November 2021. The study sought to find out the Nutritional knowledge and dietary practices of pregnant women exposed to nutrition education while receiving antenatal care. A structured interview questionnaire was used for data collection.

3.2 Study site and Population

3.2.1 Study site

This study was done at Mbagathi hospital in Nairobi County specifically at the Antenatal Care Clinic.Mbagathi Sub-county hospital is a public level 5 health facility under the County government of Nairobi Department of Health service. The hospital serves an urban catchment area with a population of 3.1 Million of which 22% leave below the poverty line(KDHS, 2014).

Services offered at Mbagathi include; Medical training, special clinics, family planning, immunization, antiretroviral therapy, HIV counseling and testing, curative in-patient and outpatient services among others.
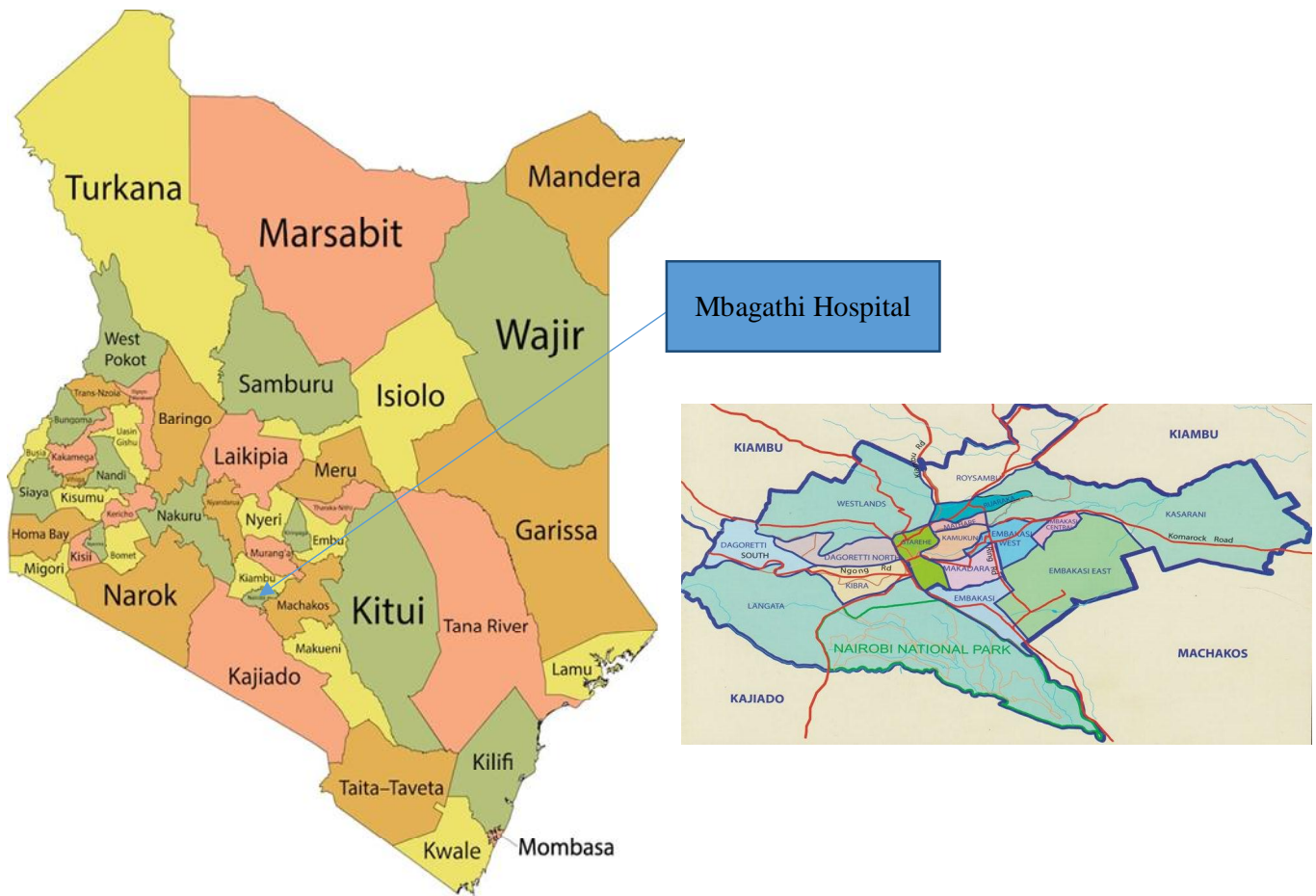
Figure 3: Map of Kenya showing Mbagathi Hospital

3.2.2 Study population

The study population consisted of pregnant women receiving nutrition education while attending antenatal at Mbagathi Hospital between the periods of 1st October 2021 to 31st November 2021.

3.3 Sample size

3.3.1 Sample size determination

The sample size was calculated using the Fischer et al., (1991) formula as follows:

$$N = (Z2pq)/ d^2$$

Where:

N- Desired sample size

z-The standard normal deviation set at 1.96 of the 95% confidence interval

P-Prevalence of antenatal care attendance at Mbagathi hospital is at 85% (MOH, 2015)

q- Proportion of ANC attendance is (1-p) = (1-0.85) =0.15

d-The degree of accuracy desired set at 0.05 significance

Therefore, N= (1.96) 2(0.85*0.15)/0.052=195

The study sample was therefore 195 pregnant women

3.3.2 Sampling procedure

Mbagathi Hospital was purposively selected since it is the largest hospital in the sub County that serves the rest of the population in the County thus more representative.

