UTILIZATION OF PRECONCEPTION CARE AMONG WOMEN OF REPRODUCTIVE AGE ATTENDING THIKA LEVEL FIVE HOSPITAL IN KIAMBU COUNTY, KENYA

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DECLARATION

Student Declaration

"This thesis is my original work and has not been presented for a degree in any other university".

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This thesis has been submitted with our approval as the university supervisors.

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DEDICATION

This thesis is dedicated to all women of reproductive age as they embrace the use of preconception care services to promote their reproductive health.

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ABBREVIATIONS AND ACRONYMS

ACOG: American Congress of Obstetricians and Gynecologists

ANC : Antenatal Care

AOR : Adjusted odds ratio

APHRC : African Population and Health Research Centre

BScN : Bachelor of Science in Nursing

CCC : Comprehensive Care Centre

CoK : Constitution of Kenya

FP : Family Planning

HBM : Health belief model

HIV : Human Immune-Deficiency Virus

HCP : Health care provider

KDHS : Kenya demographic health survey

KI : Key informant

LMICs : Low and Middle Income Countries

MMR : Maternal mortality rate

MCH/FP : Maternal child health and family planning

MO : Medical officer

NCD : Non communicable diseases

NHIF : National Hospital Insurance Fund

PCC : Pre-conception care

PH : Public health

PHC : Primary health care

PMTCT : Prevention of Mother-to-Child Transmission

PPH : Post Partum Haemorrhage

RH : Reproductive health

RHU : Reproductive health unit

SDG : Sustainable Development Goals

SMI : Safe Motherhood Initiative

SSA : Sub Saharan Africa

SPSS : Statistical Package for the Social Sciences

TL5H : Thika level five hospital

UHC : Universal health coverage

UN : United Nations

UNICEF : United Nations International Children's Emergency Fund

WHO : World Health Organization

WRA : Women of Reproductive Age

OPERATIONAL DEFINITION OF TERMS

Maternal mortality: Death of a mother due to complications of pregnancy or childbirth.

Maternal mortality ratio: The number of women who die from pregnancy-related causes while pregnant or within 42 days of pregnancy termination per 100,000 live births.

Pre-conception care: This is the provision of preventive, promotive, or curative health care and social interventions to a woman/couple before conception occurs.

Utilization: Use of preconception care services before or in between pregnancies.

Occupation: Source of income

Unintended pregnancies: Pregnancies that are unplanned or unwanted at the time of conception.

Women of reproductive age: Women aged between 18 to 49 years

ABSTRACT

Pregnancy, together with other unforeseen health risks could make situations worse during pregnancy, labour, birth, and thereafter. Naturally, women of reproductive age may not be aware of the impact that existing health conditions, health-related actions, and behaviours might have on them and the fetus during pregnancy. Preconception care is provided to women and couples before conception, thus addressing issues that could affect the outcome of pregnancy. Despite this care being available, most women seek care after conception, thereby missing pre-conception care service benefits. The aim of this study was to determine the level of Preconception care utilization and the associated factors among women of reproductive age attending Thika level five hospital. The study design was descriptive cross-sectional, and mixed methods of data collection were used. The dependent variable was utilization of Preconception care, and the independent variables were age, level of education, marital status, occupation, knowledge, social cultural factors, and institutional factors. Quantitative data was obtained through the use of interviewer-administered questionnaires, and qualitative data through the use of a key informant interview guide. The study population was 8950, and the sample size was 316. Systematic sampling was used to select the respondents, while purposive sampling was used for key informants. Quantitative data was analyzed using SPSS version 23 software to obtain descriptive statistics and presented in form of figures, charts, and tables. Qualitative data was categorized into themes, thematic analysis was done, and data was presented in form of narration. The findings of the study revealed that most women of reproductive age (62%; n=196) had utilized at least one form of Preconception care. The level of knowledge was low at 41% (n=129). Those who were knowledgeable were 2.69 times more likely to utilize preconception care (OR: 2.69; 95% CI: 1.647 to 4.407; p-value <0.001). Some social and cultural factors associated with utilization of Preconception care were partner support in decision making on maternal health issues and provision of transport. Those who were not supported with transport were 58% less likely to utilize Preconception care services (AOR: 0.421; 95% CI: 0.239 to 0.744; p-value 0.003). Institutional factors affecting utilization of Preconception care were knowledge deficit among health care providers, long queues (67.4%; n=213) in the hospital, and lack of awareness (50.3%; n=158) on existence of the services. Although utilization of Preconception care was good, the level of knowledge among women of reproductive age was low. Utilization was affected by socio-cultural and institutional factors. There is therefore need to train the health care providers on Preconception care to bridge the knowledge gap and awareness be created among women of reproductive age; human resource and infrastructure issues be addressed to create room for preconception care clinics in order to reduce long queues in the hospital and enhance utilization of preconception care.

CHAPTER 1: INTRODUCTION

1.1 Background of the study

Pregnancy is a risk, and other unforeseen health risks could make situations worse during pregnancy. Improved reproductive health (RH) leads to a healthier and productive society and access to greater financial and other resources. Effective utilization of preconception care (PCC) averts maternal and neonatal adverse outcomes and improves long term outcomes for women, adolescents, and children (Woldeyohannes et. al, 2023). This is because a healthy woman at conception is more likely to have a successful pregnancy and a healthy child (Stephenson et al, 2018).

Existing health conditions, maternal age, lifestyle, and other health issues present before or during pregnancy pose more risks in pregnancy (Shriver, 2018). Some of these risks emerge before pregnancy and hence the need for PCC utilization (Spry et al, 2020). Most of these risks are preventable through preconception care. Interventions carried out during adolescence are reported to effectively reduce untimely and unplanned pregnancies (Sainafat et al., 2020)

Preconception care is not a new concept, as it has been practiced for generations. In the bible, Manoah's wife, who had lived with infertility was cautioned by the Angel of the Lord before she conceived against taking wine, strong drinks or feeding on forbidden foods (Judges 13:2-4). Preconception care was also practiced in some communities where consanguineous marriages were discouraged because they contributed to increased risk of genetic disorders (Khayat et al, 2024). In some Kenyan communities, the elderly cautioned youths against intermarrying with families who had a history of certain medical conditions like mental illnesses, epilepsy, and chorea among others.

Globally, PCC has been utilized to enhance maternal and neonatal outcomes. In the United States, PCC is viewed as a means of addressing behavioral, social, and environmental factors that influence reproductive health and also help in preventing maternal and neonatal mortalities (Harper et al., 2023). It is a strategy to optimize maternal and neonatal health outcomes; however, it remains underutilized in Sub-Saharan Africa (Woldeyohannes et al., 2023). In Ethiopia, it was established that those with higher education levels and support from their partners were likely to utilize the PCC services (Fetena et al, 2023). In Kenya, utilization of preconception care was affected by unemployment and inability to pay for health care services (Owino et al., 2023). Socio-cultural factors have also been found to influence utilization of PCC. This was seen in some Kenyan communities where elders gave counsel to youths on families they were not to intermarry with. This was common where certain diseases were known to be prevalent in some families, like mental illnesses, epilepsy and chorea among others. In other communities, PCC is perceived as bad and unacceptable, and failed conception is a cultural belief influencing preconception (Owino et al., 2023).

Maternal deaths are reported to be the most challenging public health problem affecting the low and middle-income countries [LMIC] (Leal et.al 2022). The aim of PCC is to minimize factors that put women of reproductive age (WRA) at risk before conception through health promotion and interventions in order to reduce maternal and infant morbidity and mortality rates (Opayele et.al, 2022). The aim of the Safe Motherhood Initiative (SMI) and SDG 3 was to reduce the prevalence of global maternal mortality (Santora, 2020). However, MMR remains high with the global rate being 198 per 100,000 live births, which is nearly three times the SDG 3 target (UN interagency group, 2023). Reports indicate that two-thirds of the maternal deaths occur in SSA (UN, 2019). The Kenya Demographic Health Survey 2022 reports a MMR of 355, while the

UN Interagency Group (2023) reports a MMR of 149, which is still more than double the SDG target. Given the current progress, the SDG 3 target for reducing maternal mortality ratio to less than 70 per 100,000 live births is unlikely to be met.

The role of health care providers (HCP) is to assess and health educate women of reproductive age who desire to conceive. Some of the assessment procedures include personal, family, medical, and surgical history, personal environment, feeding habits, exposure to and use of harmful substances, or pregnancy complications. However, utilization of preconception care by women of reproductive age is low (Owino et al, 2023).

Certain factors have been identified at individual and institutional levels as negative influencers for PCC utilization such as poor pregnancy planning, insufficient knowledge, lack of PCC policy and guidelines (Ukoha & Mtshali, 2022). Unintended/ unplanned pregnancies can lead to unsafe abortion, but this can be reduced through early detection and management of adverse health issues and risks, resulting to reduced complications and deaths among WRA. There is therefore need to find out the level of PCC utilization and establish factors that are associated with its utilization.

1.2 Problem statement

Provision of preconception care is meant to bring a shift from acute care to provision of counseling based preventive care (Akinajo et al., 2019). Despite having PCC as a strategy for reducing maternal mortality rate, maternal deaths remain a challenging public health (PH) problem with serious health issues arising from pregnancy and childbirth (Leal et.al, 2022; WHO, 2023; UN, 2020 & World Bank, 2023). Maternal mortality rate remains high with reports indicating that a mother dies every two minutes from preventable pregnancy and child birth related causes (WHO,2023; UN, 2020 & World Bank, 2023). According to WHO, 260,000 women died from pregnancy and

childbirth related complications in 2023, and approximately 92% of these deaths occurred in low and middle income countries. Sub-Saharan Africa and southern Asia accounted for around 87% (225,000) of the estimated global maternal deaths (UN, 2019; UN, 2020 &World Bank, 2023; WHO, 2025). In Kenya, MMR is estimated at 355 per 100000 live births. Although ANC also targets to reduce MMR, its uptake is low & majority start late, hence missing the desired purpose (Ikamari,2020). Uptake of the four ANC visits in SSA is low at 52% while in Kenya it's 66% and only 4% had at least 8 visits. Only 29% of those who attended ANC had their 1st visit during the 1st trimester as recommended (UNICEF, 2022). Seeking for ANC services after the first trimester might be too late to offer interventions that can impact on pregnancy outcomes. To achieve the SDG 3 target, many countries will need to more than double their efforts in annual reduction of MMR to ensure sufficient progress, and hence the need for increased uptake of PCC services (Stanton et al, 2018).

In Kiambu county, uptake of PCC is low, with 44.5% of WRA reported to have unplanned pregnancies (Chepngetich et al, 2018). In this study, only 19.8% and 4.4% of WRA had been screened for hypertension and diabetes respectively, and only 18.8% used folic acid before conception. This data is an indication of low preconception care within the county. Non-communicable diseases (NCDs) have been linked to poor maternal health outcomes, which could be prevented through PCC (Jacob & Hanson, 2022). These non-communicable diseases (NCDs) are risk factors before pregnancy, during pregnancy, and even after delivery. A study conducted by Okyere et al. (2024) revealed that 15.9% women of reproductive age in Kenya had at least one NCD with hypertension being the most prevalent. In Kiambu County, prevalence of hypertension has been found to be high (31%) and is associated with modifiable behavioural factors

(Ndithia, 2024). This study therefore, seeks to establish the level of PCC utilization among WRA attending TL5H.

1.3 Justification of the study

The development blueprints of Vision 2030 and the Kenyan Constitution are to provide Kenyans with the highest attainable standards of health care (COK, 2010). Maternal deaths and near-misses are significant events in obstetrics and represent an important measure of quality of care, especially in low-income countries where there is a burden of high rate of maternal death (Adeniran et. al, 2019). Whereas severe maternal complications are mainly associated with obstetric causes, studies have shown that non-obstetric complications are associated with poorer pregnancy outcomes (Adeniran, 2019). There is therefore need to address both the preventable obstetric and non-obstetric risk factors before conception to minimize morbidity and mortality rates among WRA.

The scope of PCC comprises of preventive and primary care before a first pregnancy or in between pregnancies. Although PCC improves maternal and child health, its utilization is still low in developing countries (Demisse, Aliyu, Kitila, Gelaw, & Zerihun, 2019). Despite a lot of campaigns to reduce maternal morbidity and mortality rates, Kenya is far from attaining SDG 3 on reduction of MMR to less than 70 deaths per 100,000 live births (WHO, 2018). Maternal morbidity and mortality could be due to either direct or indirect causes.

Maternal deaths in SSA are high. MMR in Kenya is also high and far from achieving SDG 3. Kiambu County is reported to have the highest number of notified maternal deaths in the larger central province. Although ANC is recommended for maternal and infant health, pregnant women in low-income countries particularly SSA, often seek the services late and do not receive the recommended ANC services. In Kisumu

County, Provision of PCC was relatively low at 39% and provision was fragmented (Morema et al., 2022). In Ruiru Sub-County, Kiambu County, Family planning (FP) and prevention of mother-to-child transmission (PMTCT) services are some of the PCC services that are routinely provided at the maternal child health and family planning (MCH/FP) clinic and comprehensive care centers (CCC) respectively in Kenya; however, utilization of PCC is low (Chepngetich et al., 2018; Okemo et al., 2020). Provision of PCC services like care and referral of mothers with chronic illness like diabetes mellitus, heart diseases and hypertension; health education on PCC to the youths, adolescents, those intending to get married; before conception of the first baby and in between pregnancies is done to ensure that the mother is healthy before she conceives and hence safe to carry a pregnancy and have good pregnancy outcome. The researcher sought to establish the level of utilization of PCC and the associated factors among WRA. Increased utilization will contribute to healthy mothers and babies before, during and after pregnancy. Ultimately, this will contribute to reduction of maternal and child morbidity and mortality rates and ensure a healthier generation thereafter. The study was also meant to prompt health care providers see the need for routine provision of PCC and sensitize WRA on the existence of the services with the aim of increasing its uptake.

1.4 Research questions

1. What is the level of PCC utilization among women of reproductive age attending Thika Level Five Hospital?
2. What is the level of preconception care knowledge among women of reproductive age attending Thika Level Five Hospital?
3. What are the social cultural factors associated with utilization of preconception care among women of reproductive age attending Thika Level Five Hospital?

4. What are the institutional factors associated with utilization of preconception care among women of reproductive age attending Thika level five hospital?

1.5 Research objectives

1.5.1 Broad objectives

The objective of the study was to determine utilization of preconception care and the associated factors among women of reproductive age attending Thika level five hospital.

1.5.2 Specific objectives

1. To determine the level of preconception care utilization among women of reproductive age attending Thika level five hospital.
2. To assess the level of preconception care knowledge among women of reproductive age attending Thika level five hospital.
3. To establish the social cultural factors associated with utilization of preconception care among women of reproductive age attending Thika level five hospital.
4. To determine the institutional factors associated with utilization of preconception care among women of reproductive age attending Thika level five hospital.

1.6 Significance of the study

The government of Kenya guarantees all citizens in the constitution (2021), the right to quality healthcare, including reproductive health, while universal health coverage (UHC) focuses on preventing disease and promoting health through primary health care (PHC). Preconception care is one of the pillars of Safe mother hood Initiative, which is meant to contribute to the reduction of maternal mortality. Increased utilization of PCC contributes to healthier mothers and children, hence reducing maternal mortality and morbidity rates. The report on findings of this study will inform the Kiambu county government and TL5 hospital whether PCC services are adequately utilized by WRA

and the factors that are associated with its utilization. This information will guide in laying strategies that will ensure maximum utilization of the services by women of reproductive age.

Findings on the level of knowledge on PCC among WRA and the health care providers will inform the stakeholders of the relevant steps to take to ensure that identified gaps are addressed and there is adequate awareness of the availability and provision of preconception care services. This can be done through training of health care providers and health education to clients within the hospital set up, in public gatherings, in social and print media, or electronic media to reach a wide range of WRA.

Report on institutional factors associated with utilization of PCC will help TL5H and county management teams lobby for customized PCC policies and guidelines to increase awareness and its utilization. These documents will be used by health care providers to improve PCC care provision at both the national and county levels, as well as Thika level 5 hospital in Kiambu county, where the study was carried out. This will also inform Kiambu County and TL5H on county and facility level gaps that have been affecting utilization or provision of preconception care and address them.

Report on social cultural factors associated with the utilization of PCC will help the MOH, Kiambu county government, and Thika level 5 management encourage the positive aspects and demystify the negative factors through health education. It will also inform the healthcare providers of the possible interventions that can be used to increase the uptake of PCC.

The study findings will be shared with the Ministry of Health Management, the Kiambu County government, and the Thika level five hospital management teams in order to make informed decisions on PCC provision emanating from the research findings and

recommendations. These findings will widen the body of knowledge and form a theoretical basis for further research on PCC.

1.7 Limitations and delimitations of the study

There was a likelihood of information bias where the respondents may have provided information to impress the interviewer. This was delimited by a clear explanation of the research to the participants, including detailing the expected benefits of the research. Lack of cooperation from the participants who may have been in a hurry to leave the facility after receiving the services was delimited by interviewing the clients while they waited to be served. The other limitation was having clients who were not willing to take part in the study. This was delimited by seeking their consent and clearly explaining to the respondents that it was voluntary and that there were no penalties for not participating. In the event that one client declined, they were replaced by the next client. Responder bias was a limitation of the study because PCC is a sensitive topic, and responders may not have been willing to freely discuss it. This was delimited by clearly defining the scope of the study and pre-testing the research tool to ensure validity and reliability of the information.

