KNOWLEDGE AND PRACTICE OF PRECONCEPTION CARE AMONG FINAL YEAR FEMALE UNDERGRADUATE STUDENTS OF FEDERAL UNIVERSITY OF TECHNOLOGY AKURE, ONDO STATE

BY

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DEDICATION

This research work is dedicated to the Almighty God who His infinite mercy brought me thus far. All glory and honour belongs to Him.

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ABSTRACT

Early inception of preconception care is essential for preventing maternal and neonatal morbidity and mortality. Preconception is the promotion of the health and wellbeing of a woman and her partner before pregnancy and improving health outcomes. Several studies in Nigeria assessing knowledge and practice of preconception care have focused mainly on adult women visiting antenatal care in the hospital. Hence, this study assessed the knowledge and practices of preconception care among final year female undergraduate students of Federal University of Technology Akure, (FUTA) Nigeria.

The study was descriptive cross-sectional survey; a three-stage sampling technique was used to select 422 final year female undergraduate students in FUTA. A pretested semi-structured self-administered questionnaire which contained 4-point knowledge scale, 10-point practice scale and questions relating to factors affecting the practice of preconception care was used for data collection. Knowledge scores 0-1 and 2-4 points were categorized among those with good knowledge, while respondents that had just 1s point or no point had poor knowledge. Practice was also scored as 10 point scale; scores of 0-5 indicated as poor practices while scores greater than 5 indicated as good practices of preconception care. Data were analyzed using descriptive statistics, Chi-square test and logistic regression, with level of significance set at 0.05.

The mean age of the respondents was 23.6±2.3 years. Most of the respondents (90.1%) were single and 71.9% of them lived outside the campus. (47%) of the respondents reported to be aware of preconception care and 5.7% had good knowledge of it. Less than half (31.0%) of the respondents had good practice of preconception care. Those who were currently planning to get married (68.8%) and willing to seek medical care (58.6%) had better knowledge of preconception care. Similarly, respondents that were married (56.5%), practicing Islamic religion (45.0%), having regular monthly period (32.2%), that knew their HIV status (35.4%), who have ever heard of preconception care (39.7%), currently planning to marry (68.8%), who ever felt the need to attend medical screening (35.6%) and are willing to seek medical assistant before pregnancy (35.6%) significantly had better preconception care practices. The perception of the need to attend medical screening prior to

conception (OR=2.5, 95% CI=1.5-4.2). Having knowledge of HIV status (OR=2.9, 95% CI=0.4-1.8) and being aware of preconception care (OR=3.2, 95% CI=1.5-6.8) served as the main predictors of good preconception care practices.

The study showed that knowledge and practice of preconception care was poor among the students. Advocating for policies that encourage preconception care practice and providing enabling environment for preconception care practice are recommended. In addition, efforts to establish health education counseling and intervention strategies that can facilitate preconceptions are also recommended.

Key words: Preconception care, female undergraduate students, knowledge, practice

World counts: 436

CERTIFICATION

I certify that this study was carried out by Olusola Omotola Awodire under at the Department of Health Promotion and Education, Faculty of Public Health College of Medicine, University of Ibadan

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ABBREVIATIONS/ACRONYMS

CDC	Centers for Disease and Control
FUTA	Federal University of Technology Akure
HCT	HIV Counseling and Testing
HIV	Human Immune- deficiency Virus
MNCH	Maternal and Neonate Child Health
PCC	Preconception Care
STIs	Sexual Transmitted Infections
PID	Pelvic Inflammatory Diseases
IEC	Information Education Communication

DEFINITION OF TERMS

Final year undergraduate students: registered students of the institution in the last academic year of their programmes/courses.

Preconception Care: includes any intervention to optimize a woman's health before pregnancy with the aim to improve Maternal, Newborn and Child Health outcomes.

CHAPTER ONE

Introduction

1.1 Background to the study

Preconception care includes any intervention to optimize a woman's health before pregnancy with the aim to improve Maternal, Newborn and Child Health (MNCH) outcomes (Singh, Sedgh and Hussain, 2011). Preconception care bridges the gap in the continuum of care, and addresses pre-pregnancy health risks and health problems that could have negative maternal and fetal consequences. It has potential to further reduce global maternal and child mortality and morbidity, especially in low-income countries where the highest burden of pregnancy-related deaths and disability occurs (Dean, Lassi, Imam and Bhutta, 2014).