The sample for the study was selected using systematic random sampling

```
┌──────────────────┐        ┌──────────────────┐
│  Nairobi County  │ ─────▶ │ Purposive Sampling│
└──────────────────┘        └──────────────────┘
         │                           │
         ▼                           ▼
┌──────────────────┐        ┌──────────────────┐
│ Mbagathi Hospital│ ─────▶ │ Purposive Sampling│
└──────────────────┘        └──────────────────┘
         │                           │
         ▼                           ▼
┌──────────────────┐        ┌──────────────────┐
│ Antenatal Clinic │ ─────▶ │ Purposive Sampling│
└──────────────────┘        └──────────────────┘
         │                           │
         ▼                           ▼
┌──────────────────┐        ┌──────────────────┐
│ 195 Respondents  │ ─────▶ │ Systematic Random │
│                  │        │     Sampling      │
└──────────────────┘        └──────────────────┘
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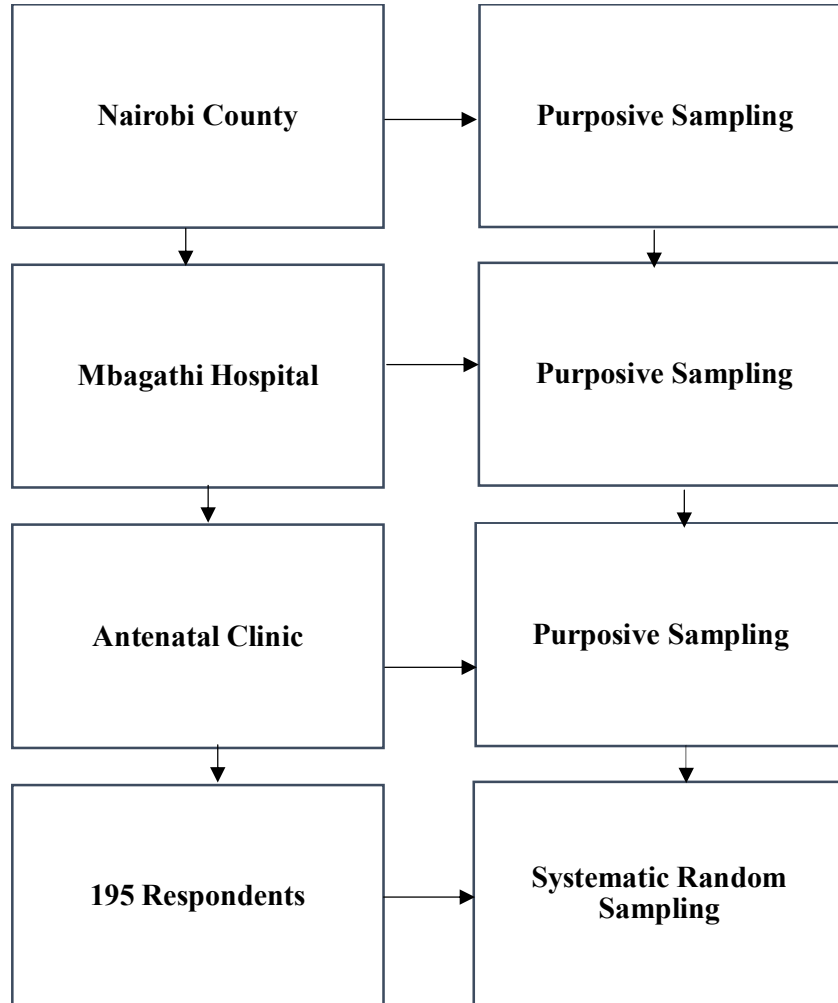
Figure 4: Sampling frame for study site and study population at Mbagathi hospital

3.3.3 Inclusion criteria

Participants included in this study were pregnant women receiving nutrition education while attending antenatal care visit at Mbagathi hospital who voluntarily consented and agreed to participate in the study

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3.3.4 Exclusion criteria

Pregnant women with ill health, complications, abnormal fetus, and those who did not voluntarily consent to the study

3.4 Data collection tools and procedure

A semi-structured questionnaire was used for data collection

3.4.1 Study Questionnaire

The researcher developed a semi structured questionnaire to be used for data collection. It was divided into three parts: The first part introduced the questionnaire and briefly explain its purpose. The second part gave instructions on how to answer questions and part three covered questions regarding the independent variables: socio-demographic context, test of knowledge about nutrition in pregnancy and dietary practices of the pregnant women. Coded options were

given for the questions.

3.4.1.1 Socio-demographic characteristics

Questions in this section sought to determine the socio-demographic context of the pregnant women. These included; age, marital status, education status, average monthly household income occupation, gestational age, religion and family size. This information enabled the researcher to understand the background of the respondents and also to find associations with other study variables.

3.4.1.2 Test of nutritional knowledge

Maternal nutritional knowledge was assessed using a set of questions that comprised 15 multiple choice questions that captured their understanding of various aspects of nutrition during pregnancy. This questions reflected the topics covered during nutrition education sessions women as stipulated in the Kenya national guidelines for antenatal care during .The test assessed the mother's knowledge on: variety of foods; amount of food during pregnancy; energy sources; micronutrient supplement for pregnant women, necessity for supplementation and duration; micronutrients, iron and calcium and consequences of deficiency, fetal complications of maternal under nutrition; knowledge on food safety and lifestyle behaviors to avoid during pregnancy.

The respondents selected a response to each question among the choices given. The questions were marked on a scale of 1-15. Each correctly answered question was awarded one mark. All the scores for the right answers were summed and a total score out of fifteen given. Respondents who correctly answered at least ten and above were scored as having adequate nutritional knowledge; those who correctly answered between nine and six questions were scored as having average knowledge and those who scored five and less had poor knowledge (MOH, 2018)

3.4.1.3 Dietary practices

The test will assess the respondentsø dietary adequacy, frequency of consumption and dietary diversity. 24-hour recall Dietary practices was assessed using a Dietary Diversity Questionnaire for Women of Reproductive Age (DDS-W) and a questionnaire

Dietary Diversity as an indicator of the quality of the diet and reflected the consumption of individual women. It sufficed as a proxy for macro and micro nutrient dietary adequacy. The study used the FAO recommended cut-off points for Minimum Dietary Diversity for Women (MDD-W) which is made of ten food groups (FAO, 2016).

The assessment involved a simple count of food groups that a participant had consumed over the preceding 24 hours before the survey. The indicator of Dietary Diversity that is the Dietary Diversity Score (DDS) was calculated by summing the number of food groups consumed by the respondent over the 24-hour recall period. These food groups include: Grains (maize, wheat, millet and all products made from these and their flours); white roots and tuber (cassava, yam, sweet potatoes, beet, Irish potatoes and others not in the list); pulses (beans, peas and lentils); nuts and seeds (pumpkin seeds, groundnuts, sunflower seeds, chia seeds, sesame seeds and others); Dairy (fresh milk, fermented milk, yoghurt, cheese); Meat, poultry and fish; Eggs; Dark green leafy vegetables (cassava leaves, pumpkinleaves, amaranth, managu,kales, spinach); other vitamin A rich fruits and vegetables (ripe mangoes and papayas, oranges, passion fruits, melons carrots, pumpkins other vegetables (fresh peas, green beans, tomatoes, cucumber, zucchini, onions, mushrooms) and other fruits(wild fruits, ripe bananas, guava, figs, lemon, lime)

Participants who had consumed at least five of the ten food groups in the 24-hour recall were considered to have met the MDD-W

The 24- hour recall questionnaire was also used to assess the actual intake of individual foods. The respondents were asked to recall and report all foods and beverages consumed over the preceding 24 hours. The recall started with the first thing the respondents ate in the

morning until the last food consumed the next morning. The steps involved in the 24-hour recall involved asking the respondents to give a list of all foods and beverages consumed during the previous 24 hours, they were then probed for foods probably forgotten during the listing, the time each food was consumed, the quantity consumed and anything else that was consumed.

3.5 Recruitment and Training of Research Assistants