1.8 Conceptual framework

Utilization of PCC includes use of folic acid; screening, control, and treatment of diseases; assessment for complications from previous pregnancies; nutritional and genetic counseling, screening for infertility, advice on cessation of substance/alcohol and cigarette use (Demisse, 2019).

Social cultural trends, institutional capability, and knowledge on PCC have a role to play in utilization of PCC as they dictate whether there will be good or poor utilization of the services. Positive social cultural practices and beliefs, coupled with adequate resources within the health facility and good knowledge of preconception care, will

lead to good utilization of PCC services. Knowledge on PCC includes components, sources of information, provision of services, and eligibility for the services

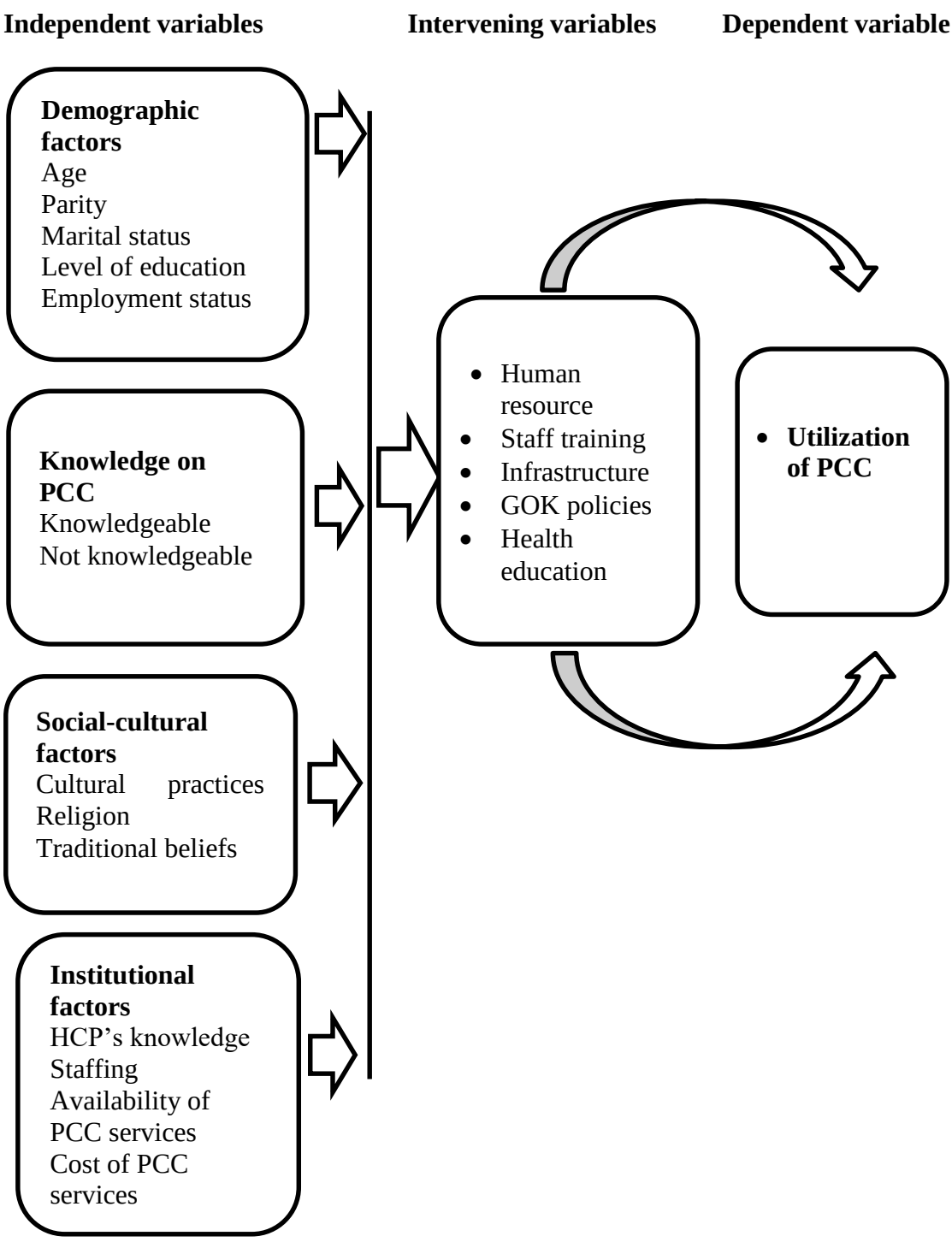

Figure 1.1: Conceptual Framework (Adapted from Swaen & George, 2022)

1.9 Theoretical Framework

The study adopted the health belief model (HBM), which was developed to explain and predict health-related behaviours regarding uptake of health services (Hochbaum, 1958).

The health belief model focuses on two aspects of individuals' representations of health and health behavior, which are threat perception and behavioural evaluation. Threat perception is based on two beliefs which are perceived susceptibility to illness or health problems, and anticipated severity of the illness (Abraham and Sheeran,2016; Hochbaum, 1958). This is driven by a person's ability to weigh the risk of contracting a disease and Perception of the seriousness of the disease. Through this, the individual weighs the severity of the health problem and its impact on lifestyle.

The model also focuses on behavioural evaluation, which focuses on the benefits of a recommended health behaviour, and the barriers to enacting the behaviour. Cues to action are expected to activate a health behaviour when appropriate beliefs are held (Abraham and Sheeran, 2016). The likelihood that a person will follow a preventive behavior is influenced by their subjective weighing of the costs and benefits of the action.

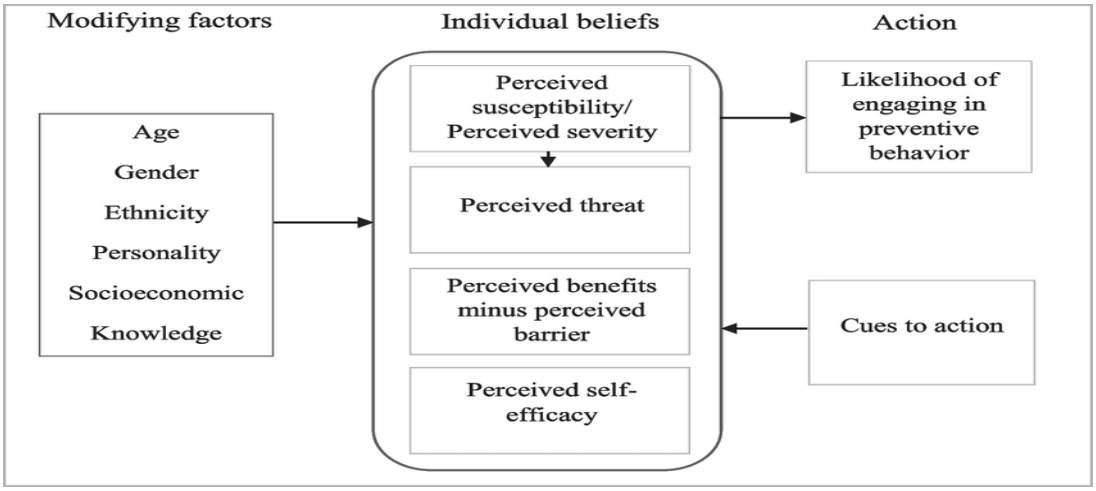

Figure 1.*2*: Health belief model (Adapted from Rosenstock, 1974)

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Preconception care is one of the eight pillars of Safe Motherhood Initiative (SMI), which was declared in 1978 by WHO to improve maternal health (Santora, 2020). “Maternal and paternal preconception exposures, including obesity, substance use, and education, all predict patterns of offspring development” (Patton, et al, 2018). This explains the need for preconception care.

Some of the causes of maternal deaths are postpartum haemorrhage (PPH), ruptured uterus, sepsis, and hypertensive disorders, with hypertensive disorders accounting for 27.8% of all maternal deaths (Geleto, et al.,2020). Studies also show that obesity poses a high risk for maternal death as it can lead to cardiovascular diseases, thromboembolisms, and hypertension complications. Most of these deaths are preventable with good and consistent provision of PCC. Improving a woman’s health before conception can lead to improved reproductive health outcomes and also a reduction in societal costs (Stephenson et al., 2018). The cost of health care in Kenya is relatively high and a burden to many citizens, and investing in prevention of ill health among WRA will benefit not only the clients but also the nation as a whole.

2.2 Preconception care utilization

Preconception care is not a new concept as it has been practiced for generations. Preconception care services are essential to a woman before conception. Studies show that utilization and provision of PCC is low in SSA, with some components such as folic acid supplementation and family planning being underutilized (Ukoha et al., 2022). Their reports further state that a gap exists between health care providers' knowledge and PCC practice since some HCP are highly knowledgeable about PCC but practice PCC infrequently.

Several studies carried out in Ethiopia revealed that uptake of preconception care was relatively low, with folic acid supplementation and healthy nutrition as the leading components of PCC that respondents had utilized (Asresu et al., 2019 & Demisse et al., 2019; Amaje et al., 2022). A study conducted in Kenya at Maragua level 4 and Agakhan University hospitals found that utilization of PCC services was 25.8% with 16.5% having received the services from a public facility as compared to 35.1% in private facility (Okemo et al, 2021). According to Okemo et al, the percentage of women who visited health care professionals to discuss pregnancy plans and preparation was the least (23.7%) compared to those who received PCC services because they were sick and needed medical care (36.1%) and those who visited for regular health checkups (25.8%).

A study conducted at Moi teaching and referral hospital revealed that majority of WRA did not seek for preconception services because they were not aware of the services (Wanyonyi & Abwalaba,2019). Failure to address preconception health care services by most obstetricians, nurses, and midwives when providing routine care was reported to be a source of knowledge gap in this study. The study also established that most health care providers did not address preconception health. Some of the barriers to poor utilization of preconception are lack of finances, lack of social support, fear of negative reports like HIV (+) status, cost implications in terms of transport, required tests, and medications; inadequate knowledge and lack of recognition of the benefits of PCC (Siraha et al., 2020).

2.2.1 Role of preconception care

Giving care to a couple before conception is essential in optimizing the health and development of future generations (Asresu et al, 2019). Utilization of PCC services by WRA has the potential to avert many adverse outcomes of pregnancy (Asresu et al, 2019). Increased access to care before conception and in between pregnancies, quality preconception and inter-conception care contribute positively to maternal and infants health and reduce pregnancy related complications (Demisse et al, 2019).

Risks of adverse health for the mother, the foetus, and neonates are reduced once a woman's health and knowledge are optimized before conception (Kassa & Yohannes, 2018). Adoption of regular preconception care can also assist in shifting from provision of emergency care for acute conditions and complications to the provision of preventive and counseling-based preventive care (Opeyemi et al., 2019)

2.2.2 Unintended pregnancies

One of the indicators for non-utilization of preconception care is prevalence of unintended or unwanted pregnancies. Unplanned pregnancies are prevalent both in developing and in developed countries like the United States of America (Sutton et al.,2018). Globally, one in four pregnancies is unintended, which is caused by fear of contraceptive side effects, concerns about one's health, and failure to see the likelihood of conceiving by WRA (WHO,2019). An estimated 44% of pregnancies worldwide are unintended, while in the developing world 65% are not planned (Bearak et al.,2018). In SSA, it is estimated that 29% of pregnancies are unintended (Ameyaw et al,2019). In Swaziland, the rate of unplanned pregnancies is 70% (Hultstrand et al., 2019). Hultstrand et. al (2019) also reported that teenagers and first time mothers were not likely to use contraception, which increases their likelihood of having unplanned

pregnancies. The KDHS report in 2020 indicated that 41.9% of all pregnancies in Kenya were not planned.

Unintended pregnancy contributes to adverse maternal and child health outcomes (Obiero & Mwai,2018). Motlagh et al (2020) state that there is a "significant association between unwanted pregnancy and pregnancy care, anemia, exposure to risk factors and disease, intake of folic acid and iron, domestic violence, bitter memories and men's participation". it's reported that a great number of the unintended pregnancies in the low and middle-income countries end up in life-threatening induced abortions (Ameyaw et. al, 2019). According to KDHS 2014 reports unsafe abortion rate in Kenya was 35%. This contributes to high maternal mortality and morbidity rates (Jayaweera et al, 2018; Obiero & Mwai, 2018). The average cost of managing a case of unsafe abortion in a public institution is almost 5000 Kenya shillings and 7.4 hours of health care providers' time (APHRC, MOH & IPAS, 2018). This cost can be avoided with increased utilization of PCC, which is useful in minimizing the number of unsafe abortions that are associated with unintended pregnancies and by extension maternal deaths (Hultstrand et. al, 2019).

A lot of emphasis has been put on antenatal services as a means for reducing maternal mortality ratio, but targets have not been met. Hultstrand et. al (2019) reported in their study that teenagers were less likely to comply with the recommended ANC visits. Seeking for ANC services after the first trimester might be too late to offer interventions that can impact on pregnancy outcomes. Research also reveals that pregnant women in low-income countries, particularly Sub-Saharan Africa, often do not receive the recommended ANC services (Warri & George, 2020). This is a clear indication of the need for PCC in Kenya to curb the possible undesired outcomes of pregnancy and childbirth. To achieve the SDG 3 target, many countries will need to more than double

their efforts in annual reduction of MMR to ensure sufficient progress, and hence the need for increased uptake of PCC services (Stanton et al, 2018).

2.3 Knowledge on preconception care among women of reproductive age

Knowledge is an important aspect of health promotion. The bible states in Hosea 4:6a that people perish for lack of knowledge. Studies conducted in Europe and Africa revealed that WRA had low knowledge on preconception care, whereas in developed countries like the United States, Canada, and China, knowledge levels were higher (Li et al, 2019 & Ekbal, 2019). In another study conducted in Southeastern Mexico among WRA, preconception care knowledge level was found to be low, with only 36.23% having heard about PCC. About 30.43% of these women learnt about PCC from health personnel (Hernández et al, 2024). In this study, Hernández et al (2024) and Li (2019) associated preconception knowledge and practice to education and socioeconomic status. In Shaanxi, China, age was identified as a key factor that influenced the attitude and practice level. Age also demonstrated an effect on awareness to right timing of folic acid utilization, increased premarital and preconception examination (Li,2019). Ayele et al (2021) also stated that the pooled prevalence of knowledge among WRA in Ethiopia was 30.9% with secondary education and above being significantly associated with knowledge. They further stated that integrating strategies and policies that are capable of addressing PCC components with maternal and child services would be essential in effective implementation strategies geared towards enhancing its uptake.

Lack of awareness on the importance and availability of PCC services and cost of the services has been found to affect utilization of the services (Dlamini et al.,2019; Wanyonyi & Abalabwa, 2019). Studies carried out in SSA show that knowledge, utilization, and provision of PCC among HCPs and WRA were suboptimal (Ukoha et al., 2022). In Western Ethiopia, a study revealed that only 21.3% of women of

reproductive age had good knowledge on PCC, mainly on screening for HIV and discontinuing FP (Teshome et al., 2020). Family planning, avoidance of substances, vaccination, screening, and treatment of diseases are some of the components for PCC cited by some of the women of reproductive age (Fekene et al.,2020).

In Kenya, there is a significant knowledge gap on the extent to which non-communicable diseases and the associated factors affect women of reproductive age, who are prone to experience behavioural and metabolic risk factors simultaneously, leading to an increased risk of the diseases (Okyere et al., 2024).

Studies conducted in Ruiru subcounty in Kiambu county revealed that 61.7% of the respondents lacked adequate knowledge on PCC services, and the few who had the knowledge got it from HCP in the hospital (Chepngetich et al,2018). Okemo et al (2020) reported in their study that many women felt that information about PCC was not enough.

Preconception care services should be provided to all women of reproductive age, and creating awareness among the youths and adolescents would help increase utilization of the services in due time. Patton et al (2018) state that, "investing in today's adolescents, including the timing of parenthood, will yield great dividends for future generations because adolescence is a sensitive phase by which the physical, nutritional, and social environment quality may change the course of health and development into later life".

2.4. Socio-cultural factors associated with utilization of PCC

World Health Organization, as cited by Maury, Marin & Maury (2022), states that healthy lifestyle habits ranging from preconception to postpartum are essential for successful pregnancies. Preconception care has been recognized for its role in reducing pregnancy-related deaths and ill health (Sijpkens et. al,2019. One of the gaps that has

been identified in maternal health continuum of care is reduced attention to adolescents and young women until when they conceive (Wegene et al,2022). Even where utilized, PCC is often initiated after sexual debut, missing a critical moment when crucial information on PCC should be delivered to prevent risky sexual behaviors and reproductive health complications" (Peterson-Burch et al, 2018).

Adolescents are an important cohort in reproductive health due to various challenges they face to suit their lifestyles, feeding habits, and other health issues like drugs and substance abuse and hence the need for starting PCC early (Bickmore et al, 2019). Some young and healthy women don't foresee any pregnancy-related risks, and this poses a challenge to utilization of PCC services; others perceived that the services are intended for infertile and sickly women, while others perceived that health and lifestyle issues should be addressed only after conception (Rahman et al., 2017). A study carried out among the Latinas in the United States found that parents were uncomfortable with HCP having private conversations with their daughters. Majority felt that giving information on preconception or reproductive health was unnecessary since their daughters were not sexually active (Peterson-Burch,2018). Similarly, in our African setting, discussion on sexuality even among the adults is like a taboo; hence, stigma and conflicting levels of acculturation between adolescents and parents act as barriers.

