FACTORS ASSOCIATED WITH UTILIZATION OF PRECONCEPTION CARE AMONG WOMEN ATTENDING MOTHER AND CHILD HEALTH CARE IN KAPSABET REFERRAL HOSPITAL, NANDI COUNTY, KENYA

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APPROVAL SHEET

This thesis/dissertation entitled **Factors Associated with Utilization of Preconception Care Among Women Attending Mother and Child Health Care in Kapsabet Referral Hospital, Nandi County, Kenya**

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DECLARATION

DECLARATION BY THE CANDIDATE

I declare that this thesis is my original work and to the best of my knowledge this work has not been published and/or presented to any University for an award of a degree.

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Hanna Ndungwa Nyabuto Date

DECLARATION BY SUPERVISORS

This thesis has been submitted for examination with our approval as supervisors at the University of Eastern Africa, Baraton.

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ABSTRACT

Preconception care (PCC) is the care provided to all male and female who have not conceived before, whether planning or not to have a baby for they are potential parents. It is also the care given to women who have had a child and planning to get more (inter-conception care). The aim for PCC is to decrease the danger of poor pregnancy outcomes and poor health for women, foetus, and neonates. Healthy mothers and children is the wish of every individual, family, country and Nation. Nobody wishes have a sick mother or child, yet most mothers are still suffering adverse health conditions caused by poor pregnancy outcomes in Kenya. Thus, the aim of this study was to find out factors that are associated with preconception care utilization among women in Kapsabet referral hospital in Nandi County, Kenya.

A cross-sectional study design was used with a target of population of about 24,000 women in Nandi County. Data was collected from 200 women participants using a validated questionnaire. The zero-inflation Poisson regression analysis was employed to explore the factors associated with utilization of preconception care using the '*zip*' command in STATA version 13.1. The unadjusted and adjusted incidence rate ratios (IRRs) and the 95% confidence intervals (CIs) were then presented in the tables for further interpretation.

After adjusting for all variables, the study found the following variables to be associated with utilization of preconception care among women: marital status, religion, family size, ethnicity, residence, education, pesticide use, alcohol use, previous delivery, having ever lost pregnancy, and the number of current pregnancy. Those who were SDAs (IRR = 1.52; 95% CI: 1.31 – 1.76; $p \leq 0.001$), had more than 4 household members (IRR = 1.24; 95% CI: 1.11 – 1.39; $p \leq 0.001$), had tertiary education (IRR = 1.42; 95% CI: 1.20 – 1.67; $p \leq 0.001$), were using pesticides (IRR = 2.22; 95% CI: 2.00 – 2.46; $p \leq 0.001$) and were in their fourth pregnancy (IRR = 1.42; 95% CI: 1.16 – 1.73; $p \leq 0.001$) were more likely to use PCC than the reference groups.

In conclusion, several variable were associated with the utilization of PCC. However, there were some factors that were associated with low utilization of preconception care including the married, non-local tribes, those residing in rural areas, and those who were drinking alcohol, had previously delivered and lost pregnancy. Public health education and promotion is therefore necessary to improve maternal, newborn and child health in the county.

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I owe much to my Research Supervisors Dr Patrick Owili and Dr. Dorothy Onyango, for their advice and valuable time and support throughout the study also thank my other lecturer and initial supervisors to Doctor Hillario Della Torre who made computer competent.

This project would have never been completed without the support by the Nandi county commissioner's Office the Nandi county director of education for the permission granted to do the research in Kapsabet Referral hospital. I also thank Kapsabet hospital for allowing me to do the research in the facility, especially the MCH Department.

My final word to my family thank you for giving me good environment to develop and coping with my emotions, late hours and busy schedules, to my husband and parents thank you for understanding, prayers and encouragement.

To all of those were of help to me and I did not mention you, God bless you.

DEDICATION

To my family, my beloved Husband Henry Nyabuto, children Dan Onduso, Mercy Moraa, Grace Nyaboke, Gift Jason who supported me and encouraged me to succeed in my life and to my dear parents Samuel musyimi and Jane Nafula for your prayers and inspiration and to who wish well for me, I dedicate this thesis.

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LIST OF ABBREVIATIONS

CDC: Centre of Disease Control

ICC: "Any intervention provided to women of childbearing age among pregnancies, to progress health outcomes for women, newborns and kids."

PCC: Envisages a variety of healthy women, healthy mothers and healthy children; as well as promotes reproductive health for couples.

KRH: Kapsabet Referral Hospital

WHO: World Health Organization

MCH: Mother and child health care

CHAPTER ONE

INTRODUCTION

Background of the Study

There has been a slow gain in the past 20years on the health of women and children in the world; this could be due to failure to utilize the care given to all individuals before conception. This contributes to high maternal deaths in populations (Stephenson, et al., 2014). Consequently, the world health organization reported that preconception care reduces morbidity and death rates of mothers and children (WHO, 2012). Furthermore, low knowledge on the benefits and accessibility of preconception care, has led to low utilization of preconception care (Sipjkens M. K., Voost S.F., Potjer L.C., 2019), and this is applicable in both low- and middle-income countries and high-income countries (WHO, 2012). Moreover, the use of care given before conception is low because of low understanding of accessibility and importance of the service (Sipjkens M. K., Voorst S.F., Potjer L.C., 2019).

The preconception care is defined as "the provision of biomedical, behavioural and social health interventions to women and couples' prior conception, to improve their health condition and between conceptions" (Ayelaw et al., 2017). In the world today, nearly all deaths amid women are pregnancy-related problems (Chorongo D. O., Kinda F. M., Kariuki E. J., Mulewaet, al., 2016). Thus, "preconception care is the mostly essential maternal health care service that reduces maternal and child death and morbidity pace by identifying and treating any risks early enough, promoting wellbeing, and preventing illness" (Lassi et al., 2014). About 90-95% of the maternal deaths are

from low- and middle-income countries and currently close to 500 deaths per 100,000 live births are reported and out of this, over 11% deaths are caused by avoidable causes a number of which can be prevented if preconception care is practiced (WHO, 2013)**.** The preconception care is service that finds-out the health status of couples before conception thus seeks to find-out diet, lifestyle, medical history, family history and the status of past pregnancies (ACOG, 2017).

Screening of women and giving preconception care ought to be started at early adolescent stage for better outcome (Nowlse et al, 2017). This is because nowadays, there are many adolescent pregnancies which are very risky this is because the young adolescents are not fully developed, they still need similar requirements as the pregnancy they tend to carry.

Reports from the low- and middle-income countries indicate that there is poor infant, child and maternal health as well as inadequate information regarding the preconception care, consequently the high maternal death rates and neonatal deaths (Ayalew, et al., 2017). Moreover, In Africa south of the Sahara, maternal health report indicates that there are poor preconception care practices due to poverty, inadequate personnel in health care, lack of knowledge and information given to women before conception (Mason, E. et al., 2014). Considering other studies conducted in Sri Lanka, Nigeria and Sudan; showed that the women's level of knowledge regarding preconception care was very low (Patabendige M., & Goonewarden, I. M., 2013; Idris, S. H., Sambo, M.N. & Ibrahim, M. S., 2013; Olayinka et al, 2014; Ahmed et al., 2015).

Preconception care has been neglected, but it is a significant element of infant, child and maternal health care services (MCHs). (Lue, & Geffen, 2007; Ayalew, et al., 2017). In the high-income countries preconception care has advanced, as well as other

medical services but all in all there are poor advances in birth outcomes are still observed even in the USA (CDC, 2017). According to studies, it is for seen that by use of proper risk assessment and improvement of preconception risk birth outcomes will be improved (Fleur S.M., Damus K., Jack B, 2017).

In the world preconception care has advanced, as well as other medical services but altogether there are poor advances in birth outcomes still observed even in the USA (CDC, 2017). According to the studies, it is for seen that by use of proper risk assessment and improvement of preconception risk birth outcomes will be improved (Fleur S.M., Damus K., Jack B, 2017).

In Kenya, massive efforts have gone into ensuring that every woman is able to access pre-natal care and at now we can proudly boast that 96% of mothers who have delivered a baby in the past five years had at least one pre-natal care clinic visit (Kenya Demographic Health Survey, 2014). On the other hand, there has been no proper use of preconception care, women only come to the antenatal after an accidental unplanned pregnancy with increased poor pregnancy outcomes.

All Women have fertility desires and intentions and need advances in treatment and preconception education in order to adequately plan the provisions of raising children who are healthy to adulthood (Finocchario-Kessler et al., 2015). However, the care for women of high risk group, that is—those with specific health or social challenges, should be considered and their needs should be taken care of in a standardized and a comprehensive care plan such as counseling for pregnancy planning, contraception use and safer sexual practices (Ashaba et al., 2017).

These are many areas that preconception care addresses such include, “what they eat before pregnancy, immunization-preventable diseases, genetic conditions, environmental health Infertility/sub fertility, Female genital disfigurement, early

pregnancies, not needed and rapid consecutive pregnancies, Sexually transmitted infections, Human immunodeficiency virus (HIV), Interpersonal violence, Mental health Psychoactive, substance abuse and smoking, all these must be controlled or prevented for good pregnancy outcomes" (WHO,2013).

Statement of the Problem

The proportion of mothers who never, survived a childbirth compared to those who survive childbirth in the low- and middle-income countries is 14 times higher than in high-income countries (United Nations, 2015). Maternal and neonatal, mortality rate is still high in the Sub-Sahara Africa, where Kenya is located, despite the adoption of the sustainable development goal number five whose objective is to "reduce the global mortality ratio to less than 70 per 100,000 live births by the year 2030" (Mandla A. M., Ojochenemi, J. D., 2019).

Globally, over 60 million adolescents become pregnant and deliver each year, and "pregnancy in adolescence has mortality rates twice as high as pregnancy in women" (WHO 2018). To prevent sexually-transmitted infections, unsafe abortions, and unintended pregnancies in young women and adolescent girls, creating awareness, contraceptive use, and reproductive planning is necessary **(**Sohni et al**.,** 2014). The young women soon get into marriage without preparations and knowledge of preconception care, and hence poor pregnancy outcomes (Manson et al., 2014). This study therefore explored the factors that are associated with preconception care utilization among women attending mother and child health care in Kapsabet Referral Hospital, Nandi County, Kenya.

Main Objective of the study

To explore factors associated with the preconception care utilization among women attending Mother and Child Health care, Kapsabet Referral Hospital.

Specific Research Objectives

1. To determine the level of utilization of preconception care in Kapsabet Referral Hospital.

2. To explore factors influencing preconception care utilization among women patients attending Kapsabet Referral Hospital.

Significance of the Study

The study will help all women of reproductive age to know that they can reduce maternal deaths, improve their health status as they reduce pregnancy complications and get better pregnancy out -comes through seeking for preconception care early enough. The study will help them know that they can get healthy babies through utilization of PCC.

The Study will help public health sector to come up with policies that will improve the health of the individuals, in this country Kenya, Nandi county through prevention of Maternal and child mortality rate and birth defects. Thus help the public

health to the have the knowledge on availability of preconception care and the importance of using it (the PCC).

Justification of the Study

This study has also been done worldwide from both high-income countries and low- and middle-income countries, in the Government policies in United Kingdom and United States America aims to reduce prenatal morbidity and mortality rates by promotion of Preconception care (Judith Stephenson et al., 2014). It has also been done in low- and middle-income countries (Ayele D.Z, Belayihum B., TejiK., Ayana D.A, 2014). Thus the studies done in other places, have found out the unmet need for knowledge, awareness and utilization of PCC for all women. (Stephenson et at., 2014) (Bhutta et al., 2014) and this unmet need, needs as study like this one to fill the gap that other studies have not filled.

Conceptual Framework

This study utilized one independent variable, utilization of preconception care and five dependent variables which include socio-demographic factors, environmental factors, health factors, life style factors and social economic factors (Figure 1).