The study recruited five assistants with at least a certificate in Nutrition and Dietetics and experience in data collection. They administered the questionnaires and carried out direct observation. Prior to the survey, the researcher trained the assistants. The training sessions covered the purpose and objectives of the study; a thorough review of each item on the questionnaire; how to conduct an interview (role play was used for the enumerator to practice questionnaire administration) and the expected code of conduct of a researcher during an interview. After the training session, the researcher and the assistants pre-tested the questionnaire, modifying it accordingly and thereafter prepared a work plan for the execution of the study.

3.6 Pre -Test of the Data Collection Tools

The questionnaire was pre-tested at Westland Health Center. The purpose of pre-testing was to check if the questions was clear, could be understood by the respondents and if they aligned with the purpose and objectives of the study. Ten percent of the study sample formed the sub sample for pre-testing the questionnaire. The observation checklist was tested on the care providers at the ANC clinic. The researcher explained the purpose and objectives of the study to the participants of the pre-test activity and obtained their consent to participate in the study. The questions were read out to the respondents. After the end of the session, the research team held a meeting to share experiences and any challenges encountered and how they could be resolved in order to make the actual study run smoothly. Screening of the filled in questionnares was done to assess for completeness. The research went through the recommendations made by the pre-test sample and used them to improve the questionnaire.

3.7 Ethical and Human Rights Consideration

Before commencement of the study, the researcher obtained approval of the study from University of Nairobi and Kenyatta National Hospital Ethics and Research Committee (UoN-KNH ERC). The researcher obtained permission and clearance to carry out the study from

the In-Charge at Mbagathi hospital. Each respondent received an explanation about the study and informed consent obtained before commencing interviews. The consent form included information such as; the title, purpose and objectives of the study, invitation to participate in the study, benefits and risks of participating and an assurance of confidentiality in handling all the information throughout the study. The questionnaire was coded to ensure anonymity of the respondents.

3.8 Data analysis and Quality Assurance Procedures

All data collection tools were pretested to ensure clarity and alignment to the study objectives. The principal investigator trained the research team on all study procedures, how to administer the study tools, interviewing techniques and how to collect good quality data. At the end of each interview session, the questionnaire was screened to ensure they were completely filled by the respondent. Before data analysis, all data was cleaned and in the event of any missing data, the respondents were contacted for clarity.

Data entry was done using SPSS version 20 software. The socio-demographic characteristics were described using statistics such as mean mode, frequencies and standard deviations.

Inferential statistics: Fischerøs Exact, Confidence Interval, P-Value, Spearmanøs Correlations were employed for data analysis.

CHAPTER: FOUR RESULTS

4.1 Socio-demographic characteristics of the respondents

About 69% of the study participants were within the age category of 21-30 years, and 23% were over 30 years while 8% of the participants were below 20 years. The mean age was 27 (±5.38) years with a range of 17 to 41 years.

Majority of the respondents (79%) were married while 21% were single or not married

Nearly half (43%) of the participants had attained secondary education, 30%, 17% had completed only primary education. and 9% had obtained college and university education,

Majority of the study participants (35%) were housewives, 31% made a living through self-employment,12% were salaried workers while 5% were casual laborers. Slightly below half of the respondents (46%) had not given birth before (first pregnancy), 32% had one child, and 10% of the respondents had 3 to 4 children.

Majority of the respondents (69%) had up to 3 persons living within a household, 24% of respondents had a household of between 4 to 5 persons while 8%had a household size of over 5 persons. The mean household size was 3.18 (±= 1.47).

About a quarter (25%) of the respondents earned an income of between Kshs 5000-1000 while 18% and 15% of the study group earned an income of between Kshs 25001-50000 and Kshs10001-25000. Only 6% of the women earned less than Kshs 5000 while 22% did not know how much income they earned.

About 32% spent between Kshs 5,000-10,000. Only 3% of the household spent over Kshs 50,000 a month, 24% of the respondents were unable to state how much money they used on expenses on a monthly basis, another 2% refused to disclose their monthly expenditure. Concerning religion, the most predominant religion (65%) among the respondents was protestant while 34% were catholic and 1% were Muslim and traditionists.

Table 1: Demographic characteristics of the respondents attending antenatal care at Mbagathi Hospital

Demographic characteristic n=195	Number	Percent
Age		
21-30 years	134	69
below 20 years	16	8
over 30 years	44	23
Marital status		
Married	155	79

Demographic characteristic n=195	Number	Percent
single/never married	40	21
Education status		
Secondary education	84	43
College	59	30
Primary education	34	17
University	17	9
No education	1	1
Occupation		
housewife	69	35
self employed	61	31
Salaried employee	30	15
other(specify)	26	13
Casual laborer	9	5
Number of children		
0	90	46
1	63	32
2	23	12
3 to 4	19	10
Household size		
Up to 3	134	69
4 to 5	46	24
over 5	15	8
Income level		
<=5000 Kshs	12	6
Kshs5,001-10,000	49	25
Kshs 25,001-50000	36	18
Kshs 10,001-25,000	30	15
Refused to disclose	8	4
Donǿ know 22		
Household expenses		
<=5000 Kshs	26	13
Kshs5,001-10,000	63	32
Kshs 10,001-25,000	36	18
Kshs 25,001-50000	14	7
>50,000 Kshs	5	3
Don't know	47	24
Refused to disclose	4	2
Religion		
Protestant	126	65
Catholic	66	34
Muslim	2	1
Traditionist	1	1

4.2 Gestational age and ANC attendance of pregnant women at Mbagathi hospital

Over 50% of the respondents were in their third trimester of pregnancy, 34% were in second

trimester while 7% were in first trimester. On the number of visits made, 39% of the respondents had made between 3 and 4 visits to the ANC clinic, 34% had made over four ANC visits while 29% had made 2 visits. The mean ANC visits were 3.7 (±1.65) while the minimum and maximum number of visits were 1 and 9, respectively.

Table 2: Gestational age and ANC attendance of pregnant women attending ANC at Mbagathi hospital

Characteristic	n=195	Percent
Gestational age		
7 to 9 months (3rd trimester)		59
4 to 6 months (2nd trimester)		34
1 to 3 months (1st trimester)		7
Antenatal attendance		
Up to 2		28
3 to 4		39
Over 4		33
Gestational age of first ANC visit		
Between 1 and 2 months		29
Between 3 and 4months		47