Some of the social cultural issues affecting PCC include low provision of the services to men and WRA despite them being key players in utilization of reproductive health services (Goossens et.al, 2018). Sijpkens et al (2019) stated that 82.3% WRA who had previous pregnancies in the Netherlands had at least one lifestyle risk factor before they conceived to include smoking, alcohol or illicit drug use, and poor nutritional practices. Women's age, parity, education, employment, and marital status were reported to have a role in utilization of PCC (Arsesu et al, 2019). According to Demisse et al (2019), the

higher the age of WRA, the higher the chances of utilizing PCC. He also stated that the likelihood of WRA aged 34 to 39 using PCC services was 3.6 times higher than those aged 15-24 years.

In SSA reports indicate that married women are six (6) times more likely to have unintended pregnancies, which is an indication of non-utilization of PCC, than single women (Ameyaw et al, 2019). Partner support, literacy on health, previous experience in negative delivery outcomes, and living with chronic diseases were reported to positively contribute to improved utilization of PCC in Ethiopia, while inability to access health facilities contributed to low utilization of preconception care (Asresu et al, 2019). In western Ethiopia, high level of education contributed positively to higher utilization of PCC than those who had a lower level of education, while women with high parity utilized PCC services more than first-time pregnant women (Goshu et al.,2018). A study conducted by Owino et al. (2021) in Machakos found that receiving assistance from another individual was significantly associated with utilization of PCC. In Kenya, women of reproductive age 30 years and above, married women, women with tertiary education, and those who had not had any pregnancy before were more compliant to PCC (Okemo et al, 2020).

Some of the social cultural barriers cited by Rahman et al. (2017) include family commitments due to other competing priorities; language, academic qualifications, religious beliefs, and the perception that PCC is not meant for all age groups. Other barriers included refusal by spouses who find it a waste of time and money, some women being shy in sharing about their intentions to get pregnant, and lack of male involvement, despite the prevalence of high-risk behaviors among men like cigarette smoking and domestic violence, which pose risks to both the women of reproductive age and the unborn child.

2.5 Institutional factors associated with utilization of PCC

The role of Preconception care is to minimize risks of complications from pregnancy and childbirth and produce favourable perinatal outcomes, but its provision is currently inadequate (Nwolise et al.,2020). One of the strategies for reducing maternal, perinatal, and neonatal morbidity and mortality was to expand access to preconception care, including screening, counseling, and management of pre-existing conditions (The national reproductive health policy 2022:2032, 2022). Ayele et al (2021) stated that integration of PCC strategies and policies responsible for addressing all the PCC services components with other RH services could be essential in designing effective implementation strategies for improving preconception care uptake. Besides this, advocating for better education for women, awareness creation, and increasing antenatal care services are essential.

Health professionals have a key role in the provision and utilization of PCC. Knowledge of health care providers on PCC has a significant effect on its provision (Sori et al, 2021). A cross-sectional study conducted at West Shoa in Ethiopia revealed that only 48.2% of the obstetric care providers had good knowledge of preconception care. Another study conducted in Ethiopia reported that knowledge and practice of preconception care were poor among the majority of the health care providers (Abayneh et al., 2022). In their study, Sori et al (2021) found that having training on preconception care and reading preconception care guidelines were significantly associated with good knowledge on preconception care. From the outcome of this study, they recommended regular preconception care training, continuous medical education, provision of comprehensive guidelines, and reading of preconception care guidelines by health care providers to enhance its uptake.

Utilization of preconception care in rural areas is low compared to the urban and this is associated with unavailability of obstetricians and gynecologists (American Congress of Obstetricians and Gynecologists [ACOG],2019). Dorney & Black (2018) state that referrals from general practitioners for comprehensive hospital-based PCC services are minimal. This is despite the fact that the general practitioners have the potential and have a key role in expanding women and men of reproductive age access to preconception assessment and counselling.

Some of the recorded barriers to utilization and provision of PCC include, lack of a comprehensive PCC program; inadequate knowledge on the benefits of PCC; uncertainty of the general practitioners on the necessity and effectiveness of preconception care; non-coordination and organization of PCC; differing views on pregnancy and the responsibility of health professionals (M'hamdi et al,2017. Stigmatization towards teenage mothers; feelings that most HCP are judgmental and unskilled in dealing with adolescents; lack of resources including HCP; non-incorporation of the services and commitment to other health programs; delays at the clinic, inappropriate consultation areas, lack of privacy, poor client flow and promotional activities, lack of knowledge on the services among the staff and distance from the health facility were cited as some of the barriers to utilization of PCC (Rahman, et al., 2017). Lack of knowledge on male involvement has also been cited as one of the main barriers that hinders midwives and other health providers from providing adequate preconception care (Goossens et al, 2019).

2.6 Summary and gaps identified

Studies on PCC utilization in Kenya are still few compared to some countries like Ethiopia. Most of these studies are carried out in the community, hence do not involve the HCP who are the implementers of PCC services. Literature is also silent on the

availability of service provision areas. Researches conducted in the health facilities are mostly conducted from antenatal clinics, hence lacks diversity in the information gathered. This study aimed to establish whether the health care providers had the relevant knowledge on PCC, which could be very instrumental in enhancing the uptake of the services, but was mostly not considered in other studies. This was because most of the data on PCC is collected from women of reproductive age. The study was also conducted to establish the PCC practices by health care providers, which is not clear from other researches.

Most causes of maternal deaths are preventable, and PCC has a key role as it optimizes the health and development of future generations**.** Increased access and quality preconception and inter-conception care minimizes risk of complications from pregnancy and childbirth and contributes to positive maternal and infants' health. However, its provision is currently inadequate.

Utilization of PCC is low in developing countries Kenya included and it's even lower in rural areas due to unavailability of obstetricians and gynecologists. Key PCC services, like the use of folic acid and family planning are underutilized. A key indicator of non-utilization of PCC is the prevalence of unintended pregnancies, which is high in both developed and developing countries. Unwanted pregnancies are associated with poor pregnancy care, exposure to risk factors and disease, domestic violence, bitter memories and poor men's participation. Most of them end up in life-threatening induced abortions. Cases of unsafe abortions are rampant in Kenya, which contributes to increased morbidity and mortality rates. Managing a case of unsafe abortion is expensive and costs a lot of health providers' time.

Knowledge on PCC is low in developing countries, including Kenya. Lack of awareness on pre-pregnancy services and Knowledge, utilization, and provision of PCC

among HCPs and WRA are suboptimal even in countries where PCC has existed for many years**.** The low knowledge level and lack of awareness of the existence and availability of the services are the main contributing factors to the low level of PCC utilization. One source of knowledge gap is failure by obstetricians, nurses, and midwives to address PCC when providing routine care to clients.

Cultural beliefs on sexual issues affect the utilization of PCC. Stigma and conflicting levels of acculturation between adolescents and parents act as barriers in African tradition, where discussion on sexuality, even among adults, is a taboo. Hence, PCC is often not initiated before sexual debut, which is a critical time to deliver information to prevent risky sexual behaviors and reproductive health complications.

Institutional factors associated with provision of PCC includes, minimal referrals from general practitioners, lack of comprehensive PCC programs; non coordination and organization of PCC; differing views on the responsibility of health professionals on PCC; lack of resources including HCP; non-incorporation of the services to other health programs; delays at the clinic, inappropriate consultation areas, lack of privacy, poor client flow and promotional activities, distance from the health facility and lack of knowledge on male involvement which hinders midwives and other health providers from providing adequate PCC.

CHAPTER 3: MATERIALS AND METHODS

3.1 Introduction

This chapter presents the research design and methodology of the study. It includes the sampling technique and sample size determination method, study population, research instruments, data collection, data analysis, and ethical considerations.

3.2 Research design

A descriptive cross sectional study design, which employed mixed methods and a convergent parallel design was used during data collection to conduct the study at Thika level five hospital in Thika West sublocation, Thika subcounty, Kiambu county. The study design was used because findings from cross sectional studies are representative and can be generalized.

3.3 Variables

3.3.1 Dependent variable

The dependent variable was utilization of preconception care services. It was classified as utilized or not utilized. Any participant who had received at least one type of PCC intervention was deemed to have utilized preconception care. The PCC interventions were: family planning, folic acid, vaccination, genetic counselling or testing, nutritional counseling, treatment of existing diseases, change of drugs or dosage of daily medication, screening for infertility, assessment of previous pregnancy complications, or advice on cessation of alcohol, cigarette and other addictive drugs.

3.3.2 Independent variables

The independent variables were knowledge of preconception care, socio-demographic, social-cultural, and institutional factors. Knowledge was classified as either knowledgeable or not knowledgeable. In demographic factors, age was grouped in cohorts of 5 years; education level: none, primary, secondary & tertiary; occupation:

self and partner, residence, marital status, and religion of the woman; cost of preconception care services (cash, NHIF, or other private insurance), family and obstetric health. These variables influence utilization of preconception care, which was the dependent variable.

3.4 Location of the Study

The study was conducted at Thika level five (TL5H) hospital in Kiambu county, Thika sub county, south west of Nairobi. The hospital is located 45Km from Nairobi city and 1Km from Thika town, in the highly industrialized and largest town in Kiambu county. Due to these factors, it attracts many people from different counties who are either employed or in search of employment in those industries.

Thika level 5 Hospital is the only referral facility in Kiambu County. As a referral hospital, it serves a large number of clients from within the county and also from the neighbouring counties like Murang'a, Machakos, and Nairobi, among others giving it a wide range of clientele.

In 2017, Thika Level Five Hospital was designated as a reproductive center of excellence in Kiambu County. Despite this, the county has previously been reported to have the highest maternal mortality rate in the larger central region of Kenya, its low total fertility rate (2.9) notwithstanding.

The hospital has the highest bed capacity in the county, with 467 beds and an occupancy rate of more than 100%. On average, the hospital attends to an average of 105,000 women of reproductive age (15-49 years) annually, and around 8,950 women per month. The health facility has 3 obstetrics & gynaecology consultants,32 medical officers (M.O), 25 medical officer interns,1 reproductive health clinical officer,27 general clinical officers, and 244 nurses (TL5H Records department).

3.5 Study population

The target population was women of reproductive age, 18-49 years old, attending Thika level five hospital at the maternal child health and family planning clinic, and health care providers working in the reproductive health unit and the medical clinic. The study population was 8950, which is the average number of women of reproductive age attending Thika level 5 hospital per month.

The study population for the qualitative data were Doctors, Nurses, Midwives, and Clinical Officers who worked in the reproductive health unit.

3.5.1 Inclusion criteria

Quantitative data: The inclusion criteria was consenting women of reproductive age 18:49 years who were pregnant and up to six (6) months after the last delivery seeking services at the MCH/FP clinic in Thika level 5 hospital.

Qualitative data: The inclusion criteria was Doctors, Nurses, Midwives, and Clinical Officers who had worked in the reproductive health unit for at least six months.

3.5.2 Exclusion criteria

Quantitative data: The exclusion criteria was sick mothers and mothers with sick children.

Qualitative data: Those who did not consent to the study.

3.6 Sampling technique and Sample Size

3.6.1 Sampling technique

The sampling method for quantitative data was systematic sampling. The researcher utilized the attendance register as the sampling frame. The k^{th} number was arrived at by dividing the average monthly population of women of reproductive age seen per month by the sample size (K^{th}=8950/285=31). The first respondent was picked

randomly among the first thirty one clients. The researcher then picked every 31st client until the desired sample size was achieved.

The sampling method for qualitative data was purposive, where the respondents were purposively selected to participate in the study. Key informants comprised of 10 nurses, 3 clinical officers, and 3 doctors.

3.6.2 Sample size determination

To determine the sample size, the researcher adopted Fisher's et al formula.

$$n = \frac{z^2pq}{d^2}$$

$$\mathbf{n = \frac{1.96^2X0.258X0.742}{0.05^2}}$$

Where:

n was the sample size

z was the confidence interval at 95%: 1.96

p was the estimated population (estimated PCC uptake is 25.8% based on a study carried out in Muranga and Nairobi Counties)

q = 1-p

d was the margin of error at 5%

n= 294

since the population was less than 10000, calculation for the finite population was done using;

$$nf = \frac{N}{1 + (N/n)}$$

$$nf = \frac{294}{1 + \left(\frac{294}{8950}\right)} =$$

nf =285

An addition of 10% for non-response or incomplete responses was added, which was 10% x 285 =28.5, hence 29 participants. This gave a sample size of **314** (285+29) participants.

3.7 Pre-testing

Pre-testing of study instruments was conducted at Mbagathi level 4 hospital. The Hospital is in Nairobi County and was selected because it has a similar setting to that of Thika level 5, where reproductive health services are integrated and offered under one roof. Since the hospital is in a different county, chances of having clients who participated in the pretest participating in the study at Thika level 5 hospital were minimal. Thirty-one (10% of the sample size) questionnaires were administered to women of reproductive age at the MCH/FP clinic.

3.7.1 Validity

Validity was ensured through training of research assistants and by ensuring that selection of the study participants was done as per the set criteria to avoid selection bias. This was also done to ensure that the sample population was a true representative of the target population. Content validity was ensured through clear definition of concepts and pre-testing of the study tool.

3.7.2 Reliability

Reliability was ensured through pre-testing of research tools. This was done at Mbagathi level 4 hospital, where 31 (10% of the sample size) questionnaires were administered to women of reproductive age at the MCH/FP clinic to test for any

ambiguity, clarity, and whether the questionnaire was easily understandable. Any question found to be ambiguous or unclear was either expunged or rephrased to ensure a common understanding. Test-retest reliability was ensured through a pre-test, and ensuring the research assistants clearly understood the scope of the study. Cronbach's alpha test was done to determine the correlation of the research tool items. This resulted to 0.7, which indicates that the tool is acceptable on internal consistency.

3.8 Data Collection Techniques

Quantitative data was collected from women of reproductive age attending Thika level five hospital's MCH/FP clinic using an interviewer-administered semi-structured questionnaire to collect data from women of reproductive age. Three Bachelor of Nursing (BScN) graduates were trained as research assistants since they had learnt about research. The information collected using the questionnaire included utilization of PCC, socio-demographic, socio-cultural and institutional factors associated with PCC and knowledge on PCC.

Qualitative data was collected from health care providers using a key informant interview (KII) guide. These comprised of 10 nurses, 3 clinical officers and 3 doctors. The guide was used to collect data on utilization, knowledge and factors associated with utilization of PCC.

Informed consent was sought from the participant before the interview. After consenting, the semi-structured questionnaire was administered by research assistants to those who met the criteria. If a woman received at least one type of intervention, (either advice or treatment, lifestyle modification care, screening and treatment for any disease, use of folic acid, vaccination, counseling, diet modification, cessation of alcohol, cigarette smoking, taking of illicit drugs, pregnancy planning, healthy

environment) at least once before being pregnant she was considered to have utilized PCC (Demisse et al., 2019).

The key informants' interview was conducted by the researcher after obtaining consent from the respondents. Responses were recorded in form of notes as well as voice recording to ensure maximum acquisition of data.

3.9 Logistical and Ethical Considerations

The research proposal was approved by Kenyatta University graduate school (Appendix iv). Ethical approval was obtained from Kenyatta University Ethical Review Committee (Kenyatta University Ethics Committee approval number, PKU/2383/11520 -Appendix v). Permission to conduct the study was obtained from the National Council for Science, Technology and Innovations (NACOSTI: License No: NACOSTI/P/22/16327; Appendix vi), Kiambu County, Department of Health Sciences, Health Research and development unit clearance *(*Appendix vii), and from Thika level five hospital management team (Appendix viii).

Study participants were informed that taking part in the study was voluntary, and informed consent was sought prior to administration of the questionnaire. The participants were not required to write their names on the questionnaire to ensure anonymity and confidentiality.

Soft copies were saved using a password; hence, only the researcher had access to the information. Since the information gathered was intended to enhance the reproductive health outcomes of the community, the findings will be shared with the participants in community gatherings, during health education, in conferences, and the report will be published in refereed journals.

3.10 Data analysis

Quantitative data analysis was done using SPSS version 23 software. Descriptive statistics were reported. Inferential statistics was done and p-values reported. The level of significance was <0.05. Data was presented using figures, tables, and narrative texts. Logistic regression was used to determine the impact of independent variables on utilization of preconception care. Bivariate analysis was done to check the relationship between the independent and dependent variables. Multivariate analysis was conducted using binary logistic regression to generate adjusted odds ratios.

Qualitative data was transcribed and manual coding was done. The codes were categorized into themes, and thematic analysis was done. A phenomenological approach was used to ascertain the participants' perspectives on PCC.

CHAPTER 4: RESULTS

4.1 Introduction

This chapter describes the results of the study. Both quantitative and qualitative results are presented.

4.2 Response rate

4.2.1 Women of Reproductive age

The number of respondents recruited into the study was three hundred and sixteen (316) against a sample size of three hundred and fourteen (314) respondents. The response rate was 100.6% which was excellent.

4.2.2 Health care providers

The study also involved interviewing 16 health care providers who were key informants. This included 10 nurses, 3 clinical officers and 3 doctors.