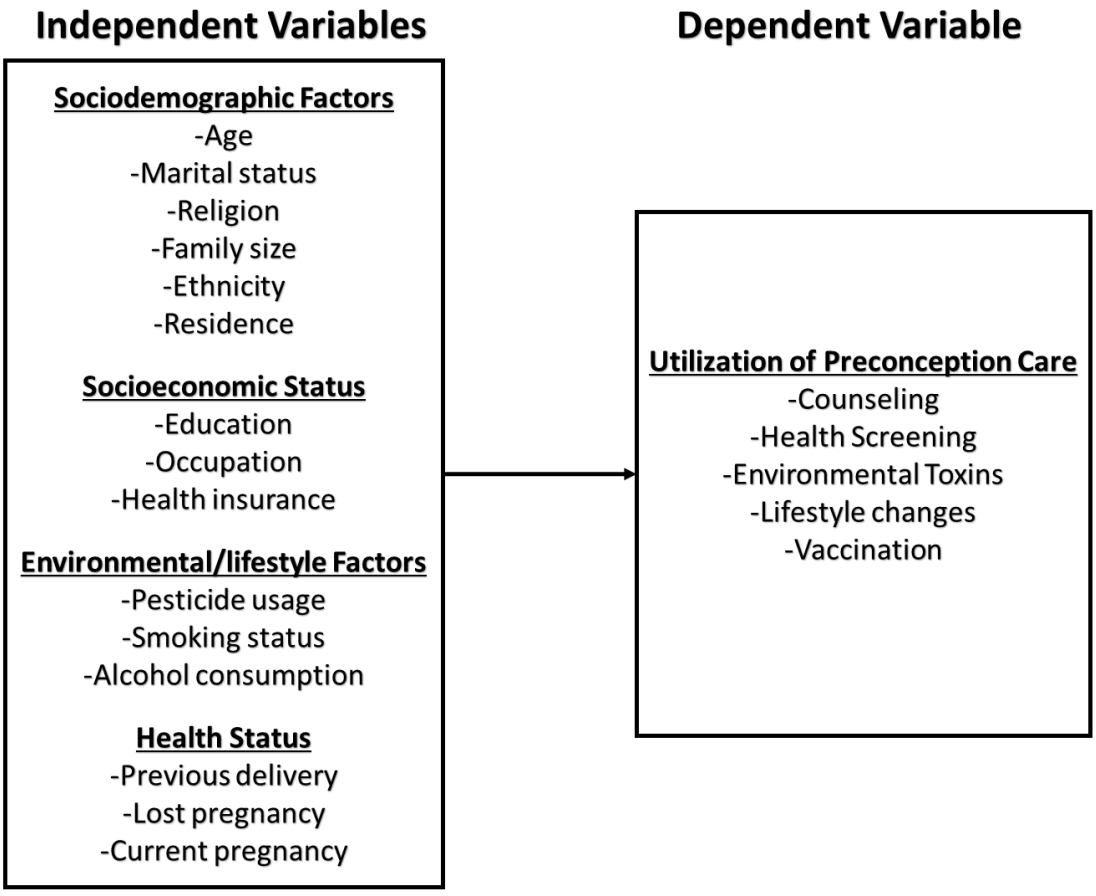


Figure 1 The conceptual framework of factors associated with utilization of preconception care.

Scope of the Study

The study was conducted at Kapsabet Referral Hospital in Nandi County, Kenya (Figures 2, 3 and 4). The study population was women of reproductive age 16 – 45 years' old those that attended the MCH at the hospital. This study focused on those who attended the MCH during that month one month those included those who came for antenatal clinic, postnatal clinic those who had come for birth control methods and those with special pregnancy related need and needed special care. The study sort to find out the utilization of preconception and the factors that are associated with PCC.

Figure 2: Kapsabet county referral hospital

Figure 3: Kapsabet ambulance services

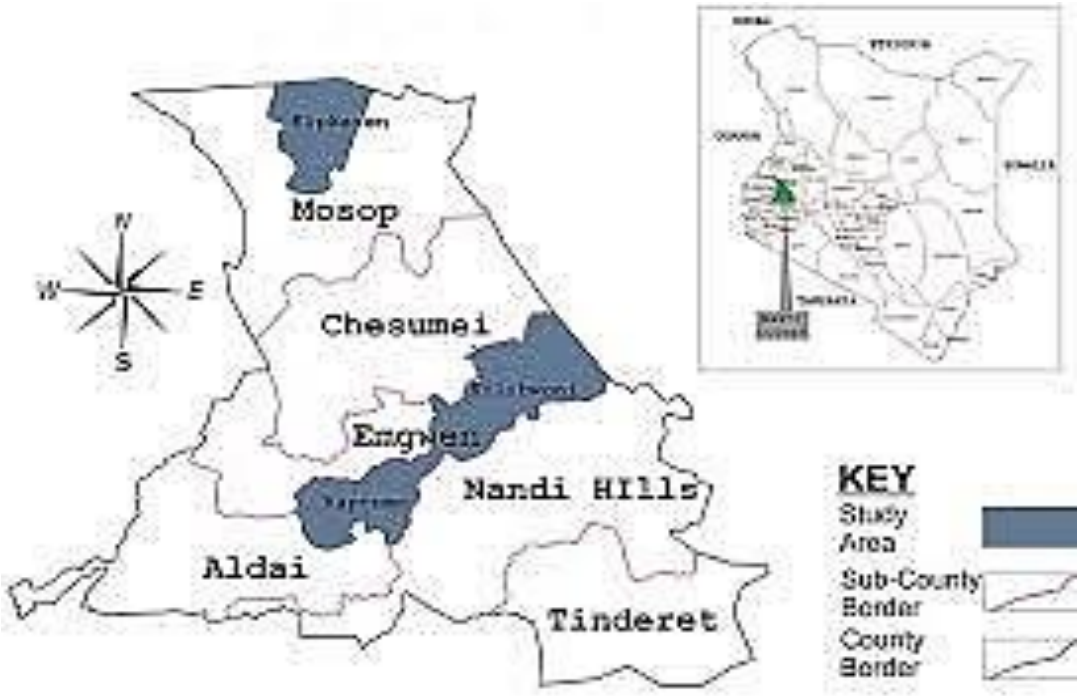


Figure 4: Nandi County Map

Limitation (Anticipated Shortcomings)

The study was not able to cover all women in Nandi County, for not all them came to the hospital within that period of study, there was also language barrier, some cultural limitation on information required by the study. Some respondents were unwilling to answer questions or gave untruthful answers due to the fear of being exposed and may be against their culture to discuss conception issues.

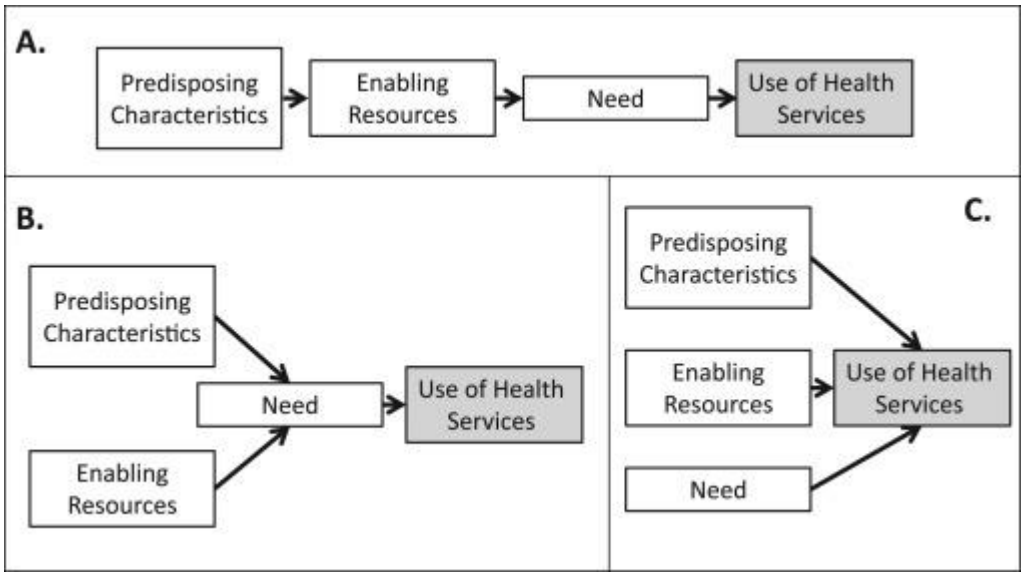
Justification of the Study

This study has also been done worldwide from both high-income countries and low- and middle-income countries in that the Government policy in UK and USA aims to reduce perinatal morbidity and mortality by promotion of Preconception care (Judith Stephenson et al., 2014). It has also been done in low- and middle-income countries (AyeleD.Z,Belayihum B.,TejiK.,Ayana D.A,2014)

Researchesdone in other parts of the world, found out the unmet need for knowledge, awareness and utilization of PCC for all women. (Stephenson et at., 2014) (Bhutta et al., 2014).

Theoretical Framework

In this study the researcher used the Andersen model of health care utilization.



The Andersen Healthcare Utilization Model –

> "is a conceptual model aimed at indicating the factors that guide to the utilization of health services. According to the model, utilization of health services (including inpatient care, physician visits, dental care etc.) is resulted by three dynamics: predisposing factors, enabling factors, need. Predisposing factors can be characteristics such as race, age, and health beliefs. For instance, a person who believes health services are an efficient treatment for an ailment is more likely to seek care. Examples of enabling factors could be family support, access to health insurance, one's community etc. Need represents both perceived and actual need for health care service" (Tesfanye G., Jojenta C., Rojer S., Loxton, D., 2018).

Definition of Operational Terms

Table 1 show the definition of operational terms.

Table 1 Definition of the operational variables variables as used in the study of explore factors associated with the preconception care utilization.

Variable	Definition
DEPENDENT VARIABLE	
Utilization of preconception care	
Counselling conducted	The counselling indicator was defined using counselling received before getting pregnant. It was measured using several indicators that were dichotomized as 0 = no and 1 = yes. These measurements included counselling on: smoking, alcohol abuse and other drug use; folic acid supplementation, 400 mcg daily; sexually transmitted infections including HIV; family planning and pregnancy spacing; maintaining healthy body weight and diet; importance of oral health; increased risk of hepatitis c in those with body piercings; lead and other environmental and occupational exposures; and genetic disorders (including cystic fibrosis and sickle cell).
Health screening	The indicator was defined by the utilization of screening for the following health conditions which were as measured as binary measurements (0 = no and 1 = yes): Genetic conditions (e.g. sickle cell, fibrosis, thalassemia); Infectious diseases (e.g. syphilis, hepatitis C, HIV); Medical conditions screened (blood pressure, diabetes, Rh incompatibility, HIV, anaemia, epilepsy, asthma, tuberculosis, cystic fibrosis, and thalassemia); and Complications from previous pregnancies (caesarean

Variable	Definition
	section, premature delivery, and postpartum haemorrhage).
Advice on environmental toxins	The indicator was defined using the advice women are given on environmental toxins which included the following dichotomized measurements: smoking cessation; use of alcoholism and use of illegal drugs; occupational exposures (e.g. herbicides used in farms); household chemicals (paint thinners, solvents, pesticides); and radiation exposure in early pregnancy.
Lifestyle changes	The indicator was defined as assessment or counselling on lifestyle changes with the following dichotomized measures: recommended regular moderate exercise; avoid hyperthermia (hot tubs); caution against obesity and being underweight; risks of nutritional deficiencies; avoiding overuse of vitamins A and D and caffeine; and screen for domestic violence; counsel on the use of over-the-counter medications.
Vaccination	This indicator was defined with immunization for the following: rubella seronegativity; tetanus; human papillomavirus; influenza; varicella. The measures were also binary (0 = no and 1 = yes).
FACTORS	
Sociodemographic factors	
Age group	The age was defined using three categories, that is, < 25, 25 – 30, and > 30.
Marital status	Was defined using the following 3 categories: single, married and formerly married (i.e., divorce, separated and widow).

Variable	Definition
Religion	Was defined as the following denomination: Catholic, Anglican, Seventh-Day Adventist, Protestants and other
Family size	This was defined as ≤ 4 members vs. > 4 members in the household.
Ethnicity	Ethnicity was defined as Kalenjin, Luhya, Luo and other tribes.
Residence	Was defined as rural and urban.
Socioeconomic factors	
Education	The indicator was defined as primary and below, secondary and tertiary.
Occupation	This variable was defined as unemployed, technician/professional/managerial, sales/clerical and other (i.e., person, farming, household/domestic worker, skilled, unskilled manual and other).
Health insurance cover	Was defined as whether the woman had health insurance cover or not.
Environmental/Lifestyle factors	
Pesticide use	It was a binary indicator on whether the women were using pesticides/indoor spray at home.
Drinking alcohol	This was defined with the use of alcohol as yes = 1 and no = 0.
Smoking cigarette	This was defined with the smoking of cigarettes or not.
Health Status	

Variable	Definition
Previous delivery	This asked whether the women had ever given birth as yes = 1 and no = 0.
Lost pregnancy	This asked whether the women had lost any pregnancy as yes = 1 and no = 0.
The number of the current pregnancy	It was defined with the following categories of the number of the current pregnancy as: 1st born; 2nd born; 3rd born; and 4th born and above.

CHAPTER TWO

REVIEW OF LITERATURE AND RELATED STUDIES

Preconception

Pregnancy is one of the most important and the most risk experience in a woman's life and planning for it is the best solution, to solve problems related to pregnancy and to create a safe full term pregnancy (WHO 2013). This is done through preconception care, it also includes the care given before the first pregnancy and the care between the subsequent pregnancies (Mason, et al., 2014), Thus, maintaining and improving the health of mothers and their future babies.