At 4 months and above		24

4.3 Medical profile for the current pregnancy of pregnant women at Mbagathi hospital

About 4% of the respondents had a diagnosis of high blood pressure, 2% and 1% had a diagnosis of gestational diabetes and anemia respectively. At the time of study, none of the participants had been diagnosed with fibroids, pre-eclampsia or malaria.

Table 3: Medical profile of the respondents of pregnant women

Medical Conditions Women	Yes	No
	%	%
Hypertension	4	96
Gestational	2	98

Anemia		1	99

4.4 Nutrition education topics taught to pregnant women attending antenatal care at Mbagathi Hospital

Almost half of the respondents (48%) acknowledged to have been informed about the importance of nutrition education by the health worker on their every visit to the clinic, 25% were occasionally provided with information on the importance of nutrition education during visits. Slightly less than two thirds of the respondents (61%) reported to have been taught about the importance of appropriate weight gain during pregnancy on every visit to the clinic, 8% were given information occasionally. Similarly, 61% of the respondents were informed about the recommended   weight gain during all sessions

About 63% were always informed of the reasons for increased nutrient requirements during pregnancy on every nutrition education session, 12% were occasionally taught. Majority of the respondents (69%) were always informed about nutrient rich dietary sources, 13% were occasionally informed. Over 65% of the respondents were regularly given information on the importance of micronutrient supplementation on every ante natal visit, 15% were occasionally taught.

About 57% of the respondents were regularly given guideline for healthy eating in every ANC session, 14% were occasionally informed. Half of the respondents (50%) reported that a health worker took them through the food preparation methods that preserve nutrients and minimize contamination on every nutrition education session while 14% were occasionally taught

Slightly more than half (54%) of the respondents were always educated on the dangers of drugs and substance use during pregnancy while 12% were occasionally taught.

Table 4: Topics taught during nutrition education sessions at Mbagathi hospital

	always		sometimes	not at all
	n=195	%	%	%
Importance of nutrition education during		48	25	27

26

pregnancy			
Relevance of appropriate weight gain during pregnancy	61	11	28
Recommended weight gain during pregnancy	61	8	31
Reasons for increased nutrient requirements during requirements	63	12	25
Locally available nutrient dense foods	69	13	18
Importance of micronutrients supplementation during pregnancy	67	15	17
Issuance of information education material guidelines on healthy eating	57	14	29
Do health care providers address food safety, hygiene and appropriate food preparation methods	50	7	43
Addressing dangers of substance abuse during pregnancy	54	12	33
precaution	45	20	35
Physical distance	46	10	44
Is weight measurement taken during each visit	96	1	3
Is MUAC measurement taken during each visit	92	1	7

4.5 Level of nutrition Knowledge of pregnant women attending antenatal care at Mbagathi hospital

Majority of the respondents (84%) had adequate knowledge on maternal nutrition, 13% had average knowledge while 13% had poor knowledge score (Figure 6).

There was a significant association between the level of knowledge and number of antenatal care visits attended. Among the women who had attended more than four antenatal visits, 76% had adequate knowledge while 9% had poor knowledge. Among those who had attended four antenatal visits, 15% had adequate knowledge while 6% had poor knowledge while among those who had attended three antenatal vsits,9% had adequate knowledge while 4% had poor nutritional knowledge (p=0.03)
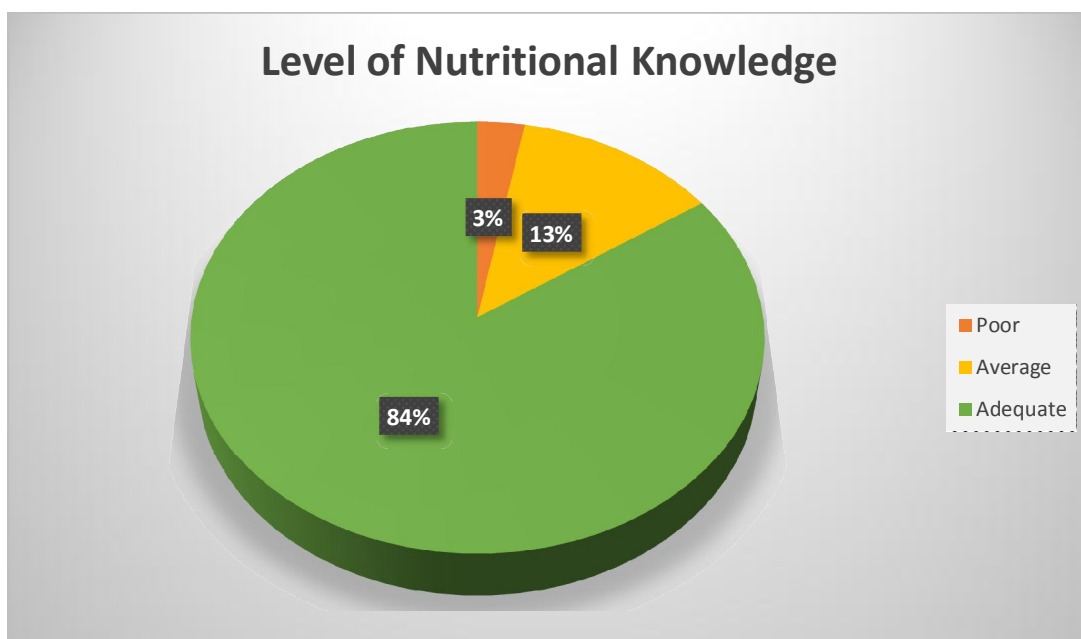
Figure 5: Level of nutritional knowledge of the study participants at Mbagathi hospital

Level of nutritional knowledge of respondents was significantly associated with the nutrition status of the study participants. In the underweight category, 20% had poor knowledge while 6% had adequate knowledge. In the normal category, 56% had poor knowledge while66% had adequate knowledge while in the obese category 18% had poor knowledge while 28% had adequate knowledge (p=0.01)

Table 5: Association between the level of nutritional knowledge and nutrition status(MUAC)

Nutrition status MUAC	poor knowledge n	%	Adequate knowledge n	%	chi-value	p-value
					9.2	0.01
Underweight	15	20	7	6		
Normal	42	56	79	66		
Obese	18	24	34	28		

4.6 Dietary Diversity score of pregnant women attending antenatal care at Mbagathi hospital

Slightly less than two thirds (63%) of the study population consumed at least five or more food groups while 37% consumed less than five food groups within a period of 24 hours (figure 7).
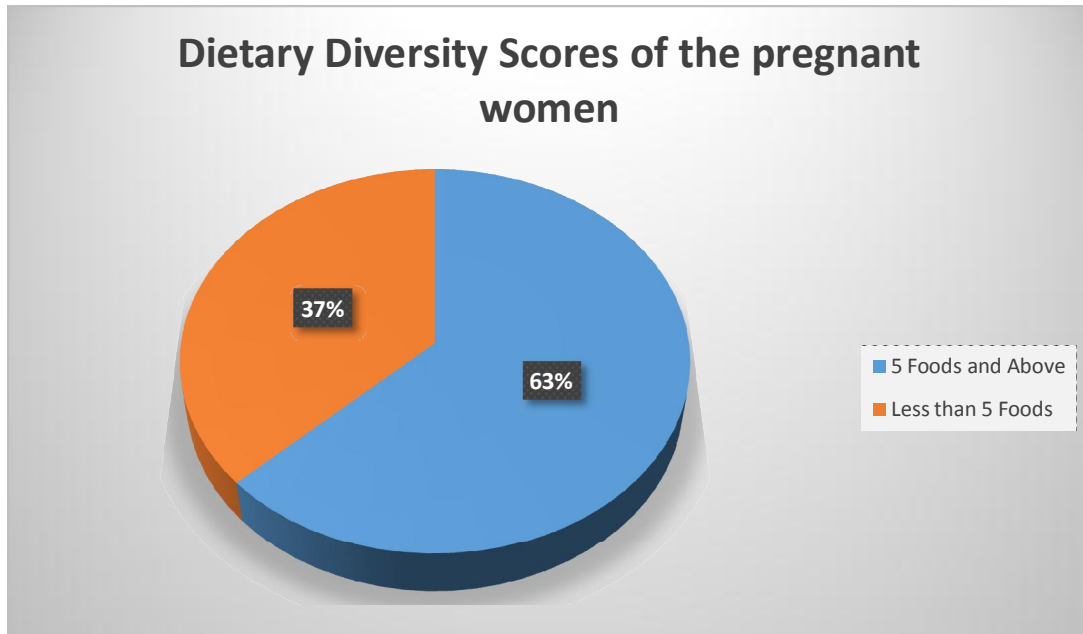
Figure 6: Dietary Diversity Scores of the pregnant women attending antenatal care at Mbagathi hospital

There was a significant association between Dietary diversity score and respondentsø household size (Table 6). Pregnant women from household sizes of 1 to 4 members displayed adequate dietary diversity(p=0.03).

However, there was no significant association between dietary diversity score with other socio- demographic characteristics like education status, marital status, occupation and level of income.

Table 6: Distribution of socio-demographic characteristics by dietary diversity score

Sociodemographic aspects	Inadequate DDS %	Adequate DDS %	X^2-Value	P-value
Education level			6.2	0.18
College	33	29		
No education/Illiterate	1	0		
Primary education	23	14		
Secondary education	36	48		
University	7	10		
Marital status			0.03	0.84
Married	78	80		
Single/never married	22	20		
Occupation			4.9	0.3
Casual laborer	7	3		
Salaried employee	12	17		
Housewife	38	34		
Other(specify)	8	16		
Self employed	34	30		
Household size			0.91	0.033
1 - 4	73	65		
> 4	27	35		
Level of income >Kshs 50,000	5	11	9.1	0.17
Kshs 10,001-25,000	16	15		
Kshs 25,001-50000	18	19		
Kshs5,001-10,000	29	23		
Kshs<=5000	11	3		
Refused to disclose	1	6		
Donøt Know	19	24		

There was a significant association between the level of nutritional knowledge and consumption of 10 recommended food groups for pregnant women. Nutritional knowledge was significantly associated with consumption of dark green leafy vegetablesø (p=0.045) and also consumption of other vegetables e.g. fresh peas, cabbages, green beans, and mushrooms (p=0.008).

There was also a significant association between the level of nutritional knowledge and the mean dietary diversity score (p=0.039).

Table 7: Association between nutritional knowledge and consumption of the recommended ten food groups and the Mean Dietary Diversity score of pregnant women attending antenatal care at Mbagathi hospital