4.3 Demographic information

4.3.1 Socio-Demographic Data of the Participants

The mean age of the respondents was 26.29 years (95% CI: 25.70 to 26.89). More than a third (34.2%; n=108) of the respondents were aged between 23 and 27 years. Majority (92.4%) of the respondents were residents of Kiambu County. Three-quarters of the respondents (75%; n=237) were married. Christians formed 98.7% of the respondents (Protestants: 75% (n=221); Catholics: 28.8% (n=91)). Only 1.3% (n=4) were Muslims. Literacy levels were above average, with those who attained tertiary education (college/ university) being 45.9% of the population (n=145). Table 4.1 displays the social demographic information.

Table 4.1: Socio-Demographic Data of the Study Participants.

Variable	Category	Frequency	Percent
Age group	18 - 22 Years	89	28.2
	23 - 27 Years	108	34.2
	28 - 32 Years	77	24.4
	33 - 37 Years	28	8.9
	38 - 42 Years	13	4.1
	43- 47 Years	1	0.3
Area of Residence	Kiganjo	63	19.9
	Makongeni	48	15.2
	Thika	70	22.2
	Juja	29	9.2
	Kenyatta Road	3	0.9
	Witeithie/ Mangu	39	12.3
	Ngoingwa	10	3.2
	Kenol	7	2.2
	Kabati	6	1.9
	Kisii Estate	10	3.2
	Murang'a	10	3.2
	Emali	1	0.3
	Ruiru	7	2.2
	Githurai 44/45	10	3.2
	Gatundu North/ Mang'u	1	0.3
	Ruaka	1	0.3
	Kinoo	1	0.3
Marital status	Single	70	22.2
	Married	237	75
	Separated	9	2.8
Religion	Catholic	91	28.8
	Protestant	221	69.9
	Muslim	4	1.3
Level of Education	None	1	0.3
	Primary	34	10.8
	Secondary	136	43
	College/ university	145	45.9

4.3.2 Socio-economic Characteristics of the Participants

Approximately a third of the respondents (31.1%; n=98) were housewives. Those who were self-employed were 29.8% (n=94), while 15% (n=46) were formally employed. A good number of the respondents (11.1%; n=35) were students. Among the partners, 2.2% (n=7) were students. More than half of the respondents (53.2%; n=168) paid the hospital bill in cash, 46.5% (n=147) cleared using the National Hospital Insurance Fund (NHIF), and only (0.3%; n=1) had a private insurance cover. Table 4.2 displays the socio-economic characteristics.

Table 4.2: Socio-Economic Characteristics of the study participants.

Variable	Category	Frequency	Percent
Respondent's Occupation	Student	35	11.1
	House wife	98	31.1
	Formally Employed	46	14.6
	Casual Laborer	9	2.9
	Self Employed	94	29.8
	Unemployed	33	10.5
Partner occupation	Student	7	3
	Unemployed	97	37
	Formally Employed	50	19
	Casual Laborer	98	37
	Self Employed	11	4
Hospital bill payment	Cash	168	53.2
	Private insurance cover	1	0.3
	NHIF	147	46.5

4.3.3 Family Health of the Participants

Majority of the respondents (94%; n=296) had no history of chronic illness. Almost all the spouses (99.7%; n=315) did not have a history of a chronic disease. The family history of chronic disease was only present in 26.3% (n=83) of the study population. Table 4.3 displays the results.

Table 4.3: Family Health History of the Respondents

Medical History	Response	Frequency	Valid Percent
Respondent's chronic disease history	No	296	94
	Yes	19	6
Spouse's chronic disease history	No	315	99.7
	Yes	1	0.3
Family chronic disease history	No	233	73.7
	Yes	83	26.3

4.3.4 Obstetric Information of the Participants

Almost 90% of the respondents had one to three pregnancies. The mean number of pregnancies was two. Majority of the respondents (70.6%; n=223) planned for the pregnancies. Slightly below a third (29.1%; n=92) of the respondents had no plans of having another baby, and there were several reasons given for not planning to have another baby. Table 4.4 illustrates the results

Table 4.4: Obstetric Data of the Study Participants

Obstetric Data	Responses	Frequency	Valid Percent
No. of pregnancies	1	147	46.5
	2	87	27.5
	3	50	15.8
	4	21	6.6
	5	8	2.5
	6	1	0.3
	7	2	0.6
Plan to get another baby	No	92	29.1
	Yes	224	70.9
Reason for not planning to get another baby	Intended family size	70	76.1
	Difficulties with the Current pregnancy	3	3.3
	Health challenges with previous pregnancies	3	3.3
	Medical health-related issues	1	1.1
	Economic hardship	4	4.3
	Unstable family	1	1.1
	Other reasons	10	10.9

4.3.5 Use of addictive substances by study Participants and their spouses

Approximately 2% of the respondents were cigarette smokers, 25.6% took alcohol, and 0.9% used other drugs of addiction. Only 4.8% of the spouses smoked cigarettes, 18.1% drank alcohol, and 0.6% used other drugs of addiction. Table 4.5 shows the results

Table 4.5: Use of Addictive Substances by Women of Reproductive Age and their spouses

Use of addictive substances	Responses	Frequency	Valid Percent
Client smoking cigarettes	No	309	98.1
	Yes	6	1.9
Client's use of alcohol	No	235	74.4
	Yes	81	25.6
Client's use of other drugs of addiction	No	313	99.1
	Yes	3	0.9
Spouse alcohol	No	258	81.9
	Yes	57	18.1
spouse's use of cigarettes	No	300	95.2
	Yes	15	4.8
spouse's use of other drugs of addiction	No	313	99.4
	Yes	2	0.6

4.4 The Level of Preconception Care Utilization by Women of Reproductive Age Attending Thika Level 5 Hospital

Majority of the respondents received at least one type of intervention, either advice, treatment, and/or lifestyle modification care, before conception. Thus, the level of preconception care utilization was 62%. Utilization of PCC was also confirmed by some key informants. One KI reported, "*Clients walk to the RH clinical officer to enquire about PCC, they are done physical examination, check HB levels, nutritional advice, and are prescribed supplements. Those who have complications like IUFD are advised on how to prepare for the next pregnancy (Nurse, Key informant 8).*

Another KI said, *"There are those who will inform the HCP of their intention to conceive and are advised to wait until they get a report about their viral load. We do*

screening and give supplements, encourage use of condoms, and we inform the clients about how long they should use condoms before conception. Health education revolves around the menstrual cycle, specifically about the fertile days, by which they are supposed to have unprotected sex when they want to get pregnant if their cycles are regular. (Clinical officer, Key informant 3).

"*Sometimes in the gynae clinic, you get one or two requests to offer PCC services. Also, in the wards, especially those who have lost pregnancies, they request for services for the next pregnancy that they are going to have or even PCC counseling. For those who have had caeserian section, you have to tell them to give the wound ample time to heal and should not conceive immediately. I usually give them two years after caeserean section (Doctor, Key informant 2).*

Another one said, "*For those who have had pregnancy loss, we give them Birth control pills to prevent them from getting pregnant during that time when they are taking the supplementation. Those whose causes are known, we send them for screening tests pending review. Those who lost pregnancies during the 2nd trimester, we send them for thyroid test, torches, and also for diabetes". (Doctor, Key informant 1).* Figure 4.1 and Table 4.6 display the results.

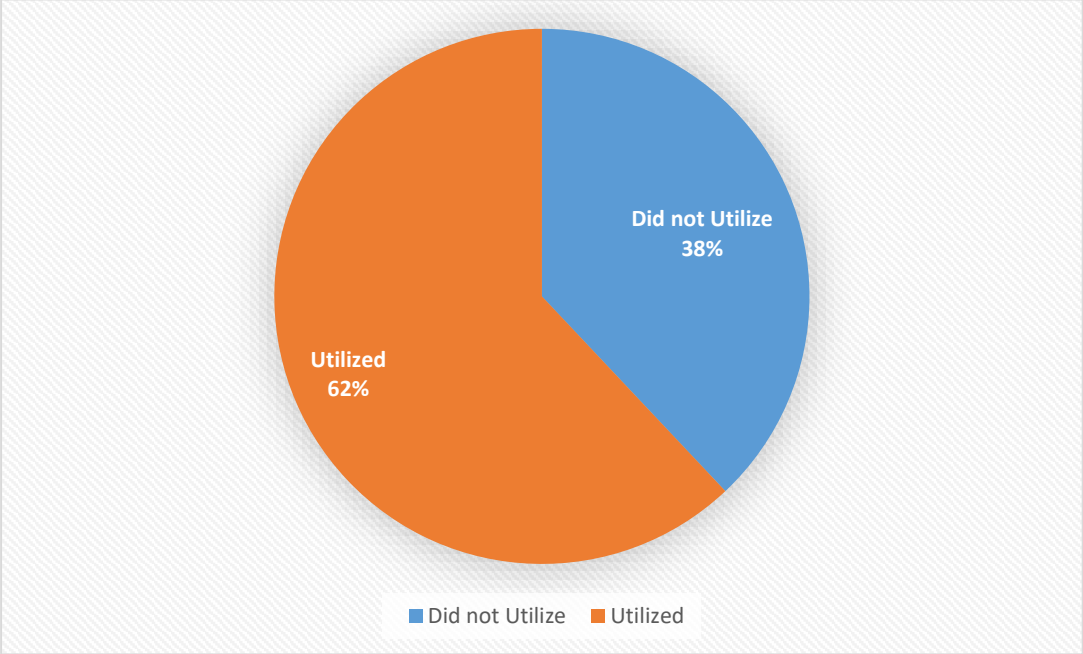

Figure 4.1: Level of Preconception Care Utilization by Women of Reproductive Age Attending Thika Level 5 Hospital

Table 4.6: Level of PCC utilization by women of reproductive age attending Thika level 5 hospital, as per the number of interventions

No. of Interventions per person	Frequency	Percent	Cumulative Percent
0	120	38	38
1	109	34.5	72.5
2	47	14.9	87.3
3	12	3.8	91.1
4	11	3.5	94.6
5	11	3.5	98.1
6	4	1.3	99.4
7	1	0.3	99.7
10	1	0.3	100
Total	316	100	

4.4.1: Type of PCC intervention utilized by the participants

Family planning (n=147; 46.5%) was the preconception intervention that was mostly utilized by the respondents before becoming pregnant. Vaccination was the second most common preconception intervention (n=68; 21.6%). Approximately 17% of the respondents (n=54) underwent nutritional counselling as a preconception intervention. Folic acid was used by 11.1% (n=35) of the respondents in the study. Six percent (n=19) of the respondents were assessed for previous pregnancy complications. Advice to stop drugs (alcohol/cigarettes and other drugs) and Genetic testing was done to 5.8% (n=18) and 5.7% (n=18) of the respondents respectively. Only eight respondents (2.5%) were treated for existing diseases, while six clients' (1.9%) drug/doses were changed. Infertility testing was the least utilized method, with only four respondents (1.3%) accessing the service. Table 4.7 shows the results.

Table 4.7: Preconception Care Interventions Utilized by the Participants

Intervention	Responses	Frequency	Valid Percent
Family Planning use	NO	169	53.5
	YES	147	46.5
Folic acid use	NO	280	88.9
	YES	35	11.1
Vaccination	NO	247	78.4
	YES	68	21.6
Genetic testing	NO	298	94.3
	YES	18	5.7
Nutritional counselling	NO	262	82.9
	YES	54	17.1
Treat existing diseases	NO	307	97.5
	YES	8	2.5
Change drug/dose	NO	310	98.1
	YES	6	1.9
Infertility screening	NO	312	98.7
	YES	4	1.3
Previous pregnancy	NO	297	94
complication assessment	YES	19	6
Advice to stop	NO	295	94.2
alcohol/cigarettes/others	YES	18	5.8

4.4.2: Preconception Care Utilization Related Issues

Majority of the people who offered the PCC services were nurses (55.2%; n=107), followed by doctors (33%; n=64). Other health care providers formed proportions of less than 10% each. Fifty-one-point eight percent (51.8%; n=100) received preconception care services in between the 1st, 2nd, and 3rd pregnancies, while 47.2 % (n=91) received the services before the first pregnancy. One respondent received the services before and one after marriage.

Reasons for not receiving the PCC services were indicated as follows; not aware (64.6%), not a priority (11.8%), I had no health problem (11.8%), unplanned pregnancy (7.9%), lack of time (2.4%), lack of money (0.8%) and some indicated pregnancy was a private affair (0.8%). Majority of the respondents (99.4%) said they would recommend PCC to other people.

Regarding who should offer preconception care services, the following were some of the responses.

"*I think nurses and clinical officers especially those who have done reproductive health have the knowledge, but there should be a referral system*" *(Doctor, Key informant 2).*

"*Nurses are the best to give preconception care as a first contact. Personally, I know about preconception care because I have been going for clinics at AKUH and MP Shah, and my information to clients because I was practicing in the rural areas. I used to tell mothers about folic acid, going for a scan before conception to check whether they have fibroids and personally, I have practiced. I was disseminating knowledge that I acquired during my ANC visits at AKUH & MP Shah" (Nurse, Key informant 2*).

One of the health care providers reported having offered PCC with positive results. *"One woman came with infertility and was referred to the fertility clinic, and she*

eventually conceived and came back to our clinic"(Clinical officer, key informant 2).

Table 4.8 displays the results.

Table 4.8: Preconception Care Utilization by Women of Reproductive Age-related issues

Preconception care uptake information	**Responses**	**Frequency**	**Valid Percent**
Who offered PCC	Nurse	107	55.2
	Doctor	64	33
	Clinical Officer	8	4.1
	Pharmacist	13	6.7
	Community Health Worker	1	0.5
	Nutritionist	1	0.5
When did you receive PCC	Before 1st pregnancy	92	47.7
	Between 1st & 2nd/ 2nd & 3rd pregnancy	101	52.3
Reasons for not receiving	Not Aware	82	64.6
	Lack of Time	3	2.4
	Lack of Money	1	0.8
	Not a Priority	15	11.8
	No Health problem	15	11.8
	Unplanned Pregnancy	10	7.9
	Pregnancy is a private Affair	1	0.8
Why women don't seek PCC	Lack of Information	170	54.1
	Religion	4	1.3
	Ignorance	51	16.2
	Fear	31	9.9
	Don't Know	28	8.9
	Controlling Partner	2	0.6
	Lack of Time	11	3.5
	Failure to plan for Pregnancy	9	2.9
	Feeling that they had no health problems	3	1
	Cost of care	4	1.3
	Feeling that pregnancy is a private affair	1	0.3
Whether one can recommend PCC to others	No	2	0.6
	Yes	314	99.4

4.5 Preconception care knowledge by women of reproductive age attending Thika level 5 Hospital

4.5.1 Participants' Knowledge on Preconception Care

The results from the questionnaire were corroborated with the key informant interviews of 16 participants, comprising of doctors, clinical officers, and nurses. Twenty questions were used to determine the participants' knowledge on preconception care. A study in Ethiopia by Yitayal et al (2017) on preconception care classified those who scored 50% or above of correct responses to preconception care knowledge questions as knowledgeable and those who scored less than 50% as not knowledgeable. In this case, those who scored 10 or above out of the 20 knowledge questions were considered knowledgeable. The preconception care knowledge was 41% (n=129), which was a low level of knowledge.

Low level of knowledge was also reported among the health care providers, as one key informant said, "*I would not want anyone to ask me about PCC because I don't know what to tell her" (Nurse, Key informant 2).* Lack of adequate knowledge by health care providers was also cited as a key factor in delivery of PCC services as quoted here below, "*I have no formal training on PCC but I have an idea what PCC is. I have heard of it in the line of duty from other nurses but have never been taught. I have also heard in mortality meetings*". *(Nurse, Key informant 5).* This was reiterated by another KI who said, *"I don't think I am competent enough because there could be so much that I don't know. Mostly from the comprehensive care centre (CCC), we refer those who are already pregnant, but I have heard of those who have come here with false pregnancy. They are taken for counseling because, personally, I am not trained for that. "I feel I am not knowledgeable and will need further training" (Nurse, Key informant 4).*

Some of the key informants had the relevant knowledge on PCC but had never practiced, like one who said, "*I was taught in college and it has been mentioned in workshops, but I have never practiced*" (*Nurse, Key informant,10*). Ignorance was observed among some health care providers who reported being unaware of the availability of PCC services at Thika level 5 hospital, while others who were actually offering some PCC services reported not having offered them. *"I have not heard of preconception care, but in those old days when we were in college, we were taught about nutrition and psychological preparation. I know only about those two things which I learnt in nursing and in counseling more than 30 years ago" (Nurse, Key informant 3).* Figure 4.2 displays the results of the level of knowledge assessed from the women of reproductive age.