Preconception care is defined as the provision of biomedical, behavioural and social health interventions to women and couples before the occurrence of conception to improve their health status (Ayelaw et al., 2017). Similarly, preconception care is a set of interventions anticipated to classify and to modify biomedical, behavioural, and social risks in women of reproductive age. The goal of preconception care is to improve pregnancy outcomes and women's health in general through prevention of disease and management of risk factors that affect pregnancy outcome and the health of future generations. Preconception care is also Biblical (judges13;3-5) where an angel announced Himself on what Samson's mother was to avoid during pregnancy.

Maternal and neonatal, mortality rate is still high in the Sub-Sahara Africa, where Kenya is, despite the adoption of the sustainable development goal number three

whose objective is to reduce the global maternal mortality ratio to less than 70 per 100,000 live births by the year 2030. Sixty million adolescents give birth each year worldwide, and pregnancy in adolescence has mortality rates twice as high as pregnancy in women. Reproductive planning and contraceptive use can prevent unintended pregnancies, unsafe abortions and sexually-transmitted infections in adolescent girls and women **(**Sohni et al**.,** 2014).

Severity Maternal and Neonatal Mortality and Morbidity Rates

Women have an important duty in the world of increasing or replacing the gone old generation, but it's unfortunate that most of them die while in the process of delivery or shortly after. Women mortality rate is quite high (who meeting in geneva 2012.) the greatest cause is pregnancy related complications, thus there are 287,000 maternal and 2.9 million newborn deaths each year, with an additional 2.6 million stillbirths (Judith and Stephenson et al., 2014), and this is due to lack of preconception care. There is evidence that health problems, behaviors, individual and environmental risks contribute to poor maternal and child health outcomes (Mason et al., 2014; Asamoah et al., 2017; Schwartz et al., 2012; Wekesa & Coast, 2014; Col et al., 2017) dying of without preconception care, infected women face many problems such as, mother to child transmission, unplanned pregnancies which end up in greater risk of preterm birth and low birth weight babies (Col et al., 2017). Many health workers don't have the necessary skill on Preconception care (Adedimeji, A. et al., 2012).

Before the first pregnancy, a schedule for preconception visit to a healthcare giver is needed, to consider genetic material carried by parents through screening. Inclusively nutritional advice is necessary e.g. intake of folic acid and watching out for vitamin A, intake. Also, the advice on giving up of binge drinking, smoking, and drugs abuse and, thus get the help where needed, improving on healthy foods intake. Checking on their caffeine intake and aiming for a healthy weight gain (Baby centre, 2017).

The areas assessed in preconception screening are; infectious diseases this is because some infectious diseases like malaria need to be treated before pregnancy, this is because the medication for malaria may cause abortion, also it is not advisable for expectant mother to deform, for the dew ormer have known side effects. Prescription drugs discourage most of medications during pregnancy. Nutritional status before conceptions important because poor nutrition status causes some nutritional deficiencies e.g. folic acid deficiency cause neural tube in neonates, the socioeconomic status (Marangoni et al., 2016) no woman should bear a pregnancy without proper financial support it's a risky practice.

The behavioural practices that may affect pregnancy outcomes are habits such as smoking, use of illicit drugs, and alcohol use, for they are harmful to the pregnancy outcome (Zohnni et al., 2016).

Preconception care (PCC) identifies and treats any risks early enough, even among the risk groups e.g. HIV positive women who wish to have children can undergo pregnancy, labor, delivery and breastfeeding with greatly reduced risk if they seek early preconception care (Mazzeo et al., 2012). Before conception a couple should make a plan and take action, to see a health care provider and discuss

on their health status. The healthcare provider will take their health history and any adverse medical conditions which could affect pregnancy, should be first attended to. They also discuss any other problems, Asses for any vaccinations that they may be needed before conception (CDC, 2016). Women with special needs also require much more preconception care than the others who are not (Women's Health. Gov. 2012).

Women starting their pregnancy with sub-optional health are not only at increased risk of maternal and neonatal morbidity, but also increased burden on health services (Johnson K. et. al., 2006), where by most women in the world die due to pregnancy related diseases which would be avoided or simply prevented by proper nutrition (Lassi et al., 2014), even maternal morbidity which includes physical and psychological conditions that result from aggravated by pregnancy and have an adverse effect on a woman's health (CDC, 2016). The most severe complications of pregnancy generally referred to as severe maternal morbidity (SMM)(morbidityhttp://www.cdc.gov/reproductivehealth/maternal/infanthealth/severematernalmorbidity.html) which affects more than 50,000 women in the United States every year. Based on recent trends, this burden has been steadily increasing (CDC,2016).

Providing preconception care to adolescent girls and women of reproductive age before pregnancy improves their own health and well-being, as well as pregnancy and newborn outcomes long before pregnancy, this education should help reduce the rates of preterm births (Dean et al., 2013). Consequently, there is evidence that health problems, bad behaviors and individual and environmental risks contribute to poor maternal and child health outcomes (Mason E. et al., 2014).

Preconception care is not a single day clinical visit, but rather ongoing care that is integrated into primary health care to address the needs of women during the different stages of reproductive life (Lassi et al., 2014).

In the global burden of disease, congenital disorders are a leading and hence it requires preconception care before pregnancy because it can be an "effective strategy to reduce the congenital disorders and improve the health of women in the reproductive-age" (Alberg et al., 2014). "Stopping harmful behavior before pregnancy may reduce or even eliminate the risks of some birth defects that occur early in pregnancy" (Bello A. I. et al, 2013).

According to the definition of preconception there are three major interventions that are required before conception and these areas are; biomedical, behavioral and socio economic status. "All men and women should be encouraged to find out their HIV status before starting a family which is a part of preconception counseling and care" (Carter, A. J, Bourgeois, S., O'Brien, N., Abelsohn, K., Tharao W, Greene, S., et al., 2013). "If women test positive, they should be educated in detail of the risks of vertical transmission to the child and the risks for increased mortality and morbidity that is associated with this disease" (Lassi et al., 2014).

The Biomedical (Health Status)

There are many health issues that must be corrected or prevented before conception. "Given the extent of the burden of maternal, newborn and child mortality; maternal, newborn and child health (MNCH) interventions can be

grouped together into package as part of continuum of care" (Lassi et al., 2014). Globally, women are more affected with infectious diseases than men (Ashaba et al., 2017). There are many diseases and conditions that need to be controlled before conception, because they have adverse effect on mothers' health during pregnancy or soon after. There are medications that need to be controlled either changed or dosage reduced for a healthy full term pregnancy (CDC, 2014). Thus evidently highlights on the "importance of women's health status including the presence of chronic diseases, current infections or syndromes, promotes general screening and management for other chronic health related matters" (Boulot et al., 2006). Other infectious diseases like syphilis have serious negative pregnancy outcomes (De Weed S. et al, 2013).

In this research, the women with chronic health problems should be counseled about the risks associated with their disease to pregnancy (Bhutta Z et al., 2011), and the necessity to adjust medication regimens while or during conceiving to optimize hormonal levels and to prevent any harm to the fetus (Lassi et al.,2014). The medical conditions that should be screened include diabetes (Castorino K. & Jovanovic L., 2013), asthma, high blood pressure, anemia, and sexually transmitted infections (STIs) (Chuang C. H. et al., 2010).

Nutritional Status before Conception

Nutritional preparedness is of great importance to couple or individual before a conception for some nutritional deficiencies affect the embryo even before the mother discovers she is expectant (Lassi et., al, 2014). Men also should have consumed healthy foods to produce healthy sperms at the right count to ensure a

healthy pregnancy outcome (Manson E.et., al, 2014). These is achieved through eating foods rich in zinc mineral, and avoidance of using illicit drug for it reduces sperm viability leading to deformed sperm hence poor pregnancy outcome. For women nutritional readiness is very important for the health of the fetus is dependent on maternal nutritional stores, great percentages over 50% of women suffer anemia and over 30% of all women worldwide (Stephene G., Mogongo M., Hashim H. T., Katanga J. et al., 2018). These are mostly due to micronutrient deficiency of iron, folate, vitamin A and B12 whereas the negative effects of anemia in pregnancy include fatigue, poor work capacity, impaired immune function and mortality. To the child leads to mental in capabilities, children who can never pass mathematics. All these can be controlled if a mother feeds well, and attains right weight not overweight nor underweight for all are controlled through preconception nutrition care. Underweight mothers lead to underweight baby, then it becomes circle of similar problems. Good nutrition and health before conceptions central to mother's ability to meet nutrient demands of pregnancy and breastfeeding and are vital for embryo, fetus, infant and child thus the right BMI is necessary.

Behavioural Factors

Smoking Before and During Pregnancy

Smoking during pregnancy is associated with several adverse outcomes including low-birth-weight, small-for gestational-age neonates, placental abruption, premature rupture of membranes, an increase in sudden infant death syndrome, and neonatal respiratory problems (Marangoni et., al, 2016). The time when the fetus is

most vulnerable to the harmful effects of these substances is during the first trimester of pregnancy. Alcohol use by pregnant women is associated with fetal alcohol syndrome and fetal alcohol effects. Cocaine use during pregnancy is associated with premature delivery, placental abruption, in utero fetal stroke, maternal stroke, and low-birth-weight neonates (UNAID, 2014). Hence, preconception referral to drug and alcohol counseling and rehabilitation services is advisable. Pregnant HIV-positive women have increased needs to promote a healthy outcome (Montgomery et al., 2013)

Tobacco Use

Screening of women and girls for "tobacco use (smoke and smokeless tobacco) at all clinical visits using "5 As" (ask, advise, assess, assist, arrange), providing brief tobacco cessation advice, pharmacotherapy (including nicotine replacement therapy, if available) and intensive behavioral counseling services, screening of all non-smokers (men and women) and advising about harm of second-hand smoke and harmful effects on pregnant women and unborn children."

Social Economic

Women with lower educational attainment have greater risks of adverse pregnancy outcomes, are less knowledgeable about health-prevention activities, and family planning. Thus children have fewer options for education, optimal growth and

development and have a higher risk of mortality (Lassi et al., 2014). Knowledge on Maternal nutritional status is an important predictor of birth outcomes (Gruskin et al., 2008), yet little is known about the nutritional status for all pregnant women treated, with combination antiretroviral therapy (cART) particularly in the resource-constrained settings of rural sub-Saharan Africa (Young, S. et al., 2012).

Pregnant women may experience increased health distress and worse health transition during the antenatal mainly because of decreased social support and concern of the physical health of their children (Mbalinda et al., 2015). Women Living with HIV especially require support by non-health sectors, foundations and civil society organizations to collaborate with, and support, public health policy-makers to maximize gains for maternal and child health through preconception care (UNAID, 2014).

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Family Planning

It is estimated that as many as half of all pregnancies in the USA are unplanned or unintended. Thus unplanned pregnancies cause negative health consequences for women, (their partners), and neonates (Col et al., 2017). Women should be advised on the best or suitable family planning method to enable them space their children between two to three years (Sohni et al 2013). The allows a mother to regain the maternal stores to enable next health pregnancy, because children are mothers out of mother's maternal stores.

Environmental Factors

Environmental issues play a vital role in maternal, newborn and child health. It is widely recognized that maternal exposure to adverse chemicals in cigarette smoke, teratogenic medications, or illicit drugs during pregnancy can have adverse consequences for gestational outcomes and the developing fetus (Genuis, S. J. & Genuis, R. A. 2016). The use exposure to toxins make an important contribution towards placental problems like low birth weight, intrauterine growth restriction, as well as have long term effects on neuronal and behavioral development in adult life (Triche and Hossian, 2017) such toxins include use flame retardants (Chemicals used to make household furniture less flammable) this has been linked to learning disabilities in children and other congenital problems. To avoid exposure, wash hands frequently, make use a vacuum fitted with a HEPA filter and mop the floor regularly. Also, avoid coming into contact any foam inside the furniture. In addition, dry cleaning chemicals are not safe thus avoidance of having clothes frequently dry cleaned when anticipating pregnancy is necessary. The use of dry cleaners may be at an increased risk of miscarriage. Thus the women exposed to very high levels of mercury can damage mother's health and increase the likelihood of brain damage, and hearing and vision problems in a developing baby. Some fish contain that contain mercury, include shark (flake), broadbill, marlin and swordfish etc.

Bisphenol-A (BPA) is chemical found in most plastics, and can pass from a mother to her baby in the womb, also has been noted to cause brain and behavior problems in some children, likewise, Mothballs contain the chemical naphthalene, which also lead to serious health problems in small children. Mosquito repellents

have a small amount of the chemicals DEET or picaridin which on entry to the skin causes many complications, and it's best to take care during the first the 1st trimester.