Preconception care includes health education, screening, and interventions for women of reproductive age to reduce risk factors that may adversely affect their pregnancies. Because nearly half of all pregnancies are unintended (CDC2011) Preconception care should be part of routine care, even for women who are not actively seeking pregnancy. Maternal and child health outcomes such as maternal and infant mortality, preterm births, and low birth weight, are often used as indicators of the overall health status in a population (CDC2006).

In developing countries, pregnancy and delivery side effects are a major cause for the death or disability of women in reproductive age. While each year 515,000 women die because of maternal side effects, for each death 30 more women will suffer from infections or disabilities caused by pregnancy or delivery (UNICEF 2008). According to physicians, suitable counseling and medical examinations before pregnancy will reduce many side effects of pregnancy and delivery (Dunkey-Bent, Dunkey J. 2000).

In developing countries, the absence of preconception counseling coupled with sub-optimal ante-natal care services is a barrier to reducing the incidence of Neural Tube Defects (NTDs) (Adeleye AO and Dairo MD, 2010). There is an increasing realization that a gap exists in the continuum of care. A growing body of evidence is showing that

preconception care, (care before pregnancy), can increase the health and well-being of women and couples and improve subsequent pregnancy and child health outcomes (WHO, 2012).

According to Dean et al., 2013, preconception care is most needed in low and middle income countries (LMICs) of Sub-Saharan Africa and South Asia, where the overwhelming majority of maternal and child deaths continue to occur. The state of maternal and child health in LMIC is reflective of the underlying determinants of health in these contexts, such as poverty, lack of water and sanitation facilities, and food shortages. Weak education and health systems, as well as sociocultural norms that perpetuate gender inequality, mean that women are often not empowered to gain access to healthcare or make decisions about their own wellbeing.

The general public understands that a woman's health during pregnancy can impact the health of her unborn baby, but is less aware of the importance of good health for both men and women prior to conception. The concept of actively preparing for pregnancy prior to conception continues to be a challenge for many youth of reproductive age (Best Start Resource Centre, 2009).Preconception care includes smoking and alcohol cessation, folic acid supplementation, achievement of proper weight, review and updates of vaccinations, appropriate management and therapy of chronic diseases and intake of proper nutrition for all women to prevent neural tube defects and to reduce preterm birth and congenital heart defect (Frey KA, and Navario 2006).

Preconception decisions are important because steps taken only during pregnancy may not fully mitigate certain risk factors. At least three months before attempting to become pregnant women should take steps to help assure a healthy pregnancy and newborn. Preconception is a valuable way to review issues such as being up-to-date with immunizations, eating a healthy diet, taking folic acid, and avoiding alcoholic beverages. Behavioral changes such as quitting smoking or reaching a healthy weight should begin even earlier. Preconception care should be tailored to meet the needs of the individual woman. This care should be provided with attention relevant to each woman at her life stage and level of risk. Women with chronic diseases, previous pregnancy complications, or behavioral risk factors will need more intensive education, counseling and support

(CDC 2006).Preconception care has the potential to positively impact, 208 million pregnancies worldwide each year (Singh, Sedgh, Hussain 2011).

1.2 Statement of problem

Despite efforts to eliminate adverse birth outcomes, Nigeria accounts for about 13 percent of the global maternal death rates with an estimated 36,000 women dying in pregnancy or at child birth each year. At least 5500 of these deaths are among teenage mothers (National Center Health Statistics, 2007). Poor maternal health is documented as one of the major risk factors to preterm births, low birth weight, and infant mortality (Haas, Meneses, McCormick, 1999 and ConeWesson, 2005). Therefore, poor health among women of childbearing age, regardless of maternal status (e.g., pregnant, post-partum), is a problem. Some maternal health conditions provide little opportunity for amelioration or management within the pregnancy context (Haas et al., 2004). For example, women with poor physical functioning or chronic hypertension before conception were more likely to have preterm delivery (Haas, Fuentes-Afflick, Stewart, Jackson, Dean 2004). Therefore, these women face additional hurdles regarding their reproductive health as well as potential adverse pregnancy/childbirth outcomes. Some health conditions that influence maternal and reproductive health are more amenable to efforts to change or improve. These include health conditions and behaviors associated with adverse birth outcomes that are initiated or maintained by the individual (e.g., alcohol abuse, insufficient intake of folic acid). For example, binge drinking before and during pregnancy may result in Fetal Alcohol Syndrome in infants, causing physical deformities and cognitive deficits (Coles, 1994; CDC, 2005b). Insufficient intake of folic acid before pregnancy contributes to neural tube defects (Yang, Q.H, Carter, H.K2007). These types of behaviors are preventable, are open to intervention, and if ameliorated may lead to improved birth outcomes and improved health of women, regardless of maternal and pregnancy status.