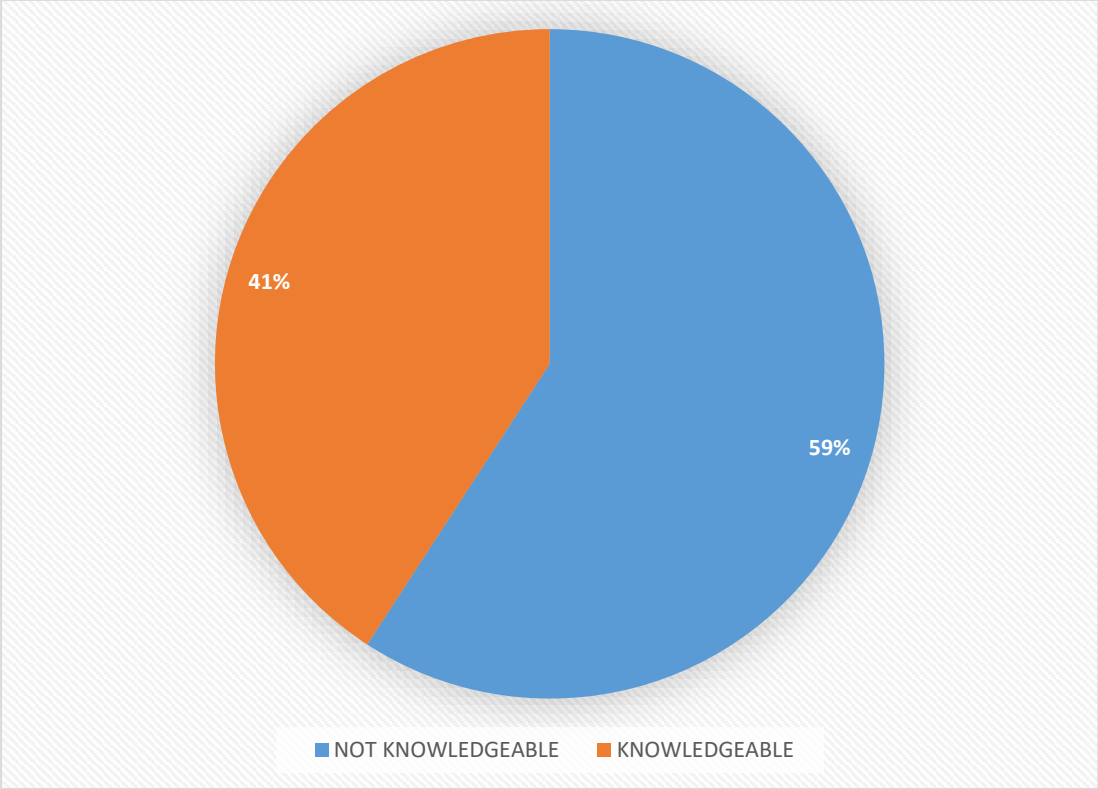

Figure 4.2: Participants' Knowledge on Preconception Care

4.5.2 Knowledge on Components of Preconception Care

Knowledge on components of PCC varied among the women of reproductive age as well as the key informants. Majority of the respondents (25%; n=79) identified testing/ treatment of STIs, including HIV, as a component of PCC, followed by advice to stop cigarette smoking, alcohol, and other drugs of addiction (24.7%; n=78) and immunization (23.4%; n=74). Other components identified by WRA were, nutritional counselling (23.1%; n=73), Family planning (22.8%; n=72), Pregnancy complication assessment (22.5%; n=71) Infertility screening (21.2%; n=67), disease treatment (20.9%; n=66), genetic counselling (18.7%; =59) and folic acid (17.4%; n=55). Some HCP also reported that they were not aware of the components of PCC.

The following were some of the responses from Key informants on preconception care knowledge.

"I don't know what is contained in preconception care, though I health educate mothers on use of IFAS before conception, natural FP, prolonged breastfeeding for child spacing, and anyone with chronic disease like hypertension and diabetes or heart disease, I refer them to the doctor or the RH clinical officer specialist" *(Nurse, Key informant 9).*

"I need training, but I wouldn't mind offering preconception care services, like now I have some information, I know about nutrition, abstinence from alcohol, and smoking. I have some knowledge, but I will not mind being trained. This is a training I would be very much interested to undertake" (Nurse, Key informant 3).

"*I have never practiced PCC, but we stabilize clients' blood sugars before conception and advise them to attend the diabetic comprehensive care unit for review of the treatment plan. They are monitored and advised on the appropriate time for conception,*

then they are actively monitored through pregnancy to delivery" *(Nurse, Key informant 10).*

"*When they come with infertility problems, we refer them to the RH clinic. That's what I do, and I don't know whether it's the right thing (laughs) or we refer them to OPD and the clinical officers there refer them for hormonal examination. But we give post-abortal care like family planning, return to fertility, tell them you can conceive at this time, if they are not on a method, you tell them about family planning" (Nurse, Key informant 3).* Table 4.9 displays the components of preconception care.

Table 4.9: Knowledge on Components of Preconception Care by Women of Reproductive Age

Component		Frequency	Percent
FP use	NO	10	3.2
	YES	72	22.8
Folic acid	NO	27	8.5
	YES	55	17.4
Infertility screening	NO	15	4.7
	YES	67	21.2
Genetic testing	NO	23	7.3
	YES	59	18.7
Nutritional Counselling	NO	9	2.8
	YES	73	23.1
Disease treatment	NO	13	4.1
	YES	66	20.9
Pregnancy complication assessment	NO	11	3.5
	YES	71	22.5
Test/treat STIs including HIV	NO	3	0.9
	YES	79	25
Advice to stop Alcohol/cigarettes & others	NO	4	1.3
	YES	78	24.7
Immunization	NO	8	2.5
	YES	74	23.4

4.5.3 Knowledge on who should utilize preconception care services

Most of the respondents (94%: n=295) felt that PCC services should be given to married couples, and 83% (n=260) to those intending to marry. Approximately 79.6% (n=249) said women with complications from previous pregnancies, 77.7% (n=244) women with chronic disease, 73%(n=229) women with infertility, 68.2% (n=214) men, and 60% (n=188) of the respondents said that adolescents should seek for PCC services. One KI, while responding to who should receive PCC, said, "*Preconception care services should be given early. Service provision should include adolescents and youths because this is where the problem starts*" (*Clinical officer, Key informant 1*). Some key informants felt that Partner involvement should be embraced for the success of PCC utilization. "*If one partner is involved and the other one is not, it will not work well; we should involve the partner. You see, like FP, even today, there are mothers who do it in secret. We have had cases where mama anataka mtoto na mzee hataki {the mother wants a baby but the husband doesn't}. If both come to the clinic, they are counseled. We should sensitize the community that the services are available and involve men in care (Nurse, Key informant 8)*. Another KI said, "*Clients should come to the clinic with partners and be taught on how a normal pregnancy and an abnormal pregnancy presents" (Nurse, Key informant 4).* Women with infertility were mentioned by one KI as those requiring PCC services. "*Those who seek PCC services are those who come with infertility problems, like in the gynae ward, they come because they have a problem with conception, mostly because they were on a method or they have hormonal problems" (Nurse, key informant 3).*

Table 4.10: Knowledge on the right people who should utilize preconception care services

Eligible persons	Response	Frequency	Percent	Valid Percent
Adolescents	NO	126	39.9	40.1
	YES	188	59.5	59.9
Men	NO	100	31.6	31.8
	YES	214	67.7	68.2
Married couples	NO	19	6	6.1
	YES	295	93.4	93.9
Intending to get married	NO	54	17.1	17.2
	YES	260	82.3	82.8
Women with infertility	NO	85	26.9	27.1
	YES	229	72.5	72.9
Women with chronic disease	NO	70	22.2	22.3
	YES	244	77.2	77.7
Complications in the previous pregnancy	NO	64	20.3	20.4
	YES	249	78.8	79.6
Don't know	1	8	2.5	100

4.5.4 Knowledge on timing for preconception care by Women of Reproductive Age

Eighty-six percent of the respondents believed that PCC should be sought before the first pregnancy. Approximately 48% of the respondents indicated that the services should be sought between pregnancies. The key informants had varied views on timings for PCC as indicated below.

"I am not sure of when a mother should go for PCC, but I think before the mother decides to become pregnant, and mostly the nulliparous and those who want to get married and their spouses so that things may go well" *(Nurse, Key informant 8).*

"*I feel information on preconception care should be shared at first contact because that could be the only time you are meeting with the client. some mothers will come to the*

clinic at 6 weeks, and the next contact they are pregnant. Every visit should be regarded as important because that is the only time you are sure of being in contact with this woman; if not, the next contact might be too late" (Nurse, key informant 6).

Table 4.11: Knowledge on Appropriate Timing for Preconception Care by Women of Reproductive Age

Pre conception care timing	Responces	Frequency	Percent	Valid Percent
Before 1st pregnancy	NO	43	13.6	14
	YES	265	83.9	86
Between pregnancies	NO	161	50.9	52.1
	YES	148	46.8	47.9

4.5.5 Association between Knowledge and Utilization of Preconception Care

Those who were knowledgeable were 2.69 times more likely to utilize preconception care as compared to those who were not knowledgeable (OR:2.69; 95% CI:1.647 to 4.407; p-value <0.001). Table 4.12 displays the results.

Table 4.12: Association between Knowledge and Utilization of Preconception Care by the participants

		Utilization of preconception care		**Total**	**Chi-square Value**	**Df**	**P-value**	**OR**	**95% Confidence Interval**	
		NO	**YES**						Lower	Upper
Knowledge level	**NO**	88	99	187						
		47.1%	52.9%	100.00%						
	YES	32	97	129	16.049	1	<0.001	2.694	1.647	4.407
		24.8%	75.2%	100.00%						
Total		120	196	316						
		38.0%	62.0%	100.00%						

4.6 Social Cultural Factors Associated with Utilization of Preconception Care

4.6.1 Decision Making and Partner Support among Women of Reproductive Age

Decision making on RH issues was being done mostly by both partners (67%); 29.2% solely made the decision, while 2.9% had decisions made solely by the partner. Some of the support given by the partners were: providing transport (74.3%), accompanying the wife to the clinic (45.6%), and supporting the decision to seek maternal health services (72.3%).

Table 4.13: Decision Making in Reproductive Health and Partner Support among women of Reproductive age

Reproductive health support	**Person responsible**	Frequency	Percent	Valid Percent
Decision Making in Reproductive Health Matters	Self	92	29.1	29.2
	Partner	9	2.8	2.9
	Both	211	66.8	67
	Other	3	0.9	1
Partner Support in Seeking RH Services				
Provide Transport	NO	79	25	25.7
	YES	228	72.2	74.3
Accompanied to the clinic	NO	167	52.8	54.4
	YES	140	44.3	45.6
Support the decision to seek maternal health services	NO	85	26.9	27.7
	YES	222	70.3	72.3
N/A	N/A	58	18.4	100

4.6.2 Common beliefs in the community that may affect utilization of preconception care services by women of reproductive age

Majority of the respondents felt that talking about an oncoming pregnancy (44.1%; n=138) was a taboo, and this hindered WRA from utilizing PCC services. Other beliefs that were reported to affect utilization of PCC were that RH issues should not be discussed with other parties except one's partner (41.5%; n=130). Others felt preconception care is a private affair (40.6%; n=127) and that it's not culturally right

to disclose your intentions to conceive to anyone (40.1%; n=126). This was reiterated by key informants who made the following responses.

"Community believes that getting pregnant is a personal business and it's not something that should be shared. Secondly, there is an attitude from the community about discussions on pregnancy" (Nurse, Key informant 6).

"*I usually teach clients about family planning, but some just decide to stop the methods without informing me or consulting a health provider for their viral loads to be checked, and the viral loads are done after they have already been exposed to unsafe sex. When asked the reason for their action, they say that it's because they wanted to conceive. Pregnancy for some people is like a taboo, and they want to keep it a secret. I think some of them nikama hawaelewi (is like they don't understand), you know they think that getting pregnant is personal. I think some of them feel like nawakataza". I think it has something to do with cultural beliefs because people do not want to talk about pregnancy until when you can't hide it anymore. (Clinical Officer, Key informant 4).*

"People feel it's a taboo to announce your intention to get pregnant" (Nurse, Key informant 2). "*Sitting with your daughter to discuss reproductive health matters is a taboo. Culturally, it's not right. It's a no-go zone" (Clinical Officer, Key informant 1).*

Slightly more than a quarter (26.9%; n=85) of the respondents indicated that religious beliefs prevent women of childbearing age from using pre-conception care in their community. This was in agreement with a key informant who said, "*Lack of knowledge and sometimes faith make people not to use PCC like the Akorino faith, for example, one woman had nine children but could not use family planning" (Nurse, Key informant 9)*

A lower percentage (9.2%) said that there were traditional beliefs in their community that prevent women of childbearing age from using pre-conception care.

Table 4.14: Common beliefs in the community affecting utilization of preconception care by women of reproductive age

Sociocultural factors	**Responses**	Frequency	Percent	Valid Percent
Religious belief	NO	231	73.1	73.1
	YES	85	26.9	26.9
Traditional Belief	NO	287	90.8	90.8
	YES	29	9.2	9.2
PCC is private	NO	186	58.9	59.4
	YES	127	40.2	40.6
Not culturally right	NO	188	59.5	59.9
	YES	126	39.9	40.1
Don't discuss RH matters except with the partner	NO	183	57.9	58.5
	YES	130	41.1	41.5
Taboo to talk about upcoming pregnancy	NO	175	55.4	55.9
	YES	138	43.7	44.1

4.7 Institutional Factors Associated with Utilization of Pre-Conception Care

4.7.1: Availability of PCC services at Thika Level Five Hospital

Slightly more than half of the respondents (50.3%, n=158) were not aware of the availability of PCC services at Thika level 5 hospital. The respondents indicated that they could get PCC services from the following areas; Family planning clinic (42.7%), MCH Clinic (30.1%), General outpatient Clinic (19.6%), Maternity unit (31.6%), Gynecology clinic (34.8%), any health practitioner's clinic (23.4%) and any Clinic in the hospital (21.8%).

Some of the key informants were not aware that preconception care services were available at Thika level 5 Hospital, as was evidenced by one nurse who said, "*There are no PCC services offered at the hospital because I have never dealt with them. I only meet them when they are pregnant. I don't know whether they are offered, I don't know whether I am ignorant, but I have never encountered any"*.

Most of the key informants reported that they had never received any training on PCC and hence had reservations about providing the services. "*I have no formal training on*

PCC, but I have an idea what PCC is. I have heard of it in the line of duty from other nurses, but have never been taught. I have also heard in mortality meetings". *(Nurse, Key informant 5).*

"I don't think I am competent enough because there could be so much that I don't know. Mostly from CCC, we refer those who are already pregnant, but I have heard of those who have come here with false pregnancy. They are taken for counseling because, personally I am not trained for that. "I feel I am not knowledgeable and will need further training" (Nurse, Key informant 4).

Another institutional factor hindering the utilization of PCC, as cited by HCPs, was a shortage of staff. Respondents felt that offering the services was an extra burden to the already overworked staff. "*Staff are already overworked and they feel this is an additional procedure and maybe it's not all that important, people will most likely prioritize curative services rather than preventive*" *(Clinical Officer, Key informant 4).*

Whereas Doctors reported having good knowledge on PCC, they indicated that there was no structured way of offering the services, nor were there staff who were specifically tasked with offering the services. In this regard, they proposed the need for the availability of structures with specific service provision areas and staff to attend to preconception care clients. The following were some of the responses:

"*I offer PCC services in the gynae clinic; there is nothing structured in the provision of PCC. There is no structured way of offering the services". "There is no elaborate clinic for PCC, but whenever there are opportunities, I usually offer PCC in the gynae ward, especially after 1st trimester pregnancy loss and those who have had early pregnancy complications. There is no clear-cut giving or anyone who has been given the responsibility of offering PCC. Most of these cases are picked during the ward rounds, and mostly it's the gynaecologists who do it. Other areas where PCC could be*

given like MCH/FP clinic, I don't think there is room for that".(Doctor, Key informant 2)

"There is lack of an established clinic, a client comes and enquires from you, and there is nowhere you can direct them to, it discourages the client". .(Nurse, Key informant 2)

"We should have a PCC clinic on its own like the way we have a diabetic clinic, CCC, and well baby clinic. That's why we had suggested that we have a room in MCH whereby people will come directly, like the way young girls come for FP, where anyone can walk in, consult, and then leave" (Nurse, Key informant 1).

Table 4.15: Women of reproductive age awareness of availability of preconception care services at Thika Level 5 Hospital.