Severity Maternal and Neonatal Mortality and Morbidity Rates

Women have an important duty in the world of increasing or replacing the gone old generation, but it's unfortunate that most of them die while in the process of delivery or shortly after. Women mortality rate is quite high, the greatest cause is pregnancy related complications, thus there are 287,000 maternal and 2.9 million newborn deaths each year, with an additional 2.6 million stillbirths (Judith and Stephenson et al., 2014), and this is due to lack of preconception care. There is evidence that health problems, problem behaviors and individual and environmental risks contribute to poor maternal and child health outcomes (Mason et al., 2014; Asamoah et al., 2017; Schwartz et al., 2012; Wekesa & Coast, 2014; Col et al., 2017). Dying without preconception care, infected women face many problems such as, mother to child transmission, unplanned pregnancies which end up in greater risk of preterm birth and low birth weight babies (Col et al., 2017). Many health workers don't have the necessary skill on preconception care (Adedimeji, A. et al., 2012).

Vaccination History

It is very important that before any conception a mother is given the rightful vaccines for some are detrimental during pregnancy and others help protect the

mother and child from some infections during pregnancy such infections as mumps measles rubella and whooping cough and influenza. These vaccines are important when administered before conception (CDC, 2016).

Genetic Assessment

A health problem that run in one's neighborhood and partner's family. Problems that one has, including preterm birth may affect the current pregnancy one is thinking about. Family issues that are likely to affect one's health, such as lack of support or domestic violence should be addressed including the gap in clinical services where "social identity and value are inextricably linked to reproduction" (Finocchario-Kessler et al., 2014; Goggin et al., 2014; Schwartz et al., 2014).

Female Genital Mutilation (FGM)

"Discussing and discouraging the practice with the girl and her parents and/ or partner Screening women and girls for FGM to detect complications Informing women and couples about complications of FGM and about access to treatment Carrying out defibulation of infibulated or sealed girls and women before or early in pregnancy , Keeping girls in school Influencing cultural norms that support early marriage and coerced sex Providing age-appropriate comprehensive sexuality education Providing contraceptives and building community support for preventing early pregnancy and contraceptive provision to adolescents Empowering girls to resist coerced sex

Engaging men and boys to critically assess norms and practices regarding gender-based violence and coerced sex Educating women and couples about the dangers to the baby and mother of short birth intervals" (WHO).

Mental Health

Assessing psychosocial problems and providing educational and psychosocial counselling before and during pregnancy is paramount. Treating and managing depression in women planning pregnancy and other women of childbearing age is very important, it helps increase a positive outcome during pregnancy. Strengthening community networks and promoting women's empowerment and Improving access to education for women of childbearing age helps women to have positive look at their life increasing their financial stability thus reducing economic insecurity to help them during and after pregnancy.

In Kenya, maternal mortality remains high at 488 maternal deaths per 100,000 live births. (The partnership for Maternal, Newborn and child Health, n.d). To date in Kenya, there is no standardized safer conception training curriculum or counseling guidelines endorsed by the Ministry of Health (MoH) for HCPs to offer individuals and couples (Mmeje et al., 2016). Again in Kenya similar findings from other studies, suggests that many HCPs (health care providers) have no package on preconception care (Finocchario-Kessler et al., 2014; Matthews et al., 2014; Mmeje, Cohen, et al., 2014 and Breitnauer et al., 2015; Matthews et al., 2014).

WHO report shows that preconception care has a positive impact on maternal and child health outcomes (WHO, 2012). This is done through "health

providing age-appropriate comprehensive sexuality education and services promoting safe sex practices through individual, group and community-level behavioural interventions, promoting condom use for dual protection against STIs and unwanted pregnancies, ensuring increased access to condoms, screening for STIs, increasing access to treatment and other relevant health services, too-early, unwanted and rapid successive pregnancies." Professionals responsible for developing national and local health policies, which provides a foundation for implementing a package of pro motive, preventive and curative health interventions to improve maternal and child health. The preconception care is cares that find-out the health status of couples before conception thus seeks to find-out diet, lifestyle, medical history, family history and the status of past pregnancies (ACOG 2017). Other issues related to the cost of and access to preconception care, are lack of resources for assisting in the delivery of preconception care guidelines (Collet et al., 2017), and hence increased, risks of prenatal transmission (Ashaba et al., 2017).

The preconception care in hospitals is one of the major measures globally to achieve the 2030 millennium goals Number five, which states healthy mothers and reduced infant mortality rates (WHO, 2015). Most of those not attending PCC are those who are most in need of it and may knowingly be denied access to PCC. Thus calls women's awareness to attend antenatal care at the preconception stage(Mazza et al., 2013).Studies from South Africa and Kenya reported a lack of standardized service provision and inconsistent counseling on safer conception methods (Crankshaw, Mindry, Munthree, Letsoalo, & Maharaj, 2014; Matthews et al).

There is "poor maternal and child health and lack of knowledge in low- and middle-income countries about preconception care" (Ayalew, et al., 2017) According to a research done it was concluded that women's knowledge of preconception care is

relatively low. thus in this study will find the various ways knowledge on PCC can be provided many studies have shown that women of reproductive age demonstrate low levels of knowledge and behavior related to preconception care (Col et al.,2014)

Preconception care seeks to reduce several risk habits and exposures that can affect fetal development and subsequent outcomes (Mason et al., 2014) hence it is planned to address reproductive system problems, to reduce environmental hazards, toxins and medications that are known be teratogenic, to promote good nutrition and folic acid intake, to advise on weight management, to detect problems related to genetic conditions, family history, substance use, chronic diseases and infectious diseases, to advise on vaccinations, family planning, psychosocial concern, domestic violence, and housing. The preconception care is primary prevention for the future baby and secondary prevention for prospective mothers (Deweger et al., 2011).

Pregnancies are frequently unplanned, and higher rates of unplanned pregnancies occur ignorant women (Kawale et al., 2015). Many conditions can be prevented through appropriate preconception counseling including i.e. infertility, miscarriage, gestational diabetes, pre-eclampsia, placenta abruption, birth defects and malformations, fetal restriction growth, low birth weight and prematurity can be prevented (Ojukwo et al., 2016).

Many studies have shown that women of reproductive age demonstrate low levels of knowledge and behavior related to preconception care (Kawale et al., 2015).

"The world has made significant improvement in saving the lives of mothers and children since Millennium Development Goals 4 and 5 were adopted by world leaders in 2000. Yet even now, with existing effective interventions and public health commitment greater than ever before, there are still 287,000 maternal and 2.9 million newborn deaths each year, with an additional 2.6 million stillbirths further, there are growing problems such as obesity and other chronic health problems with their attendant maternal and fetal risks. A significant proportion of newborn deaths are due to prematurity, which may result from a number of factors. Most disconcertingly, 90% or more of maternal and child mortality remains concentrated in South Asia and Sub-Saharan Africa, countries that simply lack the resources to deliver existing, effective interventions that could prevent many of these deaths. Moving towards preconception care offers the potential for earlier risk assessment and intervention that can benefit the woman or couple even before pregnancy and ensure the healthiest possible start for the newborn child" (Mason et al., 2014). Judith Stephenson and colleagues (2014) says that lack of preconception care contributory factor in maternal deaths. Without preconception care, women face many problems such as mother to child transmission, unplanned pregnancies which end up in greater risk of preterm birth and low birth weight babies. They should be aware of some foods, habits, and medicines that harm the baby — even before he or she is conceived (Women's Health. Gov. 2012). Recommendations for preconception counselling and care References Promoting health, and preventing disease is very important for it is necessary for all people planning or not planning to have a child some day in future and is still in their reproductive (Manson et al., 2016). Preconception care recognizes that many adolescent girls and young women will be thrust into motherhood without the knowledge, skills or support they need**)**

(Dean et al.,2014). Sixty million adolescents give birth each year worldwide, and pregnancy in adolescence has mortality rates at least twice as high as pregnancy in women aged 20-29.

"Preconception care recognizes that many adolescent girls and young women will be thrust into motherhood without the knowledge, skills or support they need" **(**Dean et al., 2014). "Sixty million teenagers give birth every year worldwide, and pregnancy in adolescence has mortality rates at least twice as high as pregnancy in women aged 20-29 years. Reproductive planning and contraceptive use can prevent unintended pregnancies, unsafe abortions and sexually-transmitted infections in adolescent girls and women. Smaller families also mean better nutrition and development opportunities, yet 222 million couples continue to lack access to modern contraception as per the same study. According to another study 1.8 billion adolescents who will be the next generation of adults, this is a pivotal time in their lives- of challenges and opportunities" (Sohni et al**.**, 2014; Unicef*: The State of the World's Children 2011: Adolescence: An Age of Opportunity).* According to a study done by the WHO (2010), "over 21.6 million women are estimated to undergo unsafe abortions that could be avoided through access to family planning services, and safe abortion care. Safe abortion care has the potential to save 70,000 women and prevent 5 million disabilities annually caused by lack of preconception care. Having seen the effects of lack of preconception." For example, it can be controlled by education on family planning and birth control. The Importance of taking folic acid, thus proper nutrition before pregnancy. Train on importance of use of "vaccines and screenings that may needed, such as Pap test and screenings for sexually transmitted infections (STIs), including HIV before conception., managing health problems, such as diabetes, high blood pressure, thyroid disease, obesity, depression, eating disorders, and asthma before

conception. Find out how pregnancy may affect, or be affected by health problems you have Medicines one may or may not use, including over-the-counter, herbal, and prescription drugs and supplements. Reasons Why to improve one's overall health, such as reaching a healthy weight, making healthy food choices, being physically active, caring for one's teeth and gums, reducing stress, quitting smoking, and avoiding alcohol" (Dean et al., 2014; Women's health, 2016). How to avoid illness during or before pregnancy special care should be done to prevent "hazards in your workplace or home that could harm you or your baby" (WHO, 2012)

Discussing and discouraging the practice with the girl and her parents and/ or partner Screening women and girls for FGM to detect complications Informing women and couples about complications of FGM and about access to treatment Carrying out defibulation of infibulated or sealed girls and women before or early in pregnancy.

The use of tobacco products just before and during pregnancy increases the risk of spontaneous miscarriage, reduced birth weight, placenta prevail, placental abruption, preterm premature rupture of membranes, stillbirth, preterm delivery and congenital malformation (Dobson F., Donald D.Mowlam M.,et al 2012). The risk for most of these conditions has been found to increase with the number of cigarettes smoked, therefore, women who stop smoking during pregnancy are at a lower risk for most of these pathologies (Polasnaka and Hanke). In addition, smoking is an important cause of infertility (Shiverick 2011), therefore, all women who smoke who are planning to become pregnant should be advised by pharmacists and healthcare professionals to stop smoking. Community-based smoking cessation services are available throughout England and these should be offered to women who require this. Children with foetal alcohol spectrum disorders can have learning difficulties, problems with behaviour, physical disability, and emotional and psychiatric problem. Whether or not a baby is

affected mildly or severely, this condition is directly linked to how much and how often a woman drinks during her pregnancy

There is an adverse pregnancy outcomes remain a prevalent health problem in Ethiopia. (Arsue I. T., Hailu D., Woldu G.W., Gebrehenwort H., 2019). Reproductive planning and contraceptive use can prevent unintended pregnancies, unsafe abortions and sexually-transmitted infections in adolescent girls and women (Sohni et al**.,** 2014). They soon get in marriage without preparations and knowledge for pregnancy.

In the context of high maternal morbidity and mortality in Sub-Saharan Africa, only 20% of women receive PCC from all sorts of health care providers (HCPs), most women die out of conditions that can be avoided or prevented by simple practices along the life cycle of all human beings. Such are simply taking a healthy nutrition, starting sexual practices at right age, avoiding FGM, giving girl- children the right nutrients, weaning children at the right time, attaining the right age of marriage, not getting pregnancy too early or too late (Ashaba et al., 2017). According to these studies, the main unmet problem is high rate of Maternal morbidity and mortality in the Sub-Sahara Africa, even in the Kenya.

In the world today, PCC has advanced as well as other medical services but altogether there are poor advances in birth outcomes still observed even in the USA (CDC,2017). Due to lack of knowledge on PCC, failure to comply to PCC guidelines, and thus the rates of unintended pregnancies are high (Jones et al., 2017), whereas globally, the progress towards improving maternal health, especially universal access to sexual and reproductive healthcare, has been slow and uneven (Barriex et al., 2015) thus Women with chronic medical conditions are at increased risk for pregnancy-related complications (Chuang et al,2010).

All women require preconception care especially women living with chronic health conditions such as diabetes, high blood pressure, epilepsy, mental disorders (Coll et al., 2017). These women generally lack the knowledge about preconception care that they really need (Chuang et al., 2010). According to studies done in many places, preconception care has been said to improve and better the maternal and neonatal outcome (Finocchario-Kessler et al., 2009 and Chuang et al., 2010). It should be known that, some foods, habits, and medicines do harm the baby even before he or she is conceived, (Women's Health. Gov, 2012). There is lack of caregiver's knowledge on preconception care and the fertility desires for women.

According to many studies done on PCC, the unmet need for these women is large and many are still dying or losing their dearly awaited young ones or suffer long term conditions e.g. spina bifida, children with alcohol syndrome and obese born babies of good results of can be achieved through reproductive counseling which guarantees improved women's health, their understanding of transmission risks, and the health of their partners and future children (Ayalew et al., 2016; Ashaba et al., 2017). Thus the study Finding out factors associated utilization of preconception care by Women attending Kapsabet Referral Hospital MCH-maternal child health Nandi County.