	Low knowledge	High knowledge	N=152	
	%	%	Chi-square	P-value
Starchy staples			2.6	0.114
Never ate	3	16		
Ate	97	84		
pulses			2	0.168
Never ate	42	57		
Ate	58	43		
Nuts and seeds			0.1	0.961
Never ate	84	82		
Ate	16	18		
dairy			0.1	0.905
Never ate	29	30		
Ate	71	70		
Meat poultry fish			0.7	0.427
Never ate	65	55		
Ate	35	45		
eggs			0.1	0.933
Never ate	77	79		
Ate	23	21		
Dark green leafy vegetables			4.1	0.045
Never ate	19	40		
Ate	81	60		
Other Vitamin A rich fruits and vegetables			0.5	0.526
Never ate	26	34		
Ate	74	66		
Other vegetables			7.2	0.008
Never ate	10	36		
Ate	90	64		
Other fruits and vegetables			3	0.085
Never ate	35	54		
Ate	65	46		
MDDS score			4.3	0.039
Never ate	19	41		
Ate	81	59		

4.7 Nutritional status of the pregnant women attending antenatal care at Mbagathi hospital

Figure 7 represents the nutritional status of the pregnant women based on their mid-upper arm circumference measurements (MUAC). About 62% of the pregnant women had normal nutritional status with a MUAC measurement of between 22.8 - 30.57. About 27% of the women were obese with a MUAC readings of >30 cm while 11% of the women were underweight with MUAC reading of <22 cm.
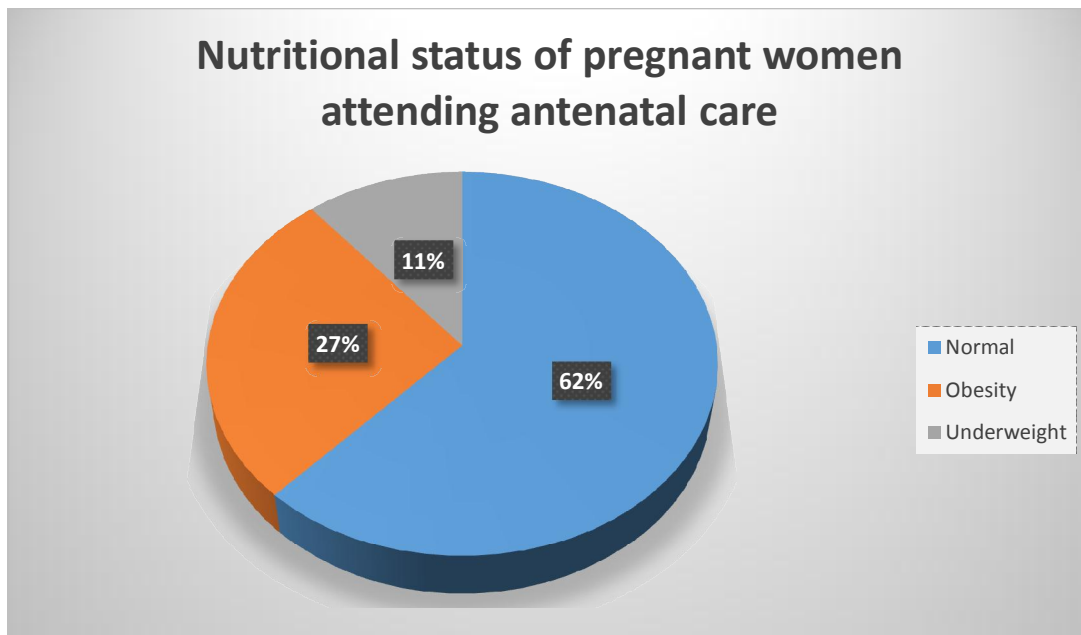
Figure 7: Nutritional status of pregnant women attending antenatal care at Mbagathi hospital based on MUAC cut-off points

Key

22.8-30.57   Normal

>30.57   Obesity

<22.8   Underweight

Figure 8 shows the association between knowledge levels and nutritional status. Among the women who were underweight with a MUAC reading of > 22cm, 26% had low knowledge on maternal nutrition while 9% had high knowledge. In the normal nutritional status category, 65% had high maternal nutrition knowledge, while 48% had low knowledge. There was no difference in knowledge levels in the obese group

There was a statically significant difference between the nutritional knowledge and the

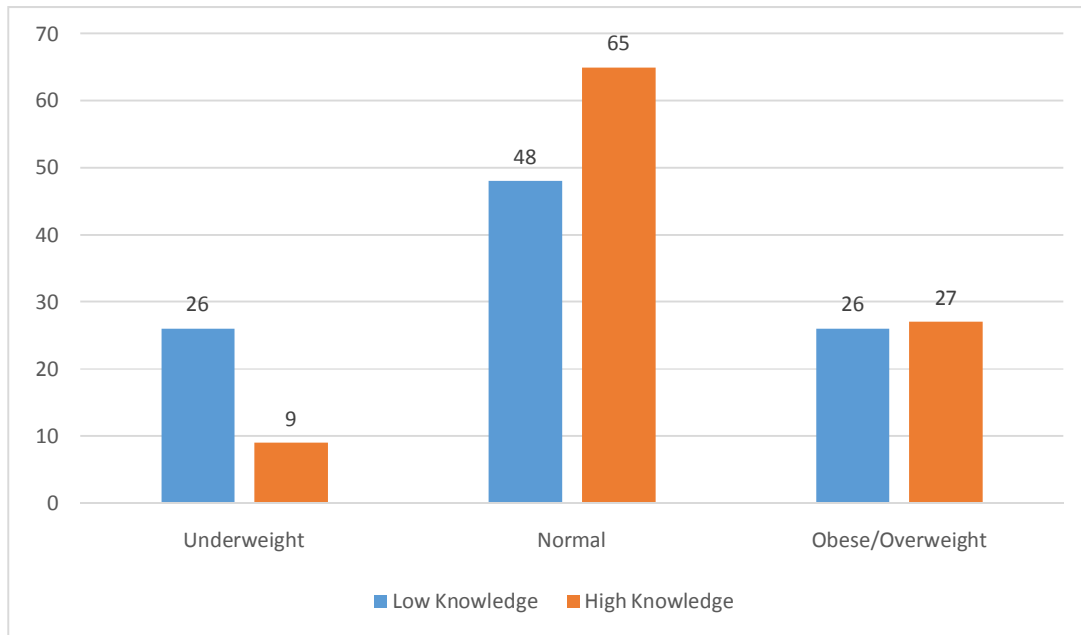nutritional status of the pregnant women (p=0.018).

Figure 8: Association between the level of nutritional knowledge and nutritional status of the women attending antenatal care at Mbagathi hospital

CHAPTER FIVE: DISCUSSION

5.1 Introduction

Antenatal care is a pregnancy related service provided to expectant women by health care workers to prevent neonatal deaths and maintaining the health of a woman during pregnancy. It is becoming increasingly evident that pregnancy period is an influential and teachable moment to promote nutrition among pregnant women (Arrish, Yeatman, & Williamson, 2014). Due to regular contact with health care providers, pregnant women are interested and actively seek for more information regarding maternal nutrition (Obago, 2013).

5.2 Socio-demographic context of the study participants

Socio-demographic context of a study population has been found to have significant associations with variables under investigation in a study.

There was no significant association between nutritional knowledge levels and a socio-demography aspect like education status, occupation, marital status and household income. In a study to assess dietary patterns of pregnant women in Nepal also found no association between women literacy levels and knowledge of nutrition (Shah et al., 2017). However, Studies by (Ogunba&Abiodun, 2017) and (Leong Wong, ZheXin, & Lean Keng, 2018) revealed a significant association between nutritional knowledge and socio-demographic characteristics like education status, occupation and household income. These two studies indicate socio- demographic factors like high education status, play a role in that pregnant mothers with high education levels displayed high nutritional knowledge due to their ability to understand nutrition information disseminated by health workers. However, (Arrish et al., 2014) suggests that the period of pregnancy makes women more teachable and regular interaction with care (Placeholder4) (Placeholder4)providers makes them actively seek nutrition information for better pregnancy outcomes. This could explain the lack of significance between socio-demographic factors and nutritional knowledge in this study. All pregnant women irrespective of their social-demographic context are receptive of nutrition information and antenatal health care workers should put in more effort to pass information in a simple and easy to understand language coupled with practical demonstration and can also help the women understand the information better.

This study noted a significant association between the household size of the respondents with their dietary diversity score. A study to find out predictors

of adequate dietary diversity among pregnant women in Ethiopia showed that pregnant women from a family size of less than five were three times more likely to have an adequate dietary diversity than their counterpartsø from a family size of six and above (Kuma, Tamiru, &Belachew, 2021).

A possible explanation for the presence of significance in this study a small household has a lesser burden of food distribution compared to a large household.

5.3 Level of Nutritional knowledge of the study participants

Provision of nutrition education by health care professionals is among the key components of ANC where during ANC sessions, pregnant women are equipped with knowledge on maternal nutrition which is supposed to influence their dietary practices for better pregnancy outcome. In this study, more than two thirds of the respondents had adequate nutritional knowledge

The results of this study are in agreement with a similar study in Malaysia (Leong Wong et al., 2018) where more than half of the respondents (63%) had high knowledge regarding maternal nutrition during pregnancy. About 61% of participants in a study by (Nana &Zema, 2018) scored highly on most statements to assess nutrition knowledge except for knowledge about iodine, vitamin A and iron food sources. (Mshanga, Martin, &Petrucka, 2020).

In a study by (Zerfu&Biadgilign, 2018) pregnant mothers scored poorly in nutrition knowledge questions. They had very limited knowledge on what constitutes a balanced diet, benefits of key micronutrients during pregnancy, food sources of specific nutrients and rich dietary sources of iron and vitamin A

When pregnant women are adequately equipped with knowledge regarding their nutritional needs, they are likely to improve their dietary intake and nutrition status

The level of nutrition knowledge of pregnant mothers can be influenced by many factors including their level of education of the mother, occupation, the number of ANC sessions attended, practical demonstration during nutrition education sessions, household income (Leong Wong et al., 2018), (Zerfu&Biadgilign, 2018) and (Emara, 2019).

In this study, adequate nutrition knowledge displayed by the respondents could be because of vast topics on nutrition taught during nutrition education sessions