Service provision areas	Responses	Frequency	Percent	Valid Percent
Availability at TL5H	NO	158	50	50.3
	YES	156	49.4	49.7
FP Clinic	NO	22	7	14
	YES	135	42.7	86
MCH Clinic	NO	40	12.7	25.5
	YES	117	37	74.5
General Outpatient	NO	95	30.1	60.5
	YES	62	19.6	39.5
Maternity	NO	57	18	36.3
	YES	100	31.6	63.7
Gynecology clinic	NO	47	14.9	29.9
	YES	110	34.8	70.1
Any Healthcare Practitioner	NO	83	26.3	52.9
	YES	74	23.4	47.1
Any Clinic in Hospital	NO	87	27.5	55.8
	YES	69	21.8	44.2

4.7.2 Factors that Affect Maximum Utilization of Preconception Care Services at Thika Level 5 Hospital

The most common factor that affected maximum use of PCC was long queues in the hospital (67.4%), while slightly more than half of the respondents indicated that cost of reproductive health services (52.8%) and distance from the health facility (52.2%) were hindrances to maximum utilization of PCC by women of reproductive age. More than 70% of the respondents felt that health care practitioners, unavailability of services, and lack of privacy had no effect on maximum utilization of PCC. Some key informants reported that previous trauma and fear of negative reports had effects on utilization of PCC and had this to say, "*sometimes people fail to go for PCC due to trauma, if someone had an incident that happened in the hospital, it reminds them of the incident and hence don't want to seek health services*"(*Clinical Officer, key informant 3*). Another key informant said, "*There is fear, especially for those who have been unable to conceive, fearing people's perception or negative judgment. They wonder whether they are going to be declared barren*". *(Nurse, Key informant 7)*

Lack of policy and policy guidelines was cited as a key factor affecting utilization of PCC. A health care provider said, **"***There are international guidelines on PCC, but there are no policy guidelines in Kenya. I have not encountered specific PCC policy guidelines, but only the combined National guidelines on quality obstetrics and perinatal care, which was launched recently; there are only international guidelines, but local ones are not available. I don't remember seeing one"(Doctor, Key informant 1).*

Table 4.16: Factors that affect Maximum utilization of Preconception Care at Thika Level 5 Hospital

Variables	Response	Frequency	Percent	Valid Percent
Cost of Reproductive Health Services	NO	132	41.8	44.1
	YES	167	52.8	55.9
Distance	NO	134	42.4	44.8
	YES	165	52.2	55.2
Long Queues	NO	86	27.2	28.8
	YES	213	67.4	71.2
Healthcare Practitioners' issues	NO	246	77.8	82.6
	YES	52	16.5	17.4
Unavailability of services	NO	226	71.5	75.8
	YES	72	22.8	24.2
Lack of privacy	NO	244	77.2	82.4
	YES	52	16.5	17.6
None	YES	44	13.9	100

4.7.3 Recommendations to the government and Thika Level 5 Hospital for increasing utilization of preconception care by women of reproductive health

Majority of the respondents (62.3%) recommended the need to create awareness to increase utilization of PCC. Some key informants stated that they had a role to play in increasing utilization of preconception care, and one had this to say: "*Nurses should be proactive in sensitizing the mothers; some mothers are surprised to hear about IFAS before pregnancy. Let them know about preconception care even if they are coming for antenatal, family planning, or child welfare clinic*"(*Nurse, Key informant 4).*

Another KI said*, "We need to be proactive, not wait until they come to us. The hospital should keep updating staff and on job training. If I don't know about PCC, I don't want to go out there and start confusing people. We should also have policy guidelines"(Clinical Officer, Key informant 4).* The need to separate PCC related services from other health services was cited as one way to encourage WRA to seek the services as was the comment of one KI who said "*Decentralization of the common*

services to RHU to avoid long ques and waiting time like pay points, pharmacy, U/S would encourage clients to seek reproductive health services"(Nurse, Key informant 3).

Provision of quality care (20.6%) and reduction of cost of care (10.8%) were some of the measures that were recommended by respondents that could help increase utilization of PCC. Hiring of more staff (8.2%) and availability of all services (2,2%) were also recommended.

Table 4.17: Recommendations by Women of Reproductive Age for Increasing Utilization of Preconception care at Thika Level 5 Hospital

Recommendations	Responses	Frequency	Percent
Create awareness	NO	1	0.3
	YES	197	62.3
Hire more staff	YES	26	8.2
Provide quality care	YES	65	20.6
Reduce cost	YES	34	10.8
Avail all services	YES	7	2.2

4.7.4: Association Between Social Cultural Factors and Utilization of Pre-Conception Care

The person making a decision to seek PCC services did not affect utilization of the service (p-value 0.999). People who were not supported with transport were 47.7% less likely to utilize PCC services (COR: 0.523; 95%CI: 0.311 to 0.879; p-value:0.014). There was no statistically significant difference between those who were accompanied and those not accompanied to the clinic by their partners in the utilization of PCC (p-value 0.464). There was no statistically significant difference between those who were supported to make decision and those not supported in making decision to seek maternal health services in the utilization of PCC (p-value 0.717). Those who agreed there was presence of religious beliefs that prevent women of childbearing age from using pre-conception care services were 56.2% less likely to utilize PCC services as

compared to those who disagreed of the presence of religious beliefs (COR 0.438; 95% CI:0.251 to 0.764; P-value 0.004). There was no statistically significant difference between those who agreed that the presence of traditional beliefs may affect use of pre-conception care in the community and those who disagreed (p-value 0.051). Other socio-cultural factors were not statistically significant. Table 4.18a and 4.18b display the association between socio-cultural factors and utilization of PCC.

Table 4.18.1: Association between Social Cultural Factors and Utilization of Preconception Care

Factors	B	df	P-value	COR	95% C.I. for COR	
					Lower	Upper
Decision maker		3	0.387			
Self	21.421	1	0.999	2009491128	0	
Partner	21.896	1	0.999	3230946520	0	
Both	21.861	1	0.999	3118760877	0	
Constant	-21.203	1	0.999	0		
Other	Reference					
Not provided transport	-0.648	1	**0.014**	**0.523**	**0.311**	**0.879**
Constant	0.673	1	<0.001	1.961		
Transport Provided	Reference					
Accompanied to the clinic	0.173	1	0.464	1.189	0.748	1.889
Constant	0.405	1	0.019	1.5		
Not accompanied	Reference					
Support the decision to seek maternal health services	-0.333	1	0.2	0.717	0.431	1.193
Constant	0.593	1	0	1.81		
Not supported in making decision to seek maternal health services	Reference					

Table 4.18.2: Association between Social Cultural Factors and Utilization of Preconception Care

Factors	B	df	P-value	COR	95% C.I. for COR	
					Lower	Upper
Presence of religious beliefs that prevent women of childbearing age from using pre-conception care	-0.827	1	**0.004**	**0.438**	**0.251**	**0.764**
Constant	1.114	1	0	3.048		
Absence of religious beliefs that prevent women of childbearing age from using pre-conception care	Reference					
Presence of traditional beliefs that may affect the use of pre-conception care in the community	-0.927	1	0.051	0.396	0.156	1.002
Constant	1.344	1	0.003	3.833		
Absence of traditional beliefs that may affect the use of pre-conception care in the community	Reference					
PCC is a private affair	0.232	1	0.328	1.261	0.793	2.005
Constant	0.366	1	0.042	1.442		
PCC is NOT a private Affair	Reference					
not culturally right	0.406	1	0.086	1.501	0.944	2.386
Constant	0.255	1	0.155	1.291		
culturally right	Reference					
Community beliefs that you should not discuss reproductive health issues except with your partner	0.366	1	0.121	1.441	0.908	2.288
Constant	0.279	1	0.116	1.321		
Community beliefs that you should discuss reproductive health issues except with your partner	Reference					
It’s a taboo to talk about an oncoming pregnancy	0.414	1	0.078	1.512	0.955	2.395
Constant	0.262	1	0.127	1.3		
It’s not a taboo to talk about an oncoming pregnancy	Reference					

4.8 Association between Institutional Factors and Utilization of Preconception Care.

The WRA who were not aware whether preconception services were available were 48.5% less likely to utilize the services (COR: 0.515; 95%CI: 0.324 to 0.819; p-value 0.005). Those who said the long queues were not a hindrance to utilization of PCC were 1.7 times more likely to utilize PCC services (COR: 1.718, 95%CI: 1.002 to 2.946; p-value 0.049). Other institutional factors were not statistically significant. Table 20 displays the association between institutional factors and utilization of PCC.

Table 4.19: Association between Institutional Factors and Utilization of Preconception Care.

Factors	B	df	p-value	COR	95% C.I. for COR	
					Lower	Upper
Preconception care services are not available	-0.664	1	**0.005**	**0.515**	**0.324**	**0.819**
Constant	0.841	1	<0.001	2.319		
Preconception care services are available	Reference					
Where one can get PCC services						
family planning clinic	0.151	1	0.769	1.163	0.425	3.185
Constant	0.83	1	<0.001	2.293		
MCH clinic	0.328	1	0.431	1.387	0.614	3.134
Constant	0.771	1	<0.001	2.162		
Gen outpatient	0.682	1	0.054	1.977	0.988	3.957
Constant	0.46	1	0.078	1.583		
Maternity	-0.251	1	0.483	0.778	0.385	1.571
Constant	0.944	1	<0.001	2.571		
Gyn clinic	0.157	1	0.684	1.17	0.549	2.493
Constant	0.804	1	<0.001	2.235		
Any hcp	-0.264	1	0.453	0.768	0.386	1.529
Constant	0.993	1	<0.001	2.7		
Any clinic in hospital	-0.222	1	0.53	0.801	0.4	1.602
Constant	0.968	1	<0.001	2.632		
Distance	0.327	1	0.177	1.386	0.863	2.227
Constant	0.355	1	0.025	1.426		
Long queues	0.541	1	**0.049**	**1.718**	**1.002**	**2.946**
Constant	0.351	1	0.012	1.42		
HCP issues	-0.491	1	0.14	0.612	0.319	1.175
Constant	0.903	1	0.003	2.467		
Unavailability of services	-0.163	1	0.565	0.85	0.488	1.479
Constant	0.631	1	0.011	1.88		
lack of privacy	-0.151	1	0.636	0.86	0.459	1.609
Constant	0.636	1	0.029	1.889		

4.9 Taking care of confounding

All the factors that were significantly associated with utilization of PCC were entered into a multivariate analysis to adjust the odds ratios and take care of confounding. Those who were not aware of the availability of the PCC services were 40.5% less likely to utilize the services as compared to those who were aware (AOR: 0.595; 95%CI: 0.36

to 0.985; p-value 0.044). Respondents who indicated that religious beliefs affect utilization of PCC were less likely to utilize the service as compared to those who said they were absent (AOR: 0.395; CI: 0.214 to 0.729; p-value 0.003). Those who were not supported with transport were 58% less likely to utilize PCC services (AOR: 0.421; 95CI: 0.239 to 0.744; p-value 0.003). Respondents who believed that long queues did not affect utilization were 1.99 times more likely to utilize PCC services as compared to those who agreed long queues affect utilization (AOR: 1.993; 95% CI: 1.121 to 3.545; p-value 0.019). Table 21 displays adjusted odds ratios for factors associated with utilization of PCC.

Table 4.20: Adjusted Odds Ratios for Factors Associated with Utilization of Preconception Care in Thika Level Five Hospital

Factors	**B**	**S.E.**	**Wald**	**Df**	**Sig.**	**AOR**	**95% C.I. for AOR**	
							Lower	Upper
Not Aware of Availability at TL5H	-0.519	0.257	4.074	1	0.044	0.595	0.36	0.985
Rel. belief	-0.929	0.313	8.809	1	0.003	0.395	0.214	0.729
Not provided with transport	-0.864	0.29	8.896	1	0.003	0.421	0.239	0.744
Long queues	0.69	0.294	5.51	1	0.019	1.993	1.121	3.545
Constant	1.514	0.313	23.348	1	0	4.546		

CHAPTER 5: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Discussion

5.1.1 Utilization of preconception care

Preconception care (PCC) is necessary to identify and deal with risk factors before conception (Ukoha & Mtshali, 2022). Its role is to reduce both maternal and child mortality and morbidity rates. This study was conducted to assess utilization of Preconception care among women of reproductive age. If a woman received at least one type of PCC intervention, either advice, treatment, or lifestyle modification care, at least once before becoming pregnant, she was considered to have utilized PCC (Demisse et al., 2019; Asresul et al, 2019).

From this study, utilization of PCC was good, with more than half of the respondents having utilized at least one form of preconception care. This was contrary to a study conducted in Ethiopia, where only 18.2% had utilized at least one form of PCC, and another study done in Kenya, where utilization of PCC was 25.8%, with utilization in the rural area at 16.5 and urban 35.1% respectively (Okemo et. al, 2021). This may have been as a result of the small sample size used and the fact that data was collected from both rural and urban setups. It was also higher than a study that was conducted at Machakos level 5 hospital, where utilization of preconception care was 14.6% (Owino, Oluchina &Nyariki,2022). This may have been due to diversities in community practices and beliefs.

Family planning was the highest form of PCC that the respondents used. This was lower than findings in two studies conducted in southern Ethiopia by Habte, Dessu and Haile (2021) and Wagene et.al (2021), where more than 50% of WRA had used modern family planning methods but higher than the findings of another study conducted in Kenya at Kaduyi in Bungoma county, where only 39% had used family planning

(Mukhalisi, Iseme & Musila,2022). Utilization of vaccines (22%), nutritional counseling (17.1%), and folic acid (11.1%) were low in this study compared to findings in the Ethiopian study, where 67.2% of the respondents had utilized folic acid supplementation and 61.9% had used vaccination (Habte, Dessu & Haile,2021).

Most of the respondents (51.8%) utilized preconception care after the first pregnancy, and the mean age was 26.29. Majority were between the ages of 23 to 27 years at thirty-four-point two (34.2%) percent. At this stage majority of WRA have just finished the mid-level colleges or institutions of higher learning, and majority could be in relationships pending marriage. This demonstrates the need for sensitization, awareness creation, and preconception counseling in these institutions. From the findings in this study, there is need to create awareness in secondary schools because 28% of the respondents were between the ages of 18 and 22 years; the age at which most of these WRA complete secondary schools, join colleges, and others are about to graduate. This will be early enough to reduce the number of unplanned pregnancies, which was 29.4% and complications associated with pregnancy and childbirth.

Majority (70.6%) of the respondents had planned their pregnancies, which was likely to have been contributed by the high rate of preconception care utilization (62%), especially family planning. Utilization of preconception care was also confirmed by some healthcare providers who reported that there are some women who walk to healthcare providers seeking for PCC services. Others reported providing the services or having witnessed services being offered to WRA. However, there was evidence of lack of understanding on PCC by some health care providers who were not aware that some of the services they were offering to clients were actually preconception care services. There is therefore need for training of HCP to impart knowledge and create awareness amongst them. This was also observed among women of reproductive health

who reported not knowing what PCC was but had actually utilized some PCC services. This could have been the reason why utilization of preconception care was high while knowledge was low.

Majority of the respondents had a good level of education, with 45.9% (N=145) having attained tertiary education and 43% (N=136) secondary education, which is an indication that the level of education plays a part in preconception care utilization. This was in line with a Kenyan study by Okemo et al (2020), which showed that educated women were more compliant to PCC. The findings were also similar to a study conducted in Abakaliki, South East Nigeria that the level of education had a role to play in utilization of preconception care (Ekem et al,2018).

More women (44.8%) were in some form of employment than their spouses (19.4%). This shows that economic empowerment had a role to play in utilization of PCC by WRA. This was also evidenced by the fact that More than half of the respondents (53.2%; n=168) paid their hospital bill in cash.

Slightly more than a quarter (26.3%) of the respondents had a family history of chronic diseases. This population is at risk of negative pregnancy outcomes that can be prevented through utilization of PCC. This emphasizes more on the need to create awareness and initiate a formal way of providing PCC services to increase its uptake and prevent missed opportunities.

Difficulties in the current pregnancy, health challenges with previous pregnancies, medical health-related issues, economic hardships, and unstable families were some of the reasons why most respondents had no intentions of having more children. Some factors like unstable families could lead to violence, physical or psychological trauma, while hard economic experience is likely to lead to poor nutrition, and this could lead

to complications in future pregnancies like postpartum haemorrhage, hence the need for pre-conception counseling to both women of reproductive age and their partners.

Preconception care services were mostly offered by nurses (55.2%). This could be because nurses make up a high workforce in health facilities and offer most of the services. Majority of the key informants felt that nurses were in a better position to offer PCC because they are usually the first contact with clients and spend more hours with them. However, Majority of the KI felt that systems, policies, and guidelines were not in place to guide the health care providers in PCC service provision. Interviewed HCPs felt that these were some of the key factors that were hindering maximum utilization of PCC and should be addressed by both the national and the county governments.

More than half (64.6%) of the respondents who never utilized PCC services said that they were not aware that the services existed. Majority of them felt that the reason why women of reproductive age don't utilize PCC services was due to lack of information. Some KI said that HCP should be proactive in providing care and the required information on PCC to increase utilization. Most of the respondents (99.4%) were positive about PCC and reported that they would recommend it to other women of reproductive age. Therefore, with good sensitization and awareness creation, the level of PCC utilization could increase and help improve pregnancy outcomes, which could culminate in a reduction of both maternal and child morbidity and mortality rates.

5.1.2 Knowledge on preconception care

The level of knowledge on PCC among WRA was low (41%), which was similar to a study conducted in Bungoma county on utilization of PCC services among couples, where the level of knowledge was also 41% (Mukhalisi, Iseme & Musila,2022). The study also revealed that the level of awareness was low since only 29.7% (n=94) of the respondents reported having ever heard about PCC. This was higher than findings in a

study that was done in western Nigeria on awareness and perception of preconception care among women in Usmanu Danfodiyo University Teaching Hospital, Sokoto, where only 20.61% were aware of PCC services (Umar et. al, 2019). It was also higher than findings in a study done at Moi teaching and referral hospital, where 83% were not aware of preconception health care services.

Testing and treatment of STIs including HIV, was the most popular component of PCC that was known to the women of reproductive age at 25%. This was probably due to availability of PMTCT policies and guidelines, making the services known by both health care providers and women of reproductive age. Besides, these services are routinely offered to antenatal and postnatal mothers at MCH/FP and CCC clinics. Most of the HCP recommended that the government should provide specific guidelines for PCC to increase awareness and utilization of the services.

Forty-four point seven percent (44.7%) of the respondents heard about PCC from health care providers, which was lower than a Nigerian study where 70.4% heard about PCC from HCP (Umar et. al, 2019). Reports from TL5H also show that 29.8% heard about PCC from friends,12.8% from the media, and 10.6% from relatives. This is an indication of how much improved awareness creation could contribute to enhancing utilization of PCC services through the above-mentioned sources of communication. Research by McGrady et. al (2021) found that conversations by WRA with family and friends impacted on them.

A low level of knowledge on PCC was also evident among the health care providers. Despite the fact that some HCP made effort to offer PCC in some service provision areas, lack of understanding of the services and their importance among WRA seemed to hamper their efforts.