Reproductive planning and contraceptive use can prevent unintended pregnancies, unsafe abortions and sexually-transmitted infections in adolescent girls and women **(**Sohni et al., 2014**)**. They soon get in marriage without preparations and knowledge for pregnancy.

CHAPTER THREE

RESEARCH METHODS

This chapter deals with, the research design, target population, the Sample and Sampling procedures, research and data collection validity, data analysis and ethical consideration.

The Research Design

To meet the objective of the study where factors associated with utilization of preconception care were studied and described. A cross-sectional study design was utilized.

Target Population

The target population were women of reproductive age 15-45years, who attended Kapsabet Referral Hospital. According to the Nandi county head office census report of 2009, the population of women who attended Kapsabet Referral Hospital were between 230 - 400 among the over 376,477 women in the county, and only 24,000 women in Nandi County delivered in hospitals. Kapsabet referral hospital is found in Kenya, in the Rift valley region, which is found Nandi county, it is located in central Nandi county it is a referral hospital for the whole Nandi county which has 12 sub counties Chesumei, Mosoriot etc.

Target sample size

The researcher used the RAOSOFT sample size calculator to calculate the sample size from a total population of 24,000 women within Nandi County with 5% margin error and 95% confidence level, after calculation 200 women sample was determined.

Sampling Technique

This study used purposive random sampling technique (The researcher chooses the sample based on who they think would be appropriate for the study) to choose 200 women who participated in the study in Kapsabet referral hospital this is because in the purposive random sampling participants were only those who came to hospital within the period of one month. It did not include those who didn't attend.

Research Instruments

The study used self-administered questionnaires with questions given to respondents who answered by ticking their preference answers. The researcher also used oral questions (read what was on the questionnaire) to the respondents who never understood the questions on the questionnaire. The dependent variable was utilization of preconception care services among women of reproductive age. The independent variables included Socio-demographic variables (age, education level, occupation, residence, marital status and religion of the woman), accessibility to preconception services, availability of preconception services, affordability of preconception care

services, previous obstetric problems and the knowledge level on preconception care services.

Validity

The instrument used was a well validated questionnaire which was validated using content validity. Pre-testing of the study tools was done and their validity assessed through expert reviewers (my supervisors). In carrying out this study, the researcher paid very keen attention to the issues of the validity of the research instrument. The researcher worked closely with the supervisors who went through the tools and their suggestions and ideas incorporated.

Reliability

Pre-testing of the questionnaire was done at Pioneer Health Center in Uasin Gishu where 20 questionnaires were administered which was 10% of the sample size. respondents were well reached and informed about the research. This pilot study was used to establish the reliability of the research instrument.

Data Gathering Procedures

The researcher presented the proposal paper to Ethical committee and got permission letter that enabled her to collect data, also was assisted by the university graduate (IREC) study committee who issued a letter of permission to apply research

permit from NARCOSTI (National Commission for Science, Technology and Innovations), then proceeded on for data collection. After applying, the permit came after about four months. Permission from the Kapsabet hospital was gotten from the in charge, lastly permission from the willing participants at the clinic

Two hundred (200) Questionnaires were prepared and administered to the respondents and the researcher distributed them herself and two trained assistants assisted. The study participants were interviewed and given questionnaires to fill and give them back to the researcher and the assistants, or drop them in a given box.

Statistical Treatment of Data

The analytical strategy had three steps. First, the descriptive statistics of preconception care services utilization were presented in the form of numbers and frequencies before combining all the indicators of each type of service (i.e., counselling, health screening, advice against environmental toxins, counselling on lifestyle changes, and vaccination). Second, the differences in preconception care utilization were assessed between the different groups of the participant's characteristics. The Pearson's Chi-Square test was used to assess the differences between these groups. Finally, all the components of utilization of preconception care were combined, and the distribution of the dependent variable was determined (Figure 5).

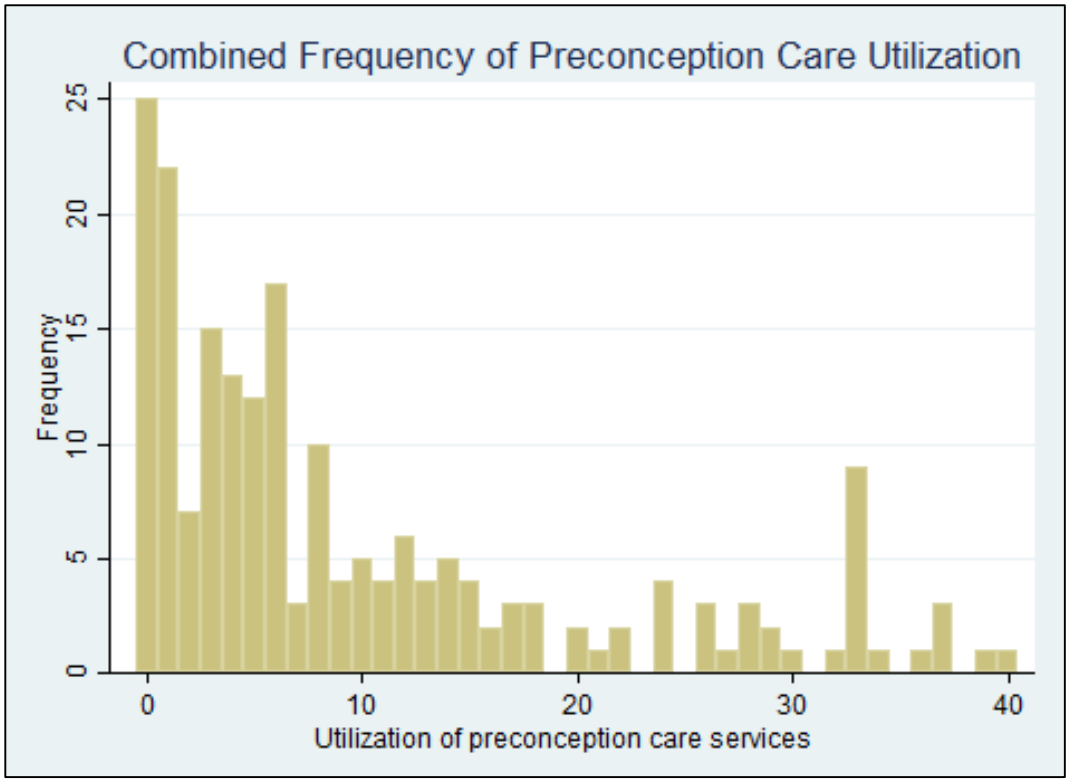

Figure 5. The distribution of the utilization of preconception care services

After the determination of the Poisson distribution, it was found to be skewed to the right with

a zero inflation. Therefore, zero-inflation Poisson regression analysis was chosen to explore the factors associated with utilization of preconception care using the '*zip*' command. The unadjusted and adjusted incidence rate ratios (IRRs)and the 95% confidence intervals (CIs) were then presented in the tables for further interpretation. All the analyses were performed using STATA version 13.1.

Ethical Considerations of the Study

The researcher got approval from the Institutional Research Ethics Committee (IREC) of the University of Eastern Africa, Baraton. After getting the clearance letter, the researcher applied for Research License from NACOSTI. Then The Medical Director and the Hospital Administrator of Kaspsabet Referral Hospital were requested for permission to carry out the research in their Institution and it was granted

The researcher also got consent of the women through the nurses in charge of Maternal Child Health Kapsabet County Referral Hospital by explaining to them the purpose of the study and asked them to give informed consent if they were willing to voluntarily participate in the study.

Two hundred (200) Questionnaires were prepared and were administered to the respondents and the researcher distributed them herself assisted by two research assistants. The exercise took 30days (a month).

The study participants were interviewed and given questionnaires to fill and gave them back to the researcher and the assistants, or dropped them in a given box at their hospital clinic where the researcher and the assistants were waiting.

Each participant was allowed to make an informed consent before being involved in the study and was given a consent form each of them to fill by signing and writing the date after being explained to about the research and its purpose. They also had a right to withdraw from the study anytime without any penalty.

The informants were identified and objectively selected as the subjects who provided information for this study. The informants were kindly requested to provide

the information needed for successful completion of the study. Any information given was kept strictly confidential and also anonymous and utilized only for the purpose for which was intended.

CHAPTER FOUR

PRESENTATION OF FINDINGS, ANALYSIS AND INTERPRETATION

Introduction

This chapter presents the data analysis and presentation of the results which were done according to the study objectives. A total of 200 (100%) women of reproductive age participated in the study through researcher-administered questionnaire.

Level of Preconception Care Utilization

Table 2 presents the descriptive statistics of preconception care utilization. The majority of the participants indicated that they had planned pregnancy (61.0%), and yet the participants who indicated that they utilized preconception services were less than a half in all the indicators. In fact, the highest utilization frequency was experienced on counseling with regards to ‘sexually transmitted infections and HIV’ and family planning and birth spacing’ each at 48.0%, respectively. Moreover, screening of HIV/AIDS was also at 47.5%, while screening for ‘previous premature delivery’ and ‘previous postpartum hemorrhage’ were the lowest at 9.0% and 6.0%, respectively.

Table 2. Descriptive statistics of the utilization of preconception care in Kapsabet County Referral Hospital

Preconception care services	No, *n* (%)	Yes, *n* (%)
Planned for pregnancy	78 (39.0)	122 (61.0)
Ever utilized preconception care	148 (74.0)	52 (26.0)
Counselling before pregnancy		
Smoking, alcohol & drug abuse	143 (71.5)	57 (28.5)
Folic acid supplementation	132 (66.0)	68 (34.0)
Sexually transmitted infections & HIV	104 (52.0)	96 (48.0)
Family planning & birth spacing	104 (52.0)	96 (48.0)
Healthy body weight and diet	129 (64.5)	71 (35.5)
Importance of oral health	139 (69.5)	61 (30.5)
Body piercings & risk of hepatitis C	156 (78.0)	44 (22.0)
Lead, environmental & occupational exposures	160 (80.0)	40 (20.0)
Genetic disorders (plus cystic fibrosis & sickle cell)	155 (77.5)	45 (22.5)
Health screening		
Genetic conditions (sickle cell, fibrosis, thalassemia)	160 (80.0)	40 (20.0)
Infectious diseases (e.g. syphilis, hepatitis C, HIV)	137 (68.5)	63 (31.5)
Blood pressure	110 (55.0)	90 (45.0)
Diabetes	151 (75.5)	49 (24.5)
Rh incompatibility	164 (82.0)	36 (18.0)
HIV/AIDS	105 (52.5)	95 (47.5)
Anemia	132 (66.0)	68 (34.0)
Epilepsy	171 (85.5)	29 (14.5)
Asthma	161 (80.5)	39 (19.5)
Tuberculosis	132 (66.0)	68 (34.0)
Cystic fibrosis	179 (89.5)	21 (10.5)

Preconception care services	**No, *n* (%)**	**Yes, *n* (%)**
Thalassemia	176 (88.0)	24 (12.0)
Previous caesarean section	168 (84.0)	32 (16.0)
Previous premature delivery	182 (91.0)	18 (9.0)
Previous postpartum haemorrhage	188 (94.0)	12 (6.0)
Advice against environmental toxins		
Smoking cessation	154 (77.0)	46 (23.0)
Alcoholism & illegal drugs	147 (73.5)	53 (26.5)
Household chemicals (paint thinners, solvents, pesticides)	158 (79.0)	42 (21.0)
Radiation exposure	154 (77.0)	46 (23.0)
Lifestyle changes		
Recommended regular moderate exercise	144 (72.0)	56 (28.0)
Avoid hyperthermia (hot tubs)	156 (78.0)	44 (22.0)
Caution against obesity & underweight	142 (71.0)	58 (29.0)
Risks of nutritional deficiencies	130 (65.0)	70 (35.0)
Avoid overuse of Vitamins A & D and Caffeine	149 (74.5)	51 (25.5)
Screen for domestic violence	149 (74.5)	51 (25.5)
Counsel on use of over-the-counter medications	155 (77.5)	45 (22.5)
Vaccination		
Rubella Seronegativity	177 (88.5)	23 (11.5)
Tetanus	106 (53.0)	94 (47.0)
Human Papillomavirus	186 (93.0)	14 (7.0)
Influenza	182 (91.0)	18 (9.0)
Varicella	189 (94.5)	11 (5.5)

Utilization of at least one preconception care service in different categories of services are presented in Table 3. Sixty-one percent of the participants indicated that they had utilized at least one counselling service. The majority of those who utilized at least counselling service were those above 30 years (72.1%, $p \leq 0.100$), those who were formerly married (68.2%, $p = 0.092$), those with 4 or more members in the family (70.7%), those who were using pesticides (74.1%), and those who were in their third or fourth pregnancy.