Factors and behaviors that can influence health outcomes, including reproductive health, may start as early as conception. A Life Course Approach to understanding multi-factorial influences on health outcomes proposes that “Longterm effects of physical and social exposures during gestation, childhood, adolescence, young adulthood and later

adult life" accumulate over the lifespan (Ben-Shlomo&Kuh, 2002). Researchers utilizing the Life Course Approach consider that social, behavioral and environmental factors may have a stronger influence on reproductive outcomes than current behaviors or social status (Lu, 2003). The cumulative effects of poor nutritional status, life events and high-risk sexual behaviors can pose a serious threat to women's reproductive health. Given this premise, an early start to optimizing women's health is imperative to overall health and to pregnancy outcomes.

1.3 Justification

Preconception health of women of reproductive age (between the ages of 15 and 44 years) can affect their ability to become pregnant, their health during pregnancy, pregnancy outcome, and their health as a parent. Many women are entering pregnancy with risk factors that affect their health as well as health of their infants. Practicing preconception care is guidance on the risks arising from the use of legal drugs that can lead to fetal malformation. In addition, the use of illicit drugs is also contraindicated during pregnancy, because it can cause fetal malformation, abortion, infectious diseases, maternal and fetal malnutrition, low birth weight, intrauterine growth restriction, preterm delivery, and neonatal drug withdrawal syndrome. This study therefore investigated the knowledge and practices of preconception care among the female final year students it will help most of the women to take preconception measure before they will plan to conceive and it will help the adolescents to plan their pregnancy so as to prevent unwanted pregnancy and unplanned pregnancy it will also help to prevent maternal and infant mortality, preterm births, and low birth weight. PCC can help women's health, violence against girls and women, unsafe abortions, and harmful environmental exposures that require further substantiation of magnitude of pre-pregnancy risk, and proof that prevention and management as part of preconception care will have greater impact than prenatal care alone.

1.4 Research question

1. What is the level of awareness of preconception care among the final year female undergraduate students in FUTA, Akure?

2. What is the level of knowledge of preconception care among final year female undergraduate students?

3. What are the preconception care practices among the final year female undergraduate students?

4. What are the factors influencing preconception care practices among final year female undergraduate students?

1.5 Broad objective

The broad objective of this research was to assess the knowledge and practices of preconception care among final year female undergraduate students of Federal University of Technology, Akure (FUTA) Nigeria.

1.6 Specific objectives

The specific objectives of this research were to:

1. Assess the level of awareness of preconception care among final year female undergraduate student.

2. Assess the level of knowledge of preconception care among final year female undergraduate student

3. Determine the preconception care practices among final year female undergraduate students

4. Identify factors influencing of preconception care practices among final year female undergraduate student.

1.7 Hypotheses

1. There is no significant relationship between socio-demographic characteristics and knowledge of preconception care.

2. There is no significant relationship between socio-demographics and preconception care practices of respondents.

3. There is no significant relationship between knowledge and preconception care practices of respondents.

4. There is no significant relationship between factors that are against preconception care and knowledge of preconception care among respondents.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual Review

Preconception care is the provision of biomedical, behavioral and social interventions to women and couples before conception occurs to address health problems, behaviours that could lead to health problems and individual or environmental risk factors that could contribute to maternal or childhood mortality and morbidity. Its ultimate aim is improved maternal and child health outcomes (Imam 2014). Preconception care covers the period before a first pregnancy occurs, and between two pregnancies. Preconception care (PCC) is the promotion of the health and well-being of a woman and her partner before pregnancy, it is considered as the primary preventive approach for couples planning for conception; it can identify and modify behavioral, medical, environmental factors and other health risk factors known to impact pregnancy outcomes through prevention and management (Chuaung and Chen, 2008).