The low PCC knowledge level among HCP especially the nurses may have been as a result of inadequate PCC content coverage in their syllabus and lack of emphasis on the importance of the services; minimum time given in teaching the basic PCC curriculum; the fact that the content is usually not examinable and the fact that there are no clinical placement requirements for PCC during training of nurses. This may have contributed to the narrow body of knowledge, lack of on-the-job training (OJT), and the fact that people will prioritize CMEs on obstetric emergencies as opposed to the normal or preventive processes. However, though some nurses had inadequate knowledge and may not have been channels of passing information to clients, there is a likelihood of WRA knowing about PCC through other sources of information and especially due to the influence of technology.

More than 70% of the respondents felt that married couples, those intending to get married, women with infertility, women with chronic diseases, and those who had complications in the previous pregnancies should be the ones to receive preconception care. The smallest percentage (59.5%) accepted that adolescents should also receive PCC. A key component of PCC is counseling, which would be very beneficial to adolescents in prevention of unwanted pregnancies and induced abortions. Male involvement was positively mentioned as an important aspect of PCC, with 68.2% (n=214) of respondents supporting that men should also receive preconception care. This is an important group as the results indicated that partner support had a role to play in utilization of PCC services. There is therefore need for health care providers to increase PCC awareness among these two cohorts in order to enhance its utilization and reap the benefits associated with the services.

5.1.3 Social Cultural Factors associated with utilization of preconception care

Lifestyle modification is one of the components of preconception care. This study revealed that more respondents used alcohol (25.6%) and other drugs (0.9%) than their partners which was 18.1%. and 0.6% respectively, while more spouses were smokers (4.8%). These substances can influence decision-making, thus hindering the utilization of PCC. There is therefore need to offer counseling on cessation of use of these substances before conception to prevent risks such as PET, placenta abruption, foetal alcohol spectrum disorders (FASDs), abortions, still births, and prematurity, among others, after conception.

Most decisions to seek reproductive health services were made by both partners (67%), and transport provision was the most common form of support (74.3%) that respondents received from their partners. This might have contributed positively to the high level of PCC utilization.

Quite a number of respondents, as well as key informants, reported that generally discussion surrounding pregnancy was not acceptable and should be privy to the responsible parties. Hence, it is considered a taboo. This belief can be demystified through health education on what PCC means and its role in the lives of WRA and their families.

Although most of the key informants supported provision of preconception care, the researcher established that some HCP shared some cultural beliefs with the respondents, like one who stated that he could not sit with her daughter to discuss RH issues. This calls for the need to create awareness through various forums like the electronic, print, or social media in order to reach a high population, including the youth to bridge the knowledge gap.

Partner involvement came out as an important factor that could bring success in utilization of PCC. The belief that reproductive health is for women should be demystified by encouraging male participation in the uptake of RH services, including PCC. Other social cultural factors that featured were religion and fear of negative reports. There is therefore a need to train HCP to equip them for PCC awareness creation and provision of health education to the community on the benefits of PCC at every available opportunity.

5.1.4 Institutional factors associated with utilization of PCC

This study revealed that there was a knowledge deficit on preconception care among health care providers. This was in concurrence with a study carried out by Abayneh et al. (2022), which reported that there was poor knowledge and practice of preconception care among most of the health care providers. Some of the institutional factors affecting utilization of PCC were knowledge deficit on PCC by health care providers especially nurses, shortage of staff, lack of dedicated space to offer PCC services, lack of resources, and cost of PCC services. Most of the KI reported that they had received little or no training on PCC and hence could not effectively offer the services. Those who reported having knowledge on PCC were managers who heard about it in monthly multidisciplinary meetings and a few staff who heard in maternal audit forums. Some health care providers had knowledge on PCC but never practiced.

Shortage of staff featured as a major factor with HCP, especially nurses reporting that they were already overworked and offering PCC would be an additional burden. In this regard, they felt that specially trained staff should be deployed to offer the services. Decentralization of RH services and availability of standalone PCC clinics, where men and women will just walk in and receive the services to minimize long queues was recommended.

Generally, there was evidence of lack of understanding of the definition of PCC among the KI as some of them either reported that no PCC services were offered at TL5H at the beginning of the interview only for them to mention them as part of the daily care they offer to clients. This was also common among the clients who reported having no knowledge on PCC but had utilized at least one or more PCC services. There is therefore need to impart knowledge and create awareness especially among the nurses who spend most of their time providing direct care to patients and clients. In return, they will create awareness to the community and utilization of PCC will be enhanced. Doctors who were interviewed reported having adequate knowledge and were well prepared to offer the services, but nurses and clinical officers felt they had knowledge deficit and needed further training on PCC. This was in agreement with an Ethiopian study that reported that there was poor knowledge and practice of PCC among majority of health care providers (Abayneh et. al, 2022). Some of the health care providers reported that PCC had positive pregnancy outcomes and expressed a willingness to offer PCC services.

Though the interviewed doctors reported offering PCC services, they reiterated that there was no formal ways of doing it. This was in concurrence with a study conducted by Wanyonyi and Abwalaba (2019), who reported that no records were available to ascertain whether PCC services were being provided in the hospital. Respondents felt that there was need for a standalone PCC policy and guidelines for HCP to be aware and implement regular provision of PCC services. The health care providers recommended that the government should create policy frameworks to include PCC provision in all service provision areas. The KI suggested that the policy and guidelines should be a replica of the PMTCT that all mothers should seek PCC to increase uptake of the services.

Findings from this study, therefore, point to the need for awareness creation and impartation of knowledge to HCP to help them comfortably offer the services. There is also need to create awareness to WRA on availability and importance of PCC early enough for increased utilization of the services.

5.2 Conclusion

Preconception care utilization by WRA attending TL5H was good at 62% with family planning being the most popular. This may have been due to sensitization and awareness creation usually done in hospitals through training of health care providers, availability of guidelines, health talks, and also through different media platforms. This shows the impact of awareness creation and the same strategies can be utilized to enhance uptake of preconception care. However, this should be done as early as in secondary schools and in colleges, as the majority of the study participants were youths between the ages of 23 and 27years.

The level of knowledge for the respondents was 41% which was low. A disconnect between PCC practices and Knowledge from both the HCPs and the women of reproductive age was observed. From the findings of the study, there was a strong association between knowledge and utilization of preconception care, where those who were knowledgeable were more than 2.5 times likely to utilize the services. Hence, lack of knowledge can be a major hindrance to the provision and uptake of preconception care and needs to be addressed.

Sociocultural factors associated with utilization of PCC were unhealthy lifestyle practices like alcoholism and drug abuse, partner support, and religion. This shows the need for early sensitization on lifestyle modification among the youths who were the majority in the study. Cessation of use of alcohol and other addictive substances before conception minimizes risks such as PET, placenta abruption, foetal alcohol spectrum

disorders (FASDs), abortions, still births, and prematurity, among others. Hence, for a healthier future generation, preconception care should be overemphasized in the health sector.

Institutional factors associated with utilization of PCC included health care providers' knowledge, availability of PCC services, cost of health care services, staffing, long queues, and distance to the health facility. There is need to provide specific training of health care professionals on preconception care to ensure that they acquire the relevant skills and confidence while providing the services. The empowered health care professionals in return, will utilize the acquired knowledge to create awareness among women of reproductive age; seek solutions to other institutional factors like human resources, long queues, and eventually enhance the uptake of preconception care.

5.3 Recommendations

5.3.1 Recommendations from study findings

1. Thika level 5 hospital management to initiate a training program for nurses, whereby Doctors will facilitate in workshops to bridge the knowledge gap and increase awareness. This is because doctors reported having good knowledge on PCC acquired during their training, and one of the consultants was a PCC lecturer at one of the renowned Universities in Kenya.
2. Thika level 5 hospital management to introduce a comprehensive preconception care centre/unit where all PCC services will be provided under one roof. This will increase awareness among WRA and address the problem of long queues for clients willing to seek the services in the hospital.
3. Thika level 5 hospital to enhance counseling and health education among WRA in all service provision areas and within the first contact in order to sensitize

them on PCC and provide information on the effects of alcohol, cigarettes, and other drugs of addiction to the mother and the unborn child at first contact.

4. Thika level 5 hospital management to make use of social media, social gatherings, religious meetings, and political gatherings to disseminate information on preconception care and reach a wide range of clients.

5.3.2 Recommendation for further research

The researcher recommends further studies on:

1. Impact of preconception care among women of reproductive age
2. The role of constructive male involvement in preconception care

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APPENDICES

Appendix I: Informed Consent Form

My name is Felister Kamau of the Nursing Council of Kenya. I am a Master of Public Health (reproductive health) student from Kenyatta University. I am conducting a study titled "**Utilization of pre-conception care (PCC) services among women of reproductive age at Thika level five hospital, Kiambu county.**"

The information will be used to devise ways of improving the uptake of PCC services, which will contribute to healthy pregnancy outcomes, hence reducing severe disease and deaths among women of reproductive age.

Procedures to be followed

Participation in this study will require that I ask you some questions and take note of your responses. This study does not require you to provide any samples/ specimens. I will record the information you provide in a questionnaire.

Voluntarism

You have the right to refuse participation in this study. You will get the same services and care whether you agree to join the study or not, and your decision will not change the care you will receive. Please remember that participation in this study is voluntary. You may ask questions related to the study at any time.

You may refuse to respond to any questions, and you may stop the interview at any time. You may also stop being in the study at any time without any consequences to the services you receive here or any other organization now or in the future.

Discomforts and Risks

Some of the questions you will be asked may make you uncomfortable. If this happens, you may refuse to answer these questions if you so choose. You may also stop the interview at any time. The interview may add approximately half an hour to the time you take at the clinic after you receive your routine services.

Due to the COVID-19 pandemic, all protocols will be observed by having both the interviewer and the interviewee wash their hands, keeping social distance, and putting on masks throughout the interview.

Benefits

There are no direct benefits for you as an individual participant. However, if you participate in this study, you will help us to learn how the hospital can improve the level of utilization for preconception care services and the health of women of reproductive

age for better pregnancy and delivery outcomes through prevention and management of possible risks before conception.

Reward

There are no rewards or any payment to you if you participate in this study.

Confidentiality

The interviews will be conducted in a private setting within the clinic. Your name will not be recorded on the questionnaire. The questionnaires will be kept in a locked cabinet for safekeeping at Kenyatta University. Everything will be kept private and only shared with the study team.

Contact Information

If you have questions about the study, call my Supervisors, Dr. Eliphas Gitonga 0721406609 or Dr. Rosebella Kipkalom 0721593173 /Investigators Tel No: 0722324653.

However, if you have questions about your rights as a study participant, you may contact the Kenyatta University Ethical Review Committee Secretariat on chairman.kuerc@ku.ac.ke.

Participant's statement

The above information regarding my participation in the study is clear to me. The study has been explained to me, and I have been given a chance to ask questions, and my questions have been answered to my satisfaction. My participation in this study is entirely voluntary. I understand that my records will be kept private and that I can leave the study at any time. I understand that I will still get the same care and medical treatment whether I decide to leave the study or not, and my decision will not change the care that I will receive from the clinic today or that I will get from any other clinic at any other time.

Name of Participant: ……...

Signature or Thumbprint: ……. Date: …….

Name of Representative/Witness (where necessary)

Investigators statement

I, the undersigned, have explained to the volunteer in a language s/he understands the procedures to be followed in the study, and the risks and benefits involved

Name of Interviewer: ……

Signature: …… Date: ……

Appendix II: Study Participant's Questionnaire

Date: …….

Instructions.

i) Please do not write your name on the questionnaire

ii) Information provided will be treated with confidentiality

iii) You are requested to answer all the questions

iv) Feel free to seek clarifications where required

Section1: Socio : Socio-demographic data

1. Age in years: ……. ……
2. Residence: ……
3. Marital status:

   Single: ☐ Married: ☐ Separated: ☐ Divorced: ☐ Widowed: ☐
4. Religion:

   Catholic: ☐ Protestant: ☐ Muslim: ☐

   Others (state): ……
5. Level of education:

   i. None: ☐

   ii. Primary: ☐ Completed ☐ Not completed ☐

   iii. Secondary: ☐ Completed ☐ Not completed ☐

   iv. College/ university: ☐ Completed ☐ Not completed ☐

<u>Social economic characteristics</u>

6. Occupation:

   i) Student: ☐ a. Middle level ☐ b. Undergraduate ☐ c. post graduate ☐

   ii) Housewife: ☐

   iii) Formal Employment: ☐

   iv) Casual Labourer: ☐

   v) Self-Employed: ☐

   vi) Other (specify) ……
7. Partner's occupation

   i) Student: ☐ a. Middle level ☐ b. Undergraduate ☐ c. post graduate ☐

   ii) Formal Employment: ☐

iii) Casual Labourer: ☐

iv) Self-Employed: ☐

v) Other (Specify)

8. How do you cater for your medical care expenses?

   i. Cash payment: ☐

   ii. Medical insurance cover: ☐

      a) Private cover ☐

      b) NHIF ☐

9. If on a medical insurance cover, does your insurance scheme cover all the health services?

   Yes: ☐ No: ☐ N/A: ☐

   If no, which services are exempted? Please state them

   ……..

Family health

10. a) Do you suffer from any of the following disease/s?

   i. Hypertension (High blood pressure): Yes ☐ No ☐

   ii. Diabetes Mellitus: Yes ☐ No ☐

   iii. Mental Illnesses: Yes ☐ No ☐

   iv. Heart Disease: Yes ☐ No ☐

   v. Polycystic Kidney Disease: Yes ☐ No ☐

   vi. Sickle Cell Disease: Yes ☐ No ☐

   vii. Leukaemia: Yes ☐ No ☐

   viii. Haemophilia Yes ☐ No ☐

   ix. Others: Name them ……

   ……

   b) If yes above, are you on medication? Yes ☐ No ☐

   c) If yes, do you take them as prescribed? Yes ☐ No ☐

   d) if not, why?

   ……

   ……

   ……

11. Does your spouse suffer from any of the above-mentioned diseases?
    Yes ☐ No ☐
12. If yes, which one(s)? Please name them.
    ……
    ……..
13. Does any member of your immediate family suffer from the following diseases?

Health condition	**Father**		**Mother**		**Sister**		**Brother**		**Others** ……	
	Yes	**No**	**Yes**	**No**	**Ye**	**No**	**Yes**	**No**	**Yes**	**No**
Hypertension (High blood pressure)										
Diabetes mellitus										
Mental illnesses										
Heart disease										
Polycystic kidney disease.										
sickle cell disease										
leukemia										
Any other ……..										

Obstetric data

14. a) How many pregnancies have you had?
    One (1) ☐ Two (2) ☐ Three(3) ☐ Four (4) ☐
    Others (indicate) ……
    b) Did you plan for any of the pregnancies? Yes ☐ No ☐
    c)If yes, which pregnancy? .....
15. Do you plan to have another baby? Yes: ☐ No: ☐
    If Not, why?
    i. Intended family size achieved. Yes: ☐ No: ☐

ii. Difficulties with the current pregnancy Yes: ☐ No: ☐

iii. Health challenges with Previous pregnancy/ies. Yes: ☐ No: ☐

iv. Medical health-related issues. Yes: ☐ No: ☐

v. Others. Name them. …….

Use of harmful substances

16. Have you ever smoked cigarettes? Yes: ☐ No: ☐

i)If yes, do you still smoke? Yes: ☐ No: ☐

Yes: ☐ No: ☐

ii)If no, when did you stop smoking? ……

……..

17. Have you ever taken alcohol?

Yes: ☐ No: ☐

i)If yes, do you still take alcohol? Yes: ☐ No: ☐

Yes: ☐ No: ☐

ii)If no, when did you stop? ……

……

18. Have you ever been a user of any other form of drug of addiction?

Yes: ☐ No: ☐

Please name it …….

i)If yes, are you still using the substance? Yes: ☐ No: ☐

ii)If no, when did you stop using? ……

……..

19. Does your spouse drink alcohol? Yes ☐ No ☐

20. Does your spouse smoke cigarettes? Yes ☐ No ☐

21. Does your spouse take any other type of addictive substances? Yes ☐ No ☐

Section 2: Knowledge on preconception care

22. Have you heard of Preconception care before? Yes: ☐ No: ☐

If yes, whom did you hear from?

i. Health care provider: ☐

ii. A friend: ☐

iii. Relative ☐`

iv. Reading materials: ☐

v. Media: ☐

vi. Others. Name them:……

23. Which of the following are components of preconception care?

i. Use of family Planning methods ☐ Yes: ☐ No: ☐

ii. Use of folic acid (blood boosters) before getting pregnant Yes: ☐ No: ☐

iii. Screening for infertility Yes: ☐ No: ☐

iv. Genetic testing or screening & counselling before getting pregnant. Yes:☐ No: ☐

v. Nutritional (dietary) counselling before getting pregnant. Yes: ☐ No: ☐

vi. Treatment and control of diseases like hypertension, diabetes, etc, before one becomes pregnant. Yes: ☐ No: ☐

vii. Assessment for complications from previous pregnancies before one conceives. Yes: ☐ No: ☐

viii. Testing and treatment for sexually transmitted infections including HIV, before getting pregnant. Yes: ☐ No: ☐

ix. Advise on stoppage of substance/alcohol and cigarette use before getting pregnant. Yes: ☐ No: ☐

x. Getting immunized against tetanus, hepatitis, rubella, etc., before getting pregnant

Yes: ☐ No: ☐

xi. Don't know ☐

xii. Others (name them) ……

24. Who should seek for preconception care services? Tick all that apply

i) Youths ☐

ii) Adolescents ☐

iii) Men ☐

iv) Married couples ☐

v) Those intending to get married ☐

vi) Women suffering from infertility ☐

vii) Those suffering from chronic diseases ☐

viii) Women who had pregnancy-related complications before ☐

ix) Don't know ☐

x) Any other: Please state ……

25. In your opinion, when should a woman of childbearing age seek preconception care (health assessment and care) services?

a) Before the first pregnancy ☐

b) Between pregnancies ☐

c) Don't know ☐

d) Any other (please indicate) …….