The results indicated that those who utilized at least one screening service were above 75% (Table 2). The majority of those above 30 years (86.9%), had more than 4 family members (85.3%), were using pesticides (84.5%), and were in their third (88.3%) or fourth (83.3%) pregnancies were likely to use at least one screening service. However, utilization of at least one service against environmental toxins was the least (31.5%). Only two indicators were statistically significant – that is, those who had insurance (39.4%) and those who were using pesticides (51.7%).

With regard to counselling on lifestyle changes, those who were using pesticides (53.5%), those who were not smoking (45.0%), and those who had not lost any pregnancy (46.0%) were more likely to get at least one counselling on lifestyle changes. On the other hand, singles (56.1%), the Nandi ethnic group (63.2%), those who had insurance cover (60.5%), those who used pesticides (70.7%), and those who had not lost any pregnancy (58.8%) were more likely to be vaccinated.

Table 3. Descriptive statistics of the utilization of at least one preconception care service, by different participant characteristics

Characteristics	Total	Utilized at least one preconception care service, *n* (%)				
		Counselling	Screening	Toxins	Lifestyle	Vaccination
Utilized at least one	200	122 (61.0)	153 (76.5)	63 (31.5)	87 (43.5)	104 (52.0)
Age group		***p* = 0.100**	***p* = 0.069**	*p* = 0.117	*p* = 0.745	*p* = 0.778
< 25	81	45 (55.6)	59 (72.8)	20 (24.7)	34 (42.0)	44 (54.3)
25 – 30	58	33 (56.9)	41 (70.7)	18 (31.0)	24 (41.4)	28 (48.3)
> 30	61	44 (72.1)	53 (86.9)	25 (41.0)	29 (47.5)	32 (52.5)
Marital status		***p* = 0.092**	*p* = 0.137	*p* = 0.300	*p* = 0.885	***p* = 0.048**
Single	41	19 (46.3)	27 (65.8)	17 (41.5)	19 (46.3)	23 (56.1)
Married	137	88 (64.2)	107 (78.1)	40 (29.2)	58 (42.3)	75 (54.7)
Formerly married	22	15 (68.2)	19 (86.4)	6 (27.3)	10 (45.5)	6 (27.3)
Religion		*p* = 0.958	*p* = 0.824	*p* = 0.996	*p* = 0.558	*p* = 0.130
Catholic	45	28 (62.2)	32 (71.1)	15 (33.3)	18 (40.0)	27 (60.0)
Anglican	44	25 (56.8)	36 (81.8)	13 (29.6)	16 (36.4)	24 (54.5)
SDA	45	27 (60.0)	35 (77.8)	14 (31.1)	24 (53.3)	17 (37.8)
Protestant	40	26 (65.0)	30 (75.0)	13 (32.5)	17 (42.5)	19 (47.5)
Other	26	16 (61.5)	20 (76.9)	8 (30.8)	12 (46.2)	17 (65.4)
Family size		***p* = 0.030**	***p* = 0.022**	*p* = 0.169	*p* = 0.484	*p* = 0.559
≤ 4	125	69 (55.2)	89 (71.2)	35 (28.0)	52 (41.6)	63 (50.4)
> 4	75	53 (70.7)	64 (85.3)	28 (37.3)	35 (46.7)	41 (54.7)
Ethnicity		*p* = 0.614	*p* = 0.627	*p* = 0.420	*p* = 0.467	***p* = 0.063**
Kalenjin	76	50 (65.7)	58 (76.3)	29 (38.2)	35 (46.1)	48 (63.2)

Characteristics	Total	Utilized at least one preconception care service, *n* (%)				
		Counselling	Screening	Toxins	Lifestyle	Vaccination
Luhya	62	34 (54.8)	45 (72.6)	17 (27.4)	22 (35.5)	31 (50.0)
Luo	22	14 (63.6)	19 (86.4)	7 (31.8)	10 (45.5)	9 (40.9)
Other	40	24 (60.0)	31 (77.5)	10 (25.0)	20 (50.0)	16 (40.0)
Residence		$p = 0.509$	$p = 0.340$	$p = 0.258$	$p = 0.194$	$p = 0.454$
Urban	93	59 (63.4)	74 (79.6)	33 (35.5)	45 (48.4)	51 (54.8)
Rural	107	63 (58.9)	79 (73.8)	30 (28.0)	42 (39.3)	53 (49.5)
Education		$p = 0.425$	$p = 0.160$	$p = 0.119$	$p = 0.114$	$p = 0.120$
Primary and below	53	30 (56.6)	37 (69.8)	12 (22.6)	17 (32.1)	27 (50.9)
Secondary	88	52 (59.1)	66 (75.0)	27 (30.7)	44 (50.0)	40 (45.5)
Tertiary	59	40 (67.8)	50 (84.8)	24 (40.7)	26 (44.1)	37 (62.7)
Occupation		$p = 0.724$	$p = 0.839$	$p = 0.455$	$p = 0.609$	$p = 0.970$
Unemployed	55	35 (63.6)	43 (78.2)	16 (29.1)	24 (43.6)	30 (54.6)
Tech/prof/man	41	27 (65.9)	33 (80.5)	17 (41.5)	15 (36.6)	21 (51.2)
Sales/clerical	48	29 (60.4)	36 (75.0)	15 (31.3)	20 (41.7)	25 (52.1)
Other	56	31 (55.4)	41 (73.2)	15 (26.8)	28 (50.0)	28 (50.0)
Insurance cover		$p = 0.289$	$p = 0.303$	$\mathbf{p = 0.044}$	$p = 0.422$	$\mathbf{p = 0.047}$
No	119	69 (58.0)	88 (74.0)	31 (26.1)	49 (41.2)	55 (46.2)
Yes	81	53 (65.4)	65 (80.3)	32 (39.5)	38 (46.9)	49 (60.5)
Use pesticides		$\mathbf{p = 0.015}$	$\mathbf{p = 0.089}$	$\mathbf{p < 0.001}$	$\mathbf{p = 0.070}$	$\mathbf{p < 0.001}$
No	142	79 (55.6)	104 (73.2)	33 (23.2)	56 (39.4)	63 (44.4)
Yes	58	43 (74.1)	49 (84.5)	30 (51.7)	31 (53.5)	41 (70.7)

Characteristics	Total	Utilized at least one preconception care service, *n* (%)				
		Counselling	Screening	Toxins	Lifestyle	Vaccination
Smoke cigarettes		$p = 0.732$	$p = 0.926$	$p = 0.540$	$\mathbf{p = 0.045}$	$p = 0.642$
No	191	117 (61.3)	146 (76.4)	61 (31.9)	86 (45.0)	100 (52.4)
Yes	9	5 (55.6)	7 (77.8)	2 (22.2)	1 (11.1)	4 (44.4)
Drink alcohol		$p = 0.743$	$p = 0.548$	$p = 0.846$	$p = 0.221$	$p = 0.149$
No	183	111 (60.7)	141 (77.1)	58 (31.7)	82 (44.8)	98 (53.6)
Yes	17	11 (64.7)	12 (70.6)	5 (29.4)	5 (29.4)	6 (35.3)
Has previously delivered		$p = 0.403$	$p = 0.102$	$p = 0.930$	$p = 0.934$	$p = 0.102$
No	50	28 (56.0)	34 (68.0)	16 (32.0)	22 (44.0)	21 (42.0)
Yes	150	94 (62.7)	119 (79.3)	47 (31.3)	65 (43.3)	83 (55.3)
Has lost pregnancy		$p = 0.775$	$p = 0.660$	$p = 0.488$	$\mathbf{p = 0.069}$	$\mathbf{p = 0.078}$
No	166	102 (61.5)	126 (75.9)	54 (32.5)	77 (46.4)	91 (54.8)
Yes	34	20 (58.8)	27 (79.4)	9 (26.5)	10 (29.4)	13 (38.2)
Current pregnancy		$\mathbf{p = 0.010}$	$\mathbf{p = 0.010}$	$p = 0.343$	$p = 0.388$	$p = 0.846$
1^{st}	46	22 (47.8)	29 (63.0)	13 (28.3)	15 (32.6)	23 (50.0)
2^{nd}	58	30 (51.7)	41 (70.7)	14 (24.1)	27 (46.6)	32 (55.2)
3^{rd}	60	43 (71.7)	53 (88.3)	23 (38.3)	29 (48.3)	29 (48.3)
$\geq 4^{th}$	36	27 (75.0)	30 (83.3)	13 (36.1)	16 (44.4)	20 (55.6)

Factors Associated with Utilization of Preconception Care

Table 4 presents factors that are associated with utilization of preconception care services. Those who were above 30 years were at a higher rate of utilization of preconception care (IRR = 1.14; 95% CI: 1.03 – 1.27) than those who were less than 25 years before adjustment but after adjusting for all the variables, the difference attenuated. However, marital status was statistically significant before and after adjustment. Those who were married and those who were formerly married were at 32% and 29% less likely to utilize preconception care than the singles.

Nevertheless, the results indicate that those who were affiliated to SDA and protestant churches were 1.52 and 1.48 times at higher rate of utilization of preconception care that those who were affiliated to Roman Catholic church. Also, those who had more than 4 family members were 24% more likely to utilize preconception care than those who were less than or equal to 4 family members, before and after adjustment. All the other ethnic groups were found to be less likely to utilize preconception care than the Kalenjin ethnic group, with the Luhya, Luo and others being at 0.75, 0.82 and 0.70 times less likely, respectively.

The results also revealed that those who were dwelling in rural areas were at 22% lesser rate of preconception care utilization that their urban counterparts before and after adjusting for all the variables. The women who had high school education (IRR = 1.50; 95% CI: 1.30 – 1.73) and those with tertiary education (IRR = 1.42; 95% CI: 1.20 – 1.67) were more likely to utilize preconception care than those who had

primary education and below. Yet, occupation and insurance cover were only statistically significant before adjusting for all the variables.

The women who were using pesticides were 2.14 times at higher rate of utilization than those who were not before adjustment, and after adjustment, the rate slightly increased to 2.22 times. However, those who were drinking alcohol (IRR = 0.83; 95% CI: 0.67 – 1.02), has delivered previously (IRR = 0.82; 95% CI: 0.71 – 0.96) and had lost a pregnancy (IRR = 0.87; 95% CI: 0.75 – 1.01) were less likely to utilize preconception care than those who were not drinking alcohol, had not delivered and had not lost pregnancy, respectively. The women who were in their second pregnancies and higher were at a higher rate of preconception care utilization than those who were in their first pregnancy.

Table 4. Unadjusted and adjusted zero-inflated Poisson regression of the utilization of preconception care service among women at Kapsabet County Referral Hospital

Characteristics	Incidence rate ratio (95% CI)	
	Crude	Adjusted
Age group		
< 25	1	1
25 – 30	1.07 (0.96, 1.20)	1.09 (0.95, 1.24)
> 30	1.14 (1.03, 1.27)**	1.06 (0.92, 1.21)
Marital status		
Single	1	1
Married	0.78 (0.70, 0.87)****	0.68 (0.60, 0.77)****
Formerly married	0.60 (0.50, 0.72)****	0.71 (0.58, 0.87)****
Religion		
Catholic	1	1
Anglican	0.94 (0.82, 1.07)	1.03 (0.89, 1.19)
SDA	1.12 (0.98, 1.27)*	1.52 (1.31, 1.76)****
Protestant	1.11 (0.97, 1.27)	1.48 (1.28, 1.72)****
Other	0.93 (0.80, 1.09)	1.08 (0.90, 1.28)
Family size		
≤ 4	1	1
> 4	1.24 (1.14, 1.36)****	1.24 (1.11, 1.39)****
Ethnicity		
Kalenjin	1	1
Luhya	0.68 (0.61, 0.75)****	0.75 (0.66, 0.86)****
Luo	0.97 (0.84, 1.12)	0.82 (0.70, 0.97)**
Other	0.80 (0.70, 0.90)****	0.70 (0.60, 0.81)****

Characteristics	Incidence rate ratio (95% CI)	
	Crude	Adjusted
Residence		
Urban	1	1
Rural	0.77 (0.71, 0.84)****	0.77 (0.68, 0.86)****
Education		
Primary and below	1	1
Secondary	1.35 (1.19, 1.52)****	1.50 (1.30, 1.73)****
Tertiary	1.64 (1.45, 1.86)****	1.42 (1.20, 1.67)****
Occupation		
Unemployed	1	1
Tech/prof/man	1.08 (0.96, 1.23)	0.88 (0.75, 1.03)
Sales/clerical	1.19 (1.05, 1.34)***	1.11 (0.96, 1.29)
Other	0.87 (0.77, 0.98)**	0.97 (0.84, 1.11)
Insurance cover		
No	1	1
Yes	1.41 (1.29, 1.54)****	1.06 (0.95, 1.18)
Use pesticides		
No	1	1
Yes	2.14 (1.96, 2.34)****	2.22 (2.00, 2.46)****
Smoke cigarettes		
No	1	1
Yes	0.62 (0.47, 0.82)****	0.87 (0.64, 1.18)
Drink alcohol		
No	1	1
Yes	0.67 (0.55, 0.81)****	0.83 (0.67, 1.02)*
Has previously delivered		

Characteristics	Incidence rate ratio (95% CI)	
	Crude	Adjusted
No	1	1
Yes	1.00 (0.90, 1.11)	0.82 (0.71, 0.96)**
Has lost pregnancy		
No	1	1
Yes	0.81 (0.71, 0.92)****	0.87 (0.75, 1.01)*
Current pregnancy		
1st pregnancy	1	1
2nd pregnancy	1.01 (0.88, 1.16)	1.31 (1.09, 1.56)***
3rd pregnancy	1.14 (1.01, 1.30)**	1.23 (1.02, 1.49)**
≥ 4th pregnancy	1.25 (1.09, 1.43)***	1.42 (1.16, 1.73)****

* $p \leq 0.10$; ** $p \leq 0.05$; *** $p \leq 0.01$; **** $p \leq 0.001$

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

Introduction

The chapter discusses the findings and relates them to literature review, and conclusions and findings. The first part discusses utilization of preconception care women in Kapsabet Referral Hospital, the second part discusses the factors influencing the utilization of preconception care among women clients attending Kapsabet.