Most of the respondents had attained secondary education, and that could have made it easier for them to receive, process and understand information disseminated to them by health workers at the clinic

5.4 Dietary practices of the pregnant women attending antenatal care at Mbagathi hospital

About 63% of the respondents had an adequate dietary diversity score because they had consumed five or more food groups of the ten food groups 24 hours preceding the survey. Over 50% of participants in studies by (Zelalem, Endeshaw, Ayenew, Shiferaw, &Yirgu, 2017a) and (Nana &Zema, 2018) had adequate dietary diversity score. However, (Aliwo, Fentie, Awoke, &Gizaw, 2019) found that only 31% had an adequate dietary diversity score. The dietary diversity of pregnant women can be affected by factors such as level of income, the level of nutrition knowledge and the household size

Education status, household food insecurity and level of nutritional knowledge were significantly associated with the dietary practice of study participants in a study by (Tsegaye, Tamiru, &Belachew, 2020). Participants who had attained secondary education were 3.4 times more likely to consume a diversified diet, women from food secure households were 1.6 times more likely to consume a diversified diet.

Delil, Zinab, Mosa, Ahmed, &Hassen, (2021) also found out that major determinants of dietary practices of pregnant women in their study were education level of both the woman and her partner, level of household income, occupation of the participant and partner and whether the participant was receiving nutrition information.

In the current study, adequate level of nutritional knowledge significantly influenced the participantøs dietary practices. Pregnant women who are aware of their nutritional needs are more likely to consume more diversified diets than their counter parts with poor or low knowledge.

The mean household size of three could also have enabled for households to afford variety hence contributing to a high dietary diversity score.

5.5 Distribution of nutritional knowledge and mean dietary diversity score of pregnant women attending antenatal care at Mbagathi hospital

This study revealed a significant association between nutritional knowledge and the mean dietary diversity score for the ten food groups. For specific food groups, there was a strong association between nutritional knowledge and consumption of dark green leafy vegetables and other colored vegetables at.

In a study by Zelalem, Endeshaw, Ayenew, Shiferaw, &Yirgu, (2017b) to find out the effects of nutrition education on nutritional knowledge and dietary practices among pregnant women in Addis Ababa, the participants dietary practices improved from 46.8% to 83.7% post exposure to nutrition education. This study implies that provision of nutrition education improved the nutritional knowledge of the mothers hence an improvement in their dietary practices

(Tsegaye et al., 2020) found out that nutritional knowledge was a key factor associated with dietary practices of the respondents in the study. Mothers who had good nutritional knowledge were 1.7 times more likely to consume a diversified diet compared to their counterparts. Nutrition education provides women with knowledge on how to improve their dietary. With adequate nutritional knowledge, pregnant women are likely to make appropriate food choices and also ensure variety of nutrient dense foods in their daily food selection.

Health care providers at ANC clinics need to continuously create more awareness on the importance of adequate consumption of food different food groups. This foods groups offer a variety of important nutrients like proteins, carbohydrates, vitamins and minerals and essential fatty acids (FAO & 360, 2016) and (Perumal et al., 2013). Pregnant women need these nutrients in larger amounts more than non-pregnant women for growth and development of the baby, building immunity, brain development for the growing baby and energy provision. If pregnant mothers are made more aware of the specific functions of these nutrients, it would influence their dietary practices hence much better scores for this nutrients.

5.6Nutrition status of the study participants attending antenatal care at Mbagathi hospital

In this study, the good nutrition status displayed by more than half of the participants could be attributed to high knowledge about maternal nutrition and adequate dietary diversity.

In a study to assess the nutritional knowledge and nutrition status of pregnant women attending antenatal care in Ethiopia, 80% of the pregnant women had a normal nutrition status and 19% were underweight (Nana &Zema, 2018)

5.7 Distribution of nutritional knowledge levels by nutritional status of pregnant women attending antenatal care at Mbagathi hospital

This study revealed a significant association between nutritional status and the level of

nutritional knowledge

When women are knowledgeable about their nutrition needs in pregnancy, they are likely to improve their nutrition practices hence better nutrition status. Some women however may have high knowledge but are either undernourished or overweight. (Beyene, 2013)Presence of a medical condition, low income level and large household size could be some of the factors hindering them from achieving optimum nutrition in (Asma, Asma-Ul-Hosna, &Ashraful, 2012 and Lundqvist et al., 2014).

5.8 Association between the level of nutritional knowledge and antenatal care attendance

This study displayed a significant association between the number of antenatal visits attended with the level of nutritional (p=0.03). Study participants who had attended four or more antenatal sessions displayed high levels of nutritional knowledge. Zelalem et al., (2017b) found out that exposure to nutrition education during antenatal visits improved the nutritional knowledge of study participants from 53.9% pre exposure to 97% post exposure. These implies that nutrition education offered by health care providers during antenatal care sessions play a key role in improving nutritional knowledge of pregnant mothers. Therefore, health care providers should encourage pregnant mothers to attend at least four or more sessions. The earlier a pregnant woman initiates antenatal visits, the more knowledge the pregnant woman is likely to gain.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

In this study, majority of the respondents had adequate knowledge on maternal nutrition. The women who attended more ante natal sessions displayed high level of nutritional knowledge than the ones who attended fewer sessions. Women with high knowledge scores had adequate dietary diversity and good nutrition status. However, most of the women in the overweight and underweight category, displayed poor maternal nutritional knowledge.