Section 3: Preconception care utilization

26. Have you ever received any of the following services before getting pregnant?

a) Family Planning Yes ☐ No ☐

b) Use of folic acid Yes ☐ No ☐

c) Vaccination against tetanus, hepatitis or rubella Yes ☐ No ☐

d) Genetic testing or screening or counselling Yes ☐ No ☐

e) Nutritional counselling Yes ☐ No ☐

f) Treatment of existing diseases Yes ☐ No ☐ N/A ☐

g) Change of the drugs or dosage of drugs that you use daily. Yes ☐ No ☐ N/A ☐

h) Screening for infertility Yes ☐ No ☐ N/A ☐

i) Assessment for complications from previous pregnancies. Yes ☐ No ☐

j) Advise to stop use of alcohol, cigarettes, or other addictive drugs. Yes ☐ No ☐ N/A ☐

27. Who offered you the above (34) preconception care services?

a. Nurse ☐

b. Clinical Officer ☐

c. Doctor ☐

d. Others. Specify ……

28. when did you receive the above (34) mentioned services?

i. Before my first pregnancy ☐

ii. In between pregnancies 1st & 2nd ☐ 2nd & 3rd ☐ 3rd & 4th ☐ Others …….

iii. Before marriage ☐

iv. After marriage ☐

29. if you have never received preconception care, what are the reasons?

i) I was not aware that such services existed ☐

ii) Lack of time ☐

iii) Lack of money to pay for the services ☐

iv) It was not a priority to me ☐

v) I didn't have any health problems ☐

vi) The pregnancy was not planned ☐

vii) Getting pregnant is a private affair, hence no need to discuss with anyone ☐

viii) It's not culturally right to discuss issues related to conception ☐

ix) Any other, please state: ……

30. Would you recommend preconception care to someone else? Yes: ☐ No: ☐

31. Why do you think some women of childbearing age don't seek for preconception care services in your community?

……

……

……

……

Section 4: Social cultural factors

32. Who makes reproductive health decisions in your family?

    i) Self ☐

    ii) My partner ☐

    iii) Both my partner and I ☐

    iv) Others. Name them ……

33. What support do you receive from your partner when seeking reproductive health services?

    i) Providing transport ☐

    ii) Accompanying you to the clinic ☐

    iii) Supporting your decision in seeking maternal health services ☐

    iv) Not applicable ☐

    v) Others. state them ……

    ……

    ……

34. Are there religious beliefs that prevent women of childbearing age from using preconception care? Yes: ☐ No: ☐

    If yes, which are they? ……

    ……

    ……..

35. Are there traditional beliefs that may affect the use of pre-conception care in the community you come from? Yes: ☐ No: ☐

    If yes, which are they?.....

    ……

    ……

36. Which of the following are common beliefs in your community that may discourage women of childbearing age and their partners from seeking preconception care services?

    a. Preconception care is a private affair ☐

b. It's not culturally right to disclose your intentions to conceive to anyone ☐

c. Community beliefs that you should not discuss reproductive health issues except with your partner ☐

d. It's a taboo to talk about an oncoming pregnancy ☐

e. Others (add) …….
……
……..

Section 5: Institutional factors associated with utilization of preconception care

37. Do you know whether preconception care services are available at Thika level 5 hospital? Yes ☐ No ☐

If yes, where can you get PCC services?

i) Family planning clinic ☐
ii) Maternal and child health clinic ☐
iii) General outpatient clinic ☐
iv) Maternity unit ☐
v) Gynaecologists' clinic ☐
vi) From any health practitioner ☐
vii) From any clinic within the hospital ☐
ix) Any other (please indicate):……

38. In your opinion, what are some of the factors that affect maximum use of preconception care in our hospitals?

i. Cost of reproductive health care services ☐
ii. Distance from health care facilities ☐
iii. Long queues in the hospital ☐
iv. Issues related to health care providers ☐ Please state them ……...…….
v. Unavailability of some services ☐
vi. Lack of privacy ☐
vii. None of the above ☐

vii. Others. Name them.

39. What do you think the government or Thika level 5 hospital can do to help increase the use of preconception care services by women of reproductive health?

_____

_____

_____

Appendix III: Key Informant Interview Guide

Date of interview: ……

Age in years: ……

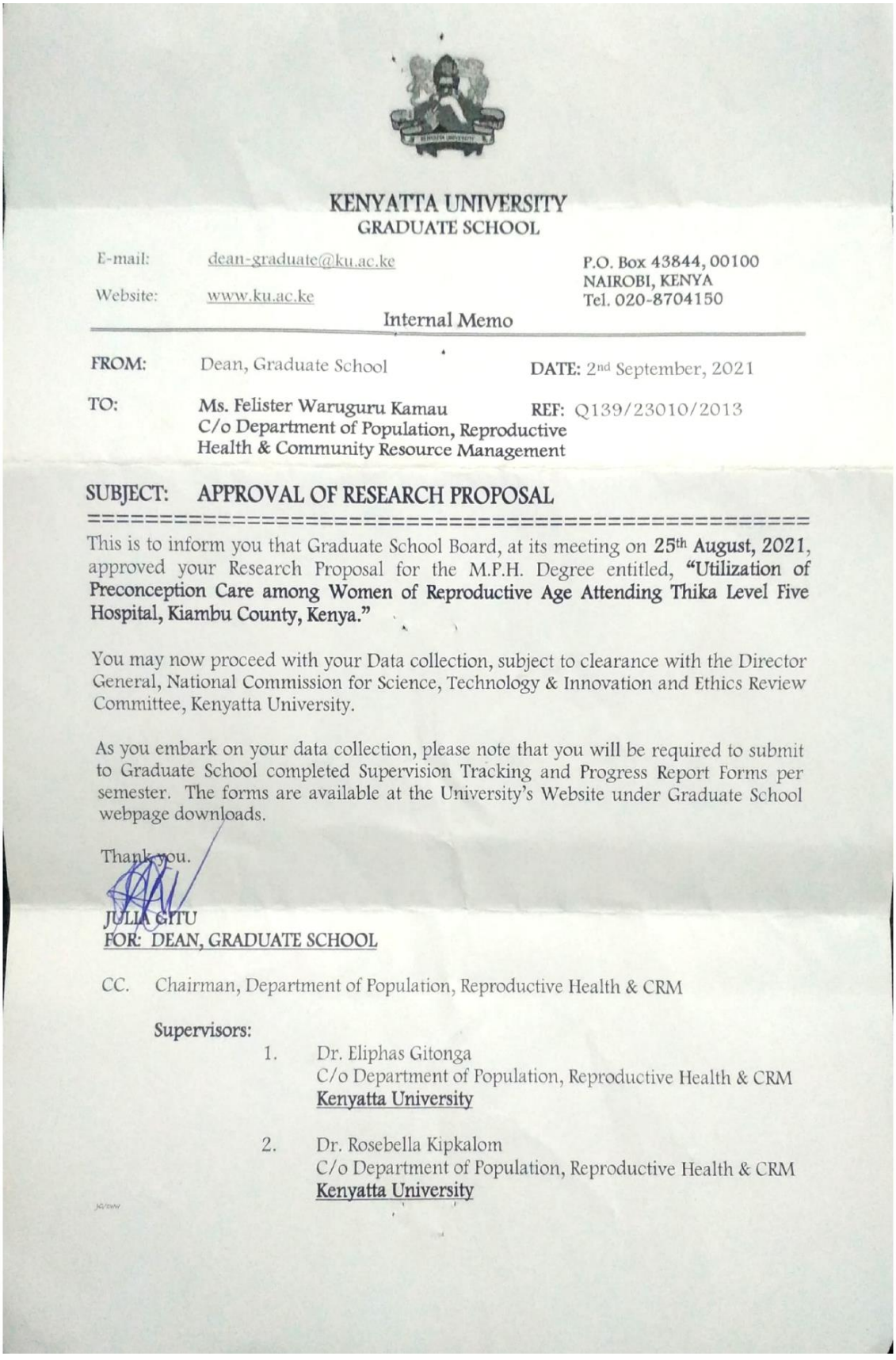
Sex: ……

Profession: ……

Years of service: ……...

1. What are some of the PCC services that are offered in Thika Level 5 hospital? *(Probe for who is responsible, services offered, service provision areas)*
2. As a health care provider, do you support the provision of PCC to women of reproductive age?
3. As a health care provider, do you feel well prepared to offer preconception care services? (*Probe for level of knowledge on PCC, timing, role of PCC*)
4. In your own opinion, what is the role of the health care provider in ensuring maximum provision of PCC services? (*Probe for required support, e.g. training, policy documents, guidelines; role of policy makers*)
5. In your opinion, what do you think are:
    a) Client-related barriers/challenges to maximum utilization of PCC services by women of reproductive age?
    b) Health care providers' barriers
    c) Health facility-related barriers
    d) Policy-related barriers
6. How can the barriers be addressed in order to enhance utilization of PCC?

Appendix IV: Graduate School Approval



KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Internal Memo

FROM: Dean, Graduate School DATE: 2nd September, 2021

TO: Ms. Felister Waruguru Kamau REF: Q139/23010/2013
C/o Department of Population, Reproductive Health & Community Resource Management

SUBJECT: APPROVAL OF RESEARCH PROPOSAL

This is to inform you that Graduate School Board, at its meeting on 25th August, 2021, approved your Research Proposal for the M.P.H. Degree entitled, **"Utilization of Preconception Care among Women of Reproductive Age Attending Thika Level Five Hospital, Kiambu County, Kenya."**

You may now proceed with your Data collection, subject to clearance with the Director General, National Commission for Science, Technology & Innovation and Ethics Review Committee, Kenyatta University.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking and Progress Report Forms per semester. The forms are available at the University's Website under Graduate School webpage downloads.

Thank you.

JULIA GITU
FOR: DEAN, GRADUATE SCHOOL

CC. Chairman, Department of Population, Reproductive Health & CRM

Supervisors:

1. Dr. Eliphas Gitonga
   C/o Department of Population, Reproductive Health & CRM
   Kenyatta University

2. Dr. Rosebella Kipkalom
   C/o Department of Population, Reproductive Health & CRM
   Kenyatta University

Appendix V: KUERC Approval

KENYATTA UNIVERSITY
CENTRE FOR RESEARCH ETHICS AND SAFETY

Fax: 8711242/8711575 **P. O. Box 43844,**
Email: chairman.kuerc@ku.ac.ke
Nairobi, 00100

Tel: 8710901/12

Website: www.ku.ac.ke
Our Ref: **KU/ERC/APPROVAL/VOL.1** Date: 2nd /03/2022

Felister W. Kamau
P.O Box 43844, 00100
Nairobi.

Dear Ms. Kamau,

APPLICATION NUMBER: PKU/2383/I1520 UTILIZATION OF PRE-CONCEPTION CARE AMONG WOMEN OF REPRODUCTIVE AGE ATTENDING THIKA LEVEL FIVE HOSPITAL, KIAMBU

This is to inform you that ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE*** has reviewed and approved your above research proposal. Your application approval number is **PKU/2383/I1520.** The approval period is **2nd /03/2022 to 2nd /03/2023**

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE***
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE*** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE*** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions.

vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.

vii. Submission of an executive summary report within 90 days upon completion of the study to ***KENYATTA UNIVERSITY ETHICS REVIEW COMMITTEE***

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://research-portal.nacosti.go.ke and also obtain other clearances needed.

To serve you better, researchers are kindly requested to access and complete a customer feedback form and sent it back online as you continue with research and upon completion of data collection found on the following website link; ;(https://docs.google.com/forms/d/1ytWefDwvyz5h1oz_VIn0xbxg3uGdlDzMXFWNDsMrRPQ/edit?usp=sharing

Yours sincerely

Prof. Judith Kimiywe

Director: Centre for Research Ethics and Safety

Appendix VI: Research License from NACOSTI

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **131003**

Date of Issue: **22/March/2022**

RESEARCH LICENSE

This is to Certify that Ms.. FELISTER WARUGURU KAMAU of Kenyatta University, has been licensed to conduct research in Kiambu on the topic: UTILIZATION OF PRECONCEPTION CARE AMONG WOMEN OF REPRODUCTIVE AGE ATTENDING THIKA LEVEL FIVE HOSPITAL, KIAMBU COUNTY, KENYA. for the period ending : 22/March/2023.

License No: **NACOSTI/P/22/16327**

131003

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

Appendix VII: Clearance from Kiambu County

COUNTY GOVERNMENT OF KIAMBU
DEPARTMENT OF HEALTH SERVICES

All correspondence should be addressed to HEAD
HRDU – HEALTH DEPARTMENT
Email address: mndiritu@gmail.com
mkwasa@live.com
Tel. Nos: 0721641516
0721974633

HEALTH RESEARCH AND DEVELOPMENT
UNIT
P. O. BOX 2344 – 00900
KIAMBU

Ref. No.: KIAMBU/HRDU/22/04/01/RA_WARUGURU Date: 1st Apr 2022

TO WHOM IT MAY CONCERN

RE: CLEARANCE TO CONDUCT RESEARCH IN KIAMBU COUNTY

Kindly note that we have received a request from Ms. Felister Waruguru of Kenyatta University to carry out her study in Kiambu County, the research topic being on **"Utilisation Of Preconception Care Among Women Of Reproductive Age Attending Thika Level 5hospital, Kiambu County, Kenya"**

We have duly inspected her documents and found that she has been cleared by NACOSTI to carry out the research for a period ending **27th March 2023**. She thus does not need any further clearance with another regulatory body in order to conduct research within the county of Kiambu.

However, it is incumbent upon the institution where she is carrying out research to ensure that she receives adequate supervision during the process of conducting the research. This note also accords her the duty to provide a feedback on her research to the county at the conclusion of her research.

DR. MWANCHA KWASA
COUNTY CLINICAL RESEARCH OFFICER
KIAMBU COUNTY

Appendix VIII: Permission From Thika Level 5 Hospital

COUNTY GOVERNMENT OF KIAMBU

DEPARTMENT OF HEALTH SERVICES

Telephone: +254722106797
Email address: thikal5hospital@gmail.com

When replying please quote:

Ref; MOH/TKA/GEN/VOL.V/591

THE MEDICAL
SUPERINTENDENT,
P. O. BOX 227 – 01000,
THIKA

Date: 20th April, 2022

APPROVAL TO CARRY OUT RESEARCH

PRINCIPLE INVESTIGATOR: FELISTER WARUGURU KAMAU

RE: UTILIZATION OF PRECONCEPTION AMONG WOMEN OF REPRODUCTIVE AGE AT THIKA LEVEL FIVE HOSPITAL IN KIAMBU COUNTY, KENYA

Following deliberations by Thika Level 5 Hospital's Training, Research and Ethics Committee (TREC), and subject to provision of all the necessary licenses and ethical approvals, your proposal to carry out the above referenced research, at this facility, has been approved.

This approval is subject to the following mandatory conditions:

1. You shall submit a copy of the abstract of the final report, through the above contact details.
2. Where called upon, you shall be expected to make a feedback presentation to the hospital's Training, Research and Ethics Committee.
3. You shall maintain ethical consideration and the research subjects' confidentiality as outlined in your proposal.
4. Any patient confidential information that you may access during your research should not be used without consent.
5. You shall make payments of applicable research fees to the hospital before commencing research activities.

This letter is valid up to October, 2022.

For any queries feel free to contact the committee chair through the Medical Superintendent's office or Training, Research and Ethics Committee Office.

Thank you and all the best.

Dr. Catherine Munyendo
Chairperson, Training Research & Ethics Committee,
THIKA LEVEL 5 HOSPITAL

Appendix IX: Code Book for Qualitative Data

Themes	Sub themes	Codes
Social cultural factors	Beliefs	Taboo, Unplanned pregnancies, Cultural beliefs, Religious beliefs, Trauma, People's perception Negative judgement
	Partner support	Male involvement
Institutional factors	PCC service provision	Availability of the services, Cost of care, Long queues, Referral system, Confidence in offering the services, Willingness to offer the services
	Human resource	Shortage of staff, Heavy workload, added responsibility, Prioritization for curative rather than preventive
	Infrastructure	Distance from the health facility, Standalone PCC clinics, Lack of structures in PCC provision, No elaborate clinic (room) for PCC Decentralization of RH services
HCP's knowledge	Basic knowledge Background training Learning materials Access to PCC information	Inadequate knowledge, Clinical placement (attachment during training), No formal training, Low content coverage during training, Lack of mentorship, On-the-job training, Inadequate curriculum content, Training on PCC, Perception on who should receive PCC services, PCC-specific policies & guidelines, timing of PCC, persons to use PCC
Health care providers practice	Mentorship Guidelines	Lack of competence, no previous experience, lack of structures in PCC service provision, and infrastructure

Appendix X: Map of the Study Area