Discussion

Level of utilization of preconception care

The finding of the study showed that the level of utilization of preconception care among women attending Kapsabet Mother and child health, was low since majority of women indicated that they had planned their pregnancy, but less than half of the participants had utilized all the preconception indicators (such indicators are counselling with regards to ‘sexually transmitted infections and HIV, family planning and birth spacing’ each at 48.0%, respectively. Moreover, screening of HIV/AIDS was also at 47.5%, while screening for ‘previous premature delivery’ and ‘previous postpartum haemorrhage were the lowest at 9.0% and 6.0%, respectively.)

, this concurs with the study done by sipkins and voorst in 2019 that indicated that pregnancy o counseling with regards to sexually transmitted infection and HIV, family planning birth spacing, screening of HIV/AIDS was also at 47.5%, while screening for 'previous premature delivery' and 'previous postpartum hemorrhage lowest at 9.0% and 6.0%, respectively. Outcomes were still poor due to low utilization of preconception care due to lack of awareness.

Similarly, study done in Ethiopia by Arseu et al. found that there were still adverse outcomes on pregnancies thus the study revealed poor utilization PCC of only 18.2% which was a very small percentage

Ayalew (2017) also in his study, he showed that the level of preconception utilization, in sub-sahara-Africa was poor which was associated to low levels of economic status especially, in Zambia ,Srilanka, Nigeria,Sudan are among the low- and middle-income countries showed the level of utilization was low which he associated to lack of knowledge likewise a study was done in Kenya by the Kenya Demographic Health Survey showed that 95%of women never utilized only they found themselves in MCH during a prenatal visit hence poor pregnancy outcomes (https//www.cdc.gov/reproductivehealth/marternalhealth/severemater/morbidity hmtl).

As seen in the study the highest utilization frequency was experienced on counselling with regards to 'sexually transmitted infections and HIV, this is because women contemplating conceptions are very thoughtful about the nature of the child to be delivered and the burden experienced during pregnancy thus women would want to know their status, most of them research on pregnancy hence go for counselling and many women are already using family methods this brings the experience FP .A study

done by Lassi et al states STI can affect the chances of getting pregnant, as well as the baby hence a women concern (Lassi et al., 2014), and family planning and birth spacing also high in these, these is because many women are already using family method thus they would go for counsel, also screening of HIV/AIDS was also at 47.5% many are aware of the seriousness of HIV/AIDS thus would want to prevent mother to child transmission Women with special needs require much more preconception care as they affect pregnancy this would make want to their status (Women's Health. Gov. 2012) while screening for 'previous premature delivery' and 'previous postpartum haemorrhage were the lowest. This is in contrast to a study done by Lassi et al. "Born Too Soon: Care before and between pregnancy to prevent preterm births: from evidence to action", states that people having experienced such would seek preconception care due to fear of repeat but it is not so in my study where they did not seek counsel.

Utilization of at least one preconception care service

Still in the utilization of Preconception care service, at least 61% utilized one PCC counselling services service, it showed that the most of the people who used counselling service were 30 years thus concurred with a study done and those formerly married followed these is a group of women who are lack enough support. Those who have more than four members in a family utilized at least one PCC service which probably family planning to ensure the number of members does not increase. The study also revealed that those who used pesticides had greater number who used of preconception care service these was similar to a study according to Thaila's study "*Before the beginning: environmental exposures and reproductive and obstetrical*

outcomes" that stated there is an increased agreement that Preconception exposure to environmental toxins that can adversely affect fertility (Thaila n.d.).

Counselling with regards on lifestyle changes, those who were using pesticides those who were not smoking and those who had not lost any pregnancy were more likely to get at least one counselling on lifestyle changes these contrasts a study done by Joyce 2019 that states that those who had lost pregnancy sought for preconception care for better future pregnancy outcomes.

Factors Associated with Utilization of Preconception Care

The study found out that age was one of the demographic factors whereas people who were over 30years takes the lead in utilization of preconception care at IRR = 1.14 (95% CI: 1.03-1.27) this is in agreement with a study done by Lassi (2014) which state that they are at high risk associated with maternal age thus must seek. Marital status in this study was not significant a contrast with study done in Ruiru Joyce C., the study also reveals that those who were affiliated to SDA and protestant churches were 1.52 and 1.48 times at higher rate of utilization of preconception care that those who were affiliated to Roman Catholic church.i think the like using teaching about most biblical teaching such as PCC care were mother Samson was given instruction on what not to use during conception and even before(Judges 13:3-5)those who had more than 4 family members were 24% more likely to utilize preconception care than those who were less than or equal to 4 family members, before and after adjustment .This is due to the burden of life already experienced they wouldn't want to have more members.

Conclusion

The outcome of this study showed that women's utilization of preconception care is low. A woman's age, educational status (knowledge about preconception care services). It indicated that being married; having a high educational level, Therefore, establishing preconception care strategies which can address all the components of preconception care and understanding the views of reproductive age women's and care providers will be essential when designing effective implementation strategies for improving delivery and uptake of preconception.

Recommendation

Further study should be done to isolate factors associated to preconception and study each factor and how it is associated with utilization of preconception care. And it is example how age as a factor affects utilization of preconception care.

Further study on the availability of the preconception care and awareness among many who need it most as women and the young adolescents.

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APPENDICES

Appendix I: Survey Questionnaire

INFORMED CONSENT FORM

Dear respondent

I **H**annah Ndungwa Nyabuto, a Master of Public Health student at the University of Eastern Africa, Baraton, Department of Public Health is conducting a research with the purpose of investigating **Factors Associated Preconception Care Among Women Attending Kapsabet County Referral Hospital, Nandi County Kenya**.

Youhave been selected as a respondent in this study where you will play an important role. I request you to spare 15-20 minutes of your time and fill the questionnaire that is provided alongside this consent. Participation in this study is voluntary and withdrawal is also at will. This is therefore to request you to respond suitably to the questions given below. Express your views freely without any fear. Please note that the information you will give will be confidential and will be used for this study only. In case of any clarification, please feel free to ask.

PARTICIPANT

I have read and understood what this study is about and I therefore voluntarily consent to participate:

Participant's Signature_____Date _____

Investigator: Ihave explained this study to the above subject and have sought his/her understanding for informed consent.

Investigator's Signature_____ Date _____

Hanna Ndungwa Nyabuto

Department of Public Health, University of Eastern Africa, Baraton.

Questionnaire for the Respondents

Kindly fill the questionnaire. Please don't put your name anywhere on the questionnaire. This information will be treated with confidentiality. Please tick (☑) the most appropriate in the box.

Section A: Demographic Data

1. In which year were you born? _____
2. What is your marital status?

   ☐ Single ☐ Married-Monogamy ☐ Married-Polygamy

   ☐ Widow (er) ☐ Separated/divorced
3. What is your religious affiliation?

   ☐ Roman Catholic ☐Anglican ☐ SDA ☐ Pentecostal

   ☐ Muslim ☐Other_____
4. How many people in the family? _____
5. What is your ethnicity?

   ☐Kalenjin ☐Luhya ☐Luo ☐Kikuyu ☐Kisii ☐

   Other_____
6. What is your residence in Kapsabet county? ☐Urban ☐Rural
7. What is your level of education?

   ☐ No education ☐ Primary ☐Secondary ☐ Tertiary

   (College/university)
8. What is your occupation?

   ☐ Unemployed ☐ Technician/professional/managerial ☐

   Clerical duties

☐ Sales person ☐ Farming ☐ Household/domestic worker ☐ Skilled labour

☐ Unskilled labour ☐ Other (specify)_____

9. Do you have health insurance cover? ☐ No ☐ Yes
10. Do you use pesticides/indoor spray at home? ☐ No ☐ Yes
11. Do you smoke cigarettes? ☐ No ☐ Yes
12. Do you consume alcohol? ☐ No ☐ Yes
13. Have you ever given birth? ☐ No ☐ Yes
14. Have you lost any of your pregnancy? ☐ No ☐ Yes
15. If pregnant now, what is the number of the current pregnancy?

☐1st born ☐2nd born ☐3rd born ☐4th born ☐5th born and above

Section B: Preconception Care

16. Have you ever planned for any of your pregnancy? ☐ No ☐ Yes
17. Have you ever utilized preconception care beforegetting pregnant? ☐ No ☐ Yes
18. Were you counselled on the following before getting pregnant?
    a. Smoking, alcohol abuse and other drug use. ☐ No ☐ Yes
    b. Folic acid supplementation, 400 mcg daily. ☐ No ☐ Yes
    c. Sexually transmitted infections including HIV. ☐ No ☐ Yes
    d. Family planning and pregnancy spacing. ☐ No ☐ Yes
    e. Maintaining healthy body weight and diet. ☐ No ☐ Yes
    f. Importance of oral health. ☐ No ☐ Yes
    g. Increased risk of hepatitis C in those with body piercings. ☐ No ☐ Yes
    h. Lead and other environmental and occupational exposures. ☐ No ☐ Yes

i. Genetic disorders (including cystic fibrosis and sickle cell). ☐ No ☐ Yes

19. Were you screened for the following health conditions?

a. Genetic conditions (e.g. sickle cell, fibrosis, thalassemia) ☐ No ☐ Yes

b. Infectious diseases (e.g. syphilis, hepatitis C, HIV) ☐ No ☐ Yes

c. Medical conditions screened:

i. Blood pressure ☐ No ☐ Yes

ii. Diabetes ☐ No ☐ Yes

iii. Rh incompatibility ☐ No ☐ Yes

iv. HIV ☐ No ☐ Yes

v. Anaemia ☐ No ☐ Yes

vi. Epilepsy ☐ No ☐ Yes

vii. Asthma ☐ No ☐ Yes

viii. Tuberculosis ☐ No ☐ Yes

ix. Cystic fibrosis ☐ No ☐ Yes

x. Thalassemia ☐ No ☐ Yes

xi. Complications from previous pregnancies (if any)

1. Caesarean section ☐ No ☐ Yes

2. Premature delivery ☐ No ☐ Yes

3. Postpartum haemorrhage ☐ No ☐ Yes

20. Were you advised against the following environmental toxins?

a. Smoking cessation ☐ No ☐ Yes

b. Use of alcoholism and use of illegal drugs ☐ No ☐ Yes

c. Occupational exposures(e.g. herbicides used in farms) ☐ No ☐ Yes

d. Household chemicals (paint thinners, solvents, pesticides) ☐ No ☐ Yes

e. Radiation exposure in early pregnancy ☐ No ☐ Yes

21. Were you assessed/counselled on the following lifestyle changes?

a. Recommended regular moderate exercise ☐ No ☐ Yes

b. Avoid hyperthermia (hot tubs) ☐ No ☐ Yes

c. Caution against obesity and being underweight ☐ No ☐ Yes

d. Risks of nutritional deficiencies ☐ No ☐ Yes

e. Avoiding overuse ofVitamins A and D and Caffeine ☐ No ☐ Yes

f. Screen for domestic violence ☐ No ☐ Yes

g. Counsel on the use of over-the-counter medications ☐ No ☐ Yes

22. Were you vaccinated/immunizedfor the following?

a. Rubella Seronegativity ☐ No ☐ Yes

b. Tetanus ☐ No ☐ Yes

c. Human Papillomavirus ☐ No ☐ Yes

d. Influenza ☐ No ☐ Yes

e. Varicella ☐ No ☐ Yes

Appendix II. Curriculum Vitae

PERSONAL DETAILS	
Name	Hannah NdungwaNyabuto
Sex	Female
Marital status	Married
Date of Birth	11/11/ 1971
Nationality	Kenyan
Religion	Christian
Profession	Teacher
Postal address	P.O BOX 20 BARATON
Telephone	0713953455
E-mail	hannahnyabuto@gmail.com