6.2 Recommendations

1. The Ministry of Health and partners need to continuously create more awareness and encourage women to initiate ante natal care early in pregnancy and attend follow up visits as required.

2. Particular attention has to be paid to the underweight and overweight women since they display low knowledge levels. Health care professionals should go an extra mile to find out why they are unable to make the right nutrition choices where food is concerned.

3. The Government should provide (Other than maternal nutrition guidelines used by health workers), carry home reference materials like flyers should be available for pregnant women. Food group dummies should also be used in order to improve the richness of the session.

4. Similar studies need to be carried out country wide in order to generate more data that can be used to improve the standards for maternal care in Kenya as well as to inform policy. Overall, however, pregnant women should be encouraged to start ante natal care within the first trimester of pregnancy and also ensure they attend every subsequent session to maximum benefit from the services offered.

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APPENDIX 1: STUDY QUESTIONNAIRE

Questionnaire Numberí .í í í í

Name of Interviewerí í í í í ..í í í í í í í í ..í í Dateí í í í í í í í í ..

SECTION A: SOCIO-DEMOGRAPHIC AND SOCIOECONOMIC CHARACTERISTICS

Please circle or fill in the most appropriate response where applicable

1. What is your age in years? _____

2. What is your marital status now?

A. Married   C. Widowed   E. Divorced

B. Single /Never married   D. Separated

3. What is your level of education?

A. No education/ Illiterate   B. Primary education   D. University

C. Secondary education   C. College

4. What is the gestational age of your pregnancy?

A. First trimester   B. Second trimester   C. Third trimester

5. What is your main occupation?

A. Salaried employee   B. Self-employed   C. Farmer

D. Casual laborer   F. Housewife

E. Other (specify)

6. What is the monthly income level of your household?

A. < Kshs 5000   B. Kshs 5000-10000   C. Kshs 10000-20000

D. Above Kshs 20000

7. What is your family size?

A. 1   B. 2   C. 3

D. 4 plus

8. Receiving nutrition information?

A. Yes (specify who gives information)

B. No

9. Other than antenatal clinic,

SECTION B: TEST OF NUTRITION KNOWLEDGE

In this section, Iam going to ask you some questions about nutrition of pregnant women. Please let me know if you need me to clarify any of the questions. Feel free to ask any question you may have.

10. What do you think is the importance of adequate nutrition during pregnancy?

    A. To support the growth and development of the fetus and maintenance of the woman's own health

    B. To support growth and development of the fetus

    C. I don't know

    D. Other

    (specify)í í

11. How should a pregnant woman eat in comparison with a non-pregnant woman to provide good nutrition to her baby and help him/her grow?

A. Eat a variety of foods from different food groups

B. Eat only what she craves

C. Maintain a normal serving size of food as a non-pregnant woman

D. Other (specify)

11. During pregnancy, it is advisable for a pregnant woman to

A. Eat an extra meal on top of the three regular meals

B. Eat less food

C. Eat the same as before during pregnancy

D. Others (specify)

12. Can you name a potential problem when a pregnant woman gains too little weight?

    A. Risk of giving birth to a low weight baby

    B. Risk of baby being born prematurely

    C. I don't know

    D. Other (specify)í ..

13. Name one complication that can arise when a pregnant woman gains too much weight that is above the recommended?

A. Chances of giving birth via caesarian section increases

B. A

14. Most pregnant women would benefit from two a supplement type or tablet during pregnancy. Which one?

A. Folic acid

B. Iron and folic acid supplement

C. Don∉t know

15. Can you tell me why it is important to take that supplement during pregnancy?

A. To prevent anemia and birth defects

B. To increase appetite

C. Don∉t know

16. What is the frequency of taking the above named supplement during pregnancy?

A. Daily throughout pregnancy

B. Once in a week

C. I don∉t know

17How often should a baby younger than six months be breast fed or fed with breast milk?

    A. On demand, whenever the baby wants

    B. After 3 hours

    C. Don∉t know

    D. Other (specify)í í

18. What is the importance of iron during pregnancy?

    A. Formation of blood for both the mother and baby

    B. Appetizer

    C. Energy giving

    D. Control of heartburn

19. Why should you prevent meat and other raw foods from touching other foods such as those that are cooked or ready to eat?

A. Raw foods may contain germs which may be transferred to other foods

B. Don∉t know

C. Other

20. What should you do before washing fruits and vegetables?

A. Wash them thoroughly before cooking or eating

B. Peel them before washing

C. Other

D. Don∉t know

21. Identify practices to avoid during pregnancy

A. Smoking

B. Alcohol consumption

C. Use of illegal drugs

D. All of the above

SECTION C: INDIVIDUAL DIETARY DIVERSITY SCORE

Kindly let me know the foods that you consumed in the past 24 hours.(Before commencing the questionnaire, ask if the day before the interview was normal day i.e. no festivals, no feast, no fast; if YES, proceed to other questions, if NO ,continue. Include any snacks consumed

Food group	Example of locally available foods	YES=1, NO=0
1. Grains,white roots tubers and plantains	Maize wheat, sorghum,millet, breads, cassava,sweet potatoes, yams Ugali, porridge and other grains and other foods made from these	
2. Pulses	Beans, peas,lentils,chick pea, cow pea, soy bean	
3. Nuts and seeds	Sesame seeds, sunflower seeds, pumpkin seeds, groundnuts, macadamia, cashew nuts	
4. Dairy	Milk, cheese, yoghurt	
5. Meat poultry fish	Red meat, organ meats, sea food, chicken meat	
6. Eggs	From chicken, ducks, guinea fowls	
7. Dark greeny leafy vegetables	Cassava leave, pumpkin leaves, bean leaves, amaranth, manage, kales, spinach	
8. Other vitamin A rich fruits and vegetables	Ripe mangoes and papaya passion fruits, melons, carrots, pumpkin, red pepper	
9. Other vegetables	Fresh peas, green beans,tomato, cucumber okra, onions, mushrooms	
10. Other Fruits	Wild fruits, apple, ripe bananas, guava, figs, grapes, kiwi fruit, lemon, lime	

Thank you for your time and participation in this study

APPENDIX 2: OBSERVATION GUIDE AT THE ANTE NATAL CLINIC
INFLUENCE OF NUTRITION EDUCATION ON NUTRITIONAL KNOWLEDGE AND DIETARY PRACTICES OF PREGNANT WOMEN ATTENDING ANTENATAL CARE AT MBAGATHI HOSPITAL

Name of Researcher _____

Date _____

Please observe the following practices and availability of the mentioned items at ANC clinic