EDUCATION BACKGROUND

UNIVERSITY EDUCATION

Period	2004- 2011
Institution	University of Eastern Africa, Baraton
Degree Awarded	BSc In Foods and Nutrition
Period	2015 to date
Institution	University of Eastern Africa, Baraton
Degree to be awarded	Master in Public Health (MPH)
College	College Education
Period	1991 – 1993

Institution	AHITI- Training college
Award	Diploma

SECONDARY EDUCATION

Period (from to...)	1986 – 1989
Institution	Mutitu SDA Secondary School
Certificate Awarded	Kenya Certificate of Secondary Education (KCSE)
Grade	C(Plus)

PRIMARY EDUCATION

Period (from to...)	1979-1986
Institution	Mulaani Primary School
Certificate Awarded	Kenya Certificate of Primary Education (KCPE)
Mean Grade	B

PROFESSIONAL EXPERIENCE

Period (from to.1989-1993..)	Animal health assistant.
Organization	Self employed
Position	AHA
Period(from 1991-1995)	Teacher
Organisation	Massi SDA Sec school
Position	HOD TECHNICALS
PERIOD 2011-2012	Teacher
Organisation	Kaptel girls
Position	HOD GUIDANCE / H/S BIOLOGY TEACHER

LANGUAGE SKILLS

Language	WRITTEN	SPOKEN
English	Very Good	Very Good
Kiswahili	Very good	Very Good
Kamba	Very good	Very good

CONFERENCE ATTENDED

11th – 13th July 2017 @ UEAB 4th Annual Baraton International Interdisciplinary Research Conference	Theme : Transforming the future Future through Research and Innovation Solutions

COMPUTER SKILLS

Operating System	Windows Xp, windows vista UNIX
Web programs	HTML, VB script, javascropt

OTHER SKILLS

- Good public skills
- Good communication skills
- Good Health Promoter and Educator

HOBBIES

Reading, listening to Christian music, travelling, reading, singing,

REFEREES

	REFEREE 1	REFEREE 2	REFEREE 3
Full Name	Dr. Dorothy Onyango.	Dr. Miyayo Lameck	Aseneth Barango.
Position	Senior lecturer	Senior lecturer UEAB	Lecturer UEAB
Organization	University of Eastern Africa Baraton.	University of Eastern Africa Baraton.	University of Eastern Africa Baraton.
Mail Address	2500 ,ELDORET	2500, ELDORET	2500, ELDORET
Telephone	0703274803	0723636953	0721884318
Email	-	-	-

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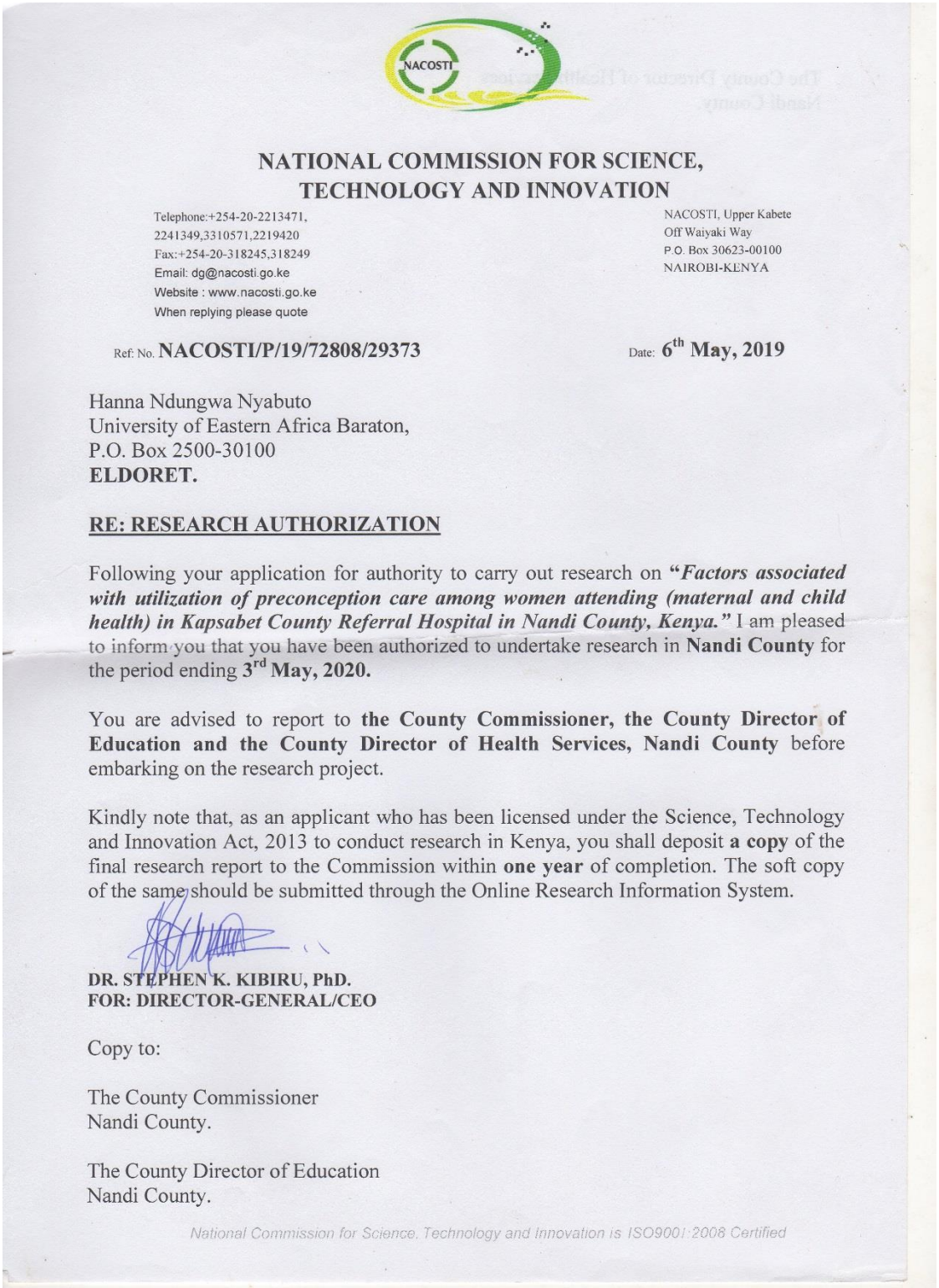
Appendix III: Permit for Data Collection (Nacosti)



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When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/19/72808/29373**

Date: **6th May, 2019**

Hanna Ndungwa Nyabuto
University of Eastern Africa Baraton,
P.O. Box 2500-30100
ELDORET.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Factors associated with utilization of preconception care among women attending (maternal and child health) in Kapsabet County Referral Hospital in Nandi County, Kenya."*** I am pleased to inform you that you have been authorized to undertake research in **Nandi County** for the period ending **3rd May, 2020.**

You are advised to report to **the County Commissioner, the County Director of Education and the County Director of Health Services, Nandi County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

DR. STEPHEN K. KIBIRU, PhD.
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Nandi County.

The County Director of Education
Nandi County.

National Commission for Science, Technology and Innovation is ISO9001:2008 Certified

Appendix IV: Nacosti Research License

THIS IS TO CERTIFY THAT:
MISS. HANNA NDUNGWA NYABUTO
of UNIVERSITY OF EASTERN AFRICA, BARATON, 2500-30100 ELDORET,has been permitted to conduct research in *Nandi County*

Permit No : NACOSTI/P/19/72808/29373
Date Of Issue : 6th May,2019
Fee Recieved :Ksh 1000

on the topic: *FACTORS ASSOCIATED WITH UTILIZATION OF PRECONCEPTION CARE AMONG WOMEN ATTENDING (MATERNAL AND CHILD HEALTH) IN KAPSABET COUNTY REFERRAL HOSPITAL IN NANDI COUNTY, KENYA*

for the period ending:
3rd May,2020

.....
Applicant's Signature

.....
Director General
National Commission for Science, Technology & Innovation

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014.

CONDITIONS

1. The License is valid for the proposed research, location and specified period.
2. The License and any rights thereunder are non-transferable.
3. The Licensee shall inform the County Governor before commencement of the research.
4. Excavation, filming and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
5. The License does not give authority to transfer research materials.
6. NACOSTI may monitor and evaluate the licensed research project.
7. The Licensee shall submit one hard copy and upload a soft copy of their final report within one year of completion of the research.
8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice.

National Commission for Science, Technology and innovation
P.O. Box 30623 - 00100, Nairobi, Kenya
TEL: 020 400 7000, 0713 788787, 0735 404245
Email: dg@nacosti.go.ke, registry@nacosti.go.ke
Website: www.nacosti.go.ke

REPUBLIC OF KENYA

NACOSTI

National Commission for Science, Technology and Innovation

RESEARCH LICENSE

Serial No.A 24499

CONDITIONS: see back page

Appendix V: Permit For Data Collection (County Commissioner)

THE PRESIDENCY

MINISTRY OF INTERIOR AND COORDINATION OF NATIONAL GOVERNMENT

Tel: 053 5252621, 5252003, Kapsabet
Fax No. 053 – 5252503
E-mail:
nandlcountycommissioner@gmail.com
When replying, please quote

Ref: No. NC.EDU/4/1/VOL.V(248)

County Commissioner's Office,
Nandi County
P.O. Box 30,
KAPSABET.

14th May, 2019

Hanna Ndungwa Nyabuto
University of Eastern Africa Baraton,
P.O. Box 2500 - 30100
ELDORET.

RE: RESEARCH AUTHORIZATION

This is in reference to letter No. NACOSTI/P/19/72808/29373 dated 8th May, 2019 from the Director General/CEO, National Commission for Science, Technology and Innovation on the above subject matter.

You are hereby authorized to conduct a research on **"Factors associated with utilization of preconception care among women attending (maternal and child health) in Kapsabet County Referral Hospital in Nandi County"** for the period ending **3rd May, 2020.**

Wishing you all the best.

THE COUNTY COMMISSIONER NANDI.

J.O. OWINO
For: COUNTY COMMISSIONER,
NANDI.

Appendix VI: Permit For Data Collection (Ministry Of Education)

REPUBLIC OF KENYA

MINISTRY OF EDUCATION
STATE DEPARTMENT FOR EARLY LEARNING AND BASIC EDUCATION

Email: cdenandicounty@yahoo.com
When replying please quote

COUNTY DIRECTOR OF EDUCATION,
NANDI
P.O BOX 36 – 30300,
KAPSABET.

Ref:NDI/CDE/RESEARCH/1/VOL.II/168

14TH May, 2019

Hanna Ndungwa Nyabuto
University of Eastern Africa Baraton,
P.o Box 2500-30100
ELDORET.

RE: RESEARCH AUTHORIZATION.

Reference is made to the National Commission for Science, Technology and Innovation's letter Ref:
No. NACOSTI/P/19/72808/29373 dated **6th May, 2019.**

The above named person has been granted permission by the County Director of Education to carry out research on "***Factors associated with utilization of preconception care among women attending (maternal and child health) in Kapsabet County Referral Hospital"*** in Nandi county for the period ending **3rd May, 2020.**

Kindly provide her all necessary support she requires.

For: County Director of Education NANDI COUNTY

Evans Ondara
For: County Director of Education,
NANDI COUNTY.

Appendix VII: Pilot Study Approval

REPUBLIC OF KENYA
COUNTY GOVERNMENT OF UASIN GISHU
DEPARTMENT OF EDUCATION, CULTURE, YOUTH AFFAIRS, SOCIAL SERVICES & SPORTS
OFFICE OF CHIEF OFFICER EDUCATION, CULTURE AND SOCIAL SERVICES

Emai: @uasingishu.go.ke

Tel. NOs: 053 2033737
+254-053-2016605
+254-053-2016604

Fax:
Website: www.uasingishu.go.ke

THE CHAMPIONS

When Replying, Please Address to:
Chief Officer, Education, Culture and Social Services
County Government of
Uasin Gishu
P. O Box 40-30100
ELDORET-KENYA

15th May, 2019

HANNA N. NYABUTO
UNIVERSITY OF EASTERN AFRICA BARATON
P.O.BOX 2500
ELDORET

RE: AUTHORITY TO DO A PILOT STUDY IN PIONEER HEALTH CENTRE

Following your letter of request to do a pilot study in Pioneer Health Centre "on **Factors associated with utilization of preconception care among women attending (Maternal and child health).**"

You are hereby given authority to do so.

UASIN GISHU COUNTY
CHIEF OFFICER
Date.....
Sign.....
EDUCATION, CULTURE & SOCIAL SERVICES

Jane Njuguna
Chief Officer
EDUCATION, CULTURE AND SOCIAL SERVICES

Copy: COUNTY SECRETARY