1) Nutrition education topics essential in pregnancy

QUESTIONS ON KEY NUTRITION INFORMATION THAT SHOULD BE PROVIDED DURING ANC APPOINTMENTS	ANSWERS 1) YES 2) NO
1. Are pregnant women taught about the importance of adequate nutrition during pregnancy?	
2. Are pregnant women informed about relevance of appropriate weight gain during pregnancy?	
3. Are pregnant women taught about increased nutrient requirements?	
4. Do service providers mention some of the nutrient rich sources locally available suitable for pregnant women?	
5. Are pregnant women educated on the importance of micronutrient supplementation during pregnancy?	
6. Are pregnant women issued with information education materials such as leaflets, handouts or brochures on guidelines for healthy eating habits	
7. Do service providers address food safety, hygiene and appropriate food preparation methods?	
8. Are pregnant women taught about nutrition in special circumstances such as chronic diseases?	

APPENDIX 3: GUIDELINES AND RESOURCE MATERIALS AVAILABLE ON MATERNAL NUTRITION

GUIDELINES/RESOURCE MATERIALS AVAILABLE	AVAILABILITY 1)YES 2)NO	USE 1)YES 2) NO
National maternal, infant and young child nutrition policy		
Maternal, Infant and Young Child Nutrition Guidelines for Health Workers		
Take home brochure on õNutrition during Pregnancy and Lactation		

APPENDIX 4: CONSENT FORM
FOMU YA IDHINI YA KUSHIRIKA KATIKA UTAFITI

KICHWA CHA UTAFITI: *UshawishiWaElimuYaLishe Bora KwenyeKiwango Cha MaarifaYaLishe Bora Na Mazoea YaUlajiWaWanawakeWajawazitoWanaopokeaHudumaYaKlinikiYaUjaUzitoKatikaHospitali YaMbagathi*

Mtafiti mkuu Na taasisi husika:

Marygorret Maloba, mwanafunzi wa shahada ya Sayansi, idara ya FSNT, chuo kikuu cha Nairobi

Watafiti-wenza Na taasisi husika:

1. Professor Wambui Kogi-Makau, Mkuu wa idara, FSNT, chuo kikuu cha Nairobi
2. Dr Mulwa Dasel Kaindi, Mkufunzi, Idara ya FSNT, chuo kikuu cha Nairobi

UTANGULIZI

Ningependakukuelezajuuyautafitiutakaofanywanawatafitiambaowametajwa.Kusudi la fomuhiiyaidhinini kukupa maelezoambayoyatakusaidiakuamuaiwapoutashirikikatikautafitihuu au la.Kuwahurukuulizamaswaliyoyotekuhusukusudi la utafitihuu,lipilitakalofanyikaunapokubalikushirikikataikautafiti, madaharanafaidayautafiti, hakizakokamamshirikiwakujitoleanachochotekileambacho kina utatakuhusu utafiti huu.

Utakaporidhikanamajibuyamaswaliyako, utakuwahurukuchaguakushiriki au la.Utakapoelewakusudi la utafitihuunakukubalikushiriknitakuombautiesahihikatiakfomuhii Kanunizinazozingatiwakatikautafitiwakiafyanikamazifwatazo:

1. Uamuziwakokushirikikushirikikatikautafitiniwakujitolea
2. Wawezakuamuakujiondoakatikautafitipasipokutoasababuzozotezakujiondoa
3. Kukataakushirikikatikautafitihakutaadhirihakizakozakupatahudumazakiafyakatikahos pitalihiiamahospitalizingine

Tutakupanakalayafomuyaidhiniuwekekwaajiliyakumbukumbu

Je, niendelee? ***NDIO/HAPANA***

UtafitihuuumeidhinishwanakamatiyautafitiyaHospitalikuuya Kenyatta ikishirikiananachuokikuu cha Nairobi. Nambariyautafitinií í í í í í í í ..

UTAFITI HUU UNAHUSU NINI?

Watafitiwaliotajwahapombeleniwanahojiakina mama wajawazito. Kusudi la mahojianonikutakakujuaiwapoiwapoelimuyalisheinayotolewakatikaklinikiwakatiwaujauzitoi

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nachangiakatikakukuzakiwango cha maarifayalishenamazoeayaulajiyawanawakewajawazito.

Washiriki katika utafiti huu wataulizwa maswali kuhusu mazoea ya ulaji wao katika haliyaoujauzito. Takribanwashiriki 152 walichaguliwa kushiriki kupitia njia ya bahati nasibu

NI LIPI LITAKALOFANYIKA IWAPO UTAAMUA KUSHIRIKI KATIKA UTAFITI HUU?

Iwapoutakubalikushirikikatikautafiti, yafwatayoyatafanyika

1. Utahojiwafaraganinamtafitiambayeamehitimuiliuwehurukujibumaswali
2. Mahojianoyatachukuakiasi cha dakika 25-35.
3. Mahojianoyatahusumaswalayalishe bora wakatiwaujauzito, nyongezayamadini ya iron na folic acid, nautumiajiwadawanapombewakatiwaujauzito

Tutakuombautupenambariyakoyasimuilituwezekuwasiliananawetutakapohitajimajibukwamaswaliambayoutakuwahaujajibu.Nambariyakoyasimuitatumiwatuna wale watuambaowanahusikana utafiti huu.

KUNA MADHARA, HATARI NA USUMBUFU WOWOTE AMBAO UNAWEZA TOKANA NA UTAFITI HUU?

Utafitiwakiafyaunawezakuletamaharakwamshirika.Kamawatafiti, tunatiajuhudizotekupunguzamadharayoyote.Baadhiyamadharayautafitinikupotezafaragayamshiriki.Tunakuhakikishiayakwambayaleyoteutakayoutuelezeatutayawekasiri.Tutatumianambari fiche badalayajinalakokukutambua

Madharamenginenikwambamaswalimengineyanayoulizwayanawezatibuahaliyawasiwasi.

Iwapokutakuwanamaswaliambayohautapendakujibu,unawezayaruka.Unahakiiyakukataakuhojiwaamakujibumaswalimenginewakatiwamahojiano

Kama watafiti, tunaelewakwambssivizurikuendeshamahojianopalipowatuwengi/umma, kwahivyotutafanyamahojianofaraganiambapoutakuwahurukujibumaswali.

Mwisho, mtafitiambayeatakuhojiamehitimukatikamaswalayakuendeshamahojiano

KUNA FAIDA YOYOTE KATIKA UTAFITI HUU?

Maelezoambayoutatupayatatusaidiakuelewajukumu la klinikiwakatiwaujauzito.Utafitihuuunalengo la kuchangiakatikakuboreshautoajiwahudumayaelimuyalishe bora katikaklinikizaujauzitokatikahospitalizaummanchini Kenya.

Lengo linguine nikuhakikishwakwamba sera zilizopo, miongozonataratibuzalishe bora katikaujauzitozinawezaboreshahudumayalisheya mama katikahospitaliyaumma

JE, KUSHIRIKI KATIKA UTAFITI HUU UTAKUGARIMU CHOCHOTE?

Haitakugharimu pesa yoyote kushiriki katika utafiti huu

JE , IWAPO UTAKUWA NA MASWALI YOYOTE HAPO MBELENI

IwapoutakuwanamaswaiZaidiamawasiwasinkuhusukushirikikatikautafitihuu, tafadhalipigasimu au tumaujumbemfupikwawatafitiukitumianambariutakayopewachiniyaukurasahuu.

KwahabariZaidikuhusuhakizakokamamtafitiwa, unawezakuwasiliananamwenyekiti, kamatiyautafitiyayahospitalikuuya Kenyatta na chuo kikuu cha Nairobi. Nambariyasimu 2726300 ext 44102 email :*uonknh_erc @uonbi.ac.ke*

CHAGUO ZAKO ZINGINE NI ZIPI?

Uamuziwakokushirikikatikautafitiniwakujitolea

Unauhuruwakukataakushirikikwautafitipiawawezakujiondoakwenyeutafitiwakatiwowote

FOMU YA IDHINI

TaarifayaMshiriki

Nimesomafomuyaidhini / nimesomewanamtafiti.Nimejibiwamaswalikwalughaninayoelewa.Nimeelezwamadharanafaidayautafitihuu.Naelewakwambakushirikikwangukwenyeutafitihuuniwakujitoleananinahakiyakujiondoawakatiwowote.Nimechaguakushirikikatikautafitihuu.Ninaelewakwambajuhudizotezi tafanywailikuyawekamahojianohayasirinanambari fiche itatumiwakunitambua.

Kweakutiasahihikwenyefomuhii, sijatoahakizanguzakisheria.

Utakubalikushirikikatikautafiti? **NDIO/LA**

Utakubalikupeananambariyakoyasimukwamawasilianoyabaadayekuhusuutafiti: **NDIO/LA**

SahihiyaMshirikií í í í í í í í .Tareheí í í í í í í .

Taarifayamtafiti

Nimewezakutoalmaelezoyotemuhimukuhusuutafitihuukwamshirikinanatumaikwambaameelewanaamekubalibilaushawishiwowote

Jina la mtafitií í í í í í í .Tareheí í í í í í

Sahihiyamtafitií í í í í í .Tareheí í í í í í í

Jukumukatikautafitií í í í í í í í í í í í í í ..

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