2.1.1. Preconception care

Preconception care is a new strategy to improve the health of future children and their mothers and to a lesser extent the prospective fathers' health through primary intervention (Health council of Netherlands, 2007). The world has made significant improvement in saving the lives of mothers and children since Millennium Development Goals 4 and 5 were adopted by world leaders in 2000. Yet with existing effective interventions and public health commitment greater than ever before, there are still 287,000 maternal and 2.9 million newborn deaths each year, with an additional 2.6 million stillbirths (UNICEF 2013). Further, there are growing problems such as obesity and other chronic health problems with their attendant maternal and fetal risks (WHO and UNICEF 2012). A significant proportion of newborn deaths are due to prematurity, which may result from a number of factors (WHO 2012). Most disconcertingly, 90% or more of maternal and child mortality remains concentrated in South Asia and Sub-Saharan Africa, countries that simply lack the resources to deliver existing, effective interventions that could prevent many of these deaths (Iman 2010). Moving towards

preconception care offers the potential for earlier risk assessment and intervention that can benefit the woman or couple even before pregnancy and ensure the healthiest possible start for the newborn child.

Singh and Sedgh 2010 reported that, women's health, violence against girls and women, unsafe abortions, alcohol and tobacco use, and harmful environmental exposures require further substantiation of magnitude of pre-pregnancy risk, and proof that prevention and management as part of preconception care will have greater impact than prenatal care alone. The period before conception is increasingly regarded as important for the health of pregnant women and future generations. Successive reports from the Centre for Maternal and Child Enquiries (Stephenson et al., 2014) conclude that lack of preconception care is a contributory factor in maternal deaths, while evidence from life course epidemiology (Hansan, 2009) and (Patel 2014) and epigenetics highlights the importance of the intrauterine environment in determining chronic disease risk in childhood and adulthood (Gluckmam, 2009). Maternal diet and nutritional status, which can be modified before conception, have an important influence on the intrauterine environment and fetal development. Consequently, the preconception period is seen as a critical period where intervention can lead to both short term benefit, by reducing pregnancy complications and adverse birth outcomes, and long term health gain, as emphasized in the WHO Global Action Plan for the Prevention and Control of Non-communicable Diseases 2013–2020.

2.1.2 Components of preconception care

Component of preconception care is to impart relevant information to prospective parents, thereby improving knowledge. And to modify individual behavior based on the knowledge gained (Wallace 1998). Preconception care anticipates on these three components and entails, Risk assessment, Health promotion, Counseling and interventions.

Risk assessment is the systematic identification and evaluation of risk factors for so called adverse 'pregnancy outcomes'. Risk factors vary widely and include not taking

folic acid supplements, using medication that can cause malformations or functional damage to an embryo, overweight, smoking, diabetes or having an inheritable disease.

Health promotion means informing and educating couples on how to improve their health in order to improve the future child's health, including avoiding alcohol and tobacco, and the importance of proper nutrition and exercise.

Prospective parents are counseled about additional screening, diagnostic tests, and specialist consultations that may be necessary if risks are identified. Intervention refers to efforts to modify or eliminate risk factors. (Steegers 2005)

2.1.3 Goals and beneficiaries of preconception care

Preconception care aims to improve the health of future children and their mothers and to a lesser extent the prospective fathers' health. Furthermore, it aims to improve couples' informed decision making by providing information on reproductive options. It aims as well at improvements and cost savings at the public health level.

Three beneficiaries of preconception care can be distinguished

The primary beneficiary of preconception care is the child, as it optimizes the conditions for intrauterine growth and development. In general, antenatal care starts after the 12th week of pregnancy, neglecting the first gestational weeks, during which key embryonic growth and development take place and may be associated with adverse effects on the child's health. (Mook- Kanamori 2010). To improve prospective parents' knowledge of these first weeks being crucial for the child's health, it is important that prospective parents are informed about potential risks before pregnancy. PCC therefore may be a good way to assure appropriate actions to avoid risks in early pregnancy. Preconception care can be seen as a window of opportunity to women's health, as through preconception care the woman may optimally prepare her body for a pregnancy. In addition, the changes induced by preconception care are also usually beneficial to the prospective parents' health. Furthermore, preconception care may increase awareness of possible health risks, contributing to a healthy lifestyle, also later in life (Kerber, 2007).

Also, receiving information through preconception care consultation increases the prospective parents' options in the process of becoming pregnant, as it enables them to make informed choices they will be informed if they choose to be informed; they can choose whether or not to live according to the lifestyle advice given and in case of a severe inheritable disease, they may choose not to intervene at all, choose for medically assisted conception in combination with embryo selection, choose to forego parenthood, or they may choose to adopt a child.

Another benefit of preconception care is the improvement of public health, which is a result of the improvement of the individual's (prospective parents' and future children's) health. Furthermore, preconception care serves as an opportunity to screen for current and future health threats like malnutrition and obesity. As a public health strategy, preconception care may be a rewarding and cost effective preventive strategy (De Weerd,2004)

Preconception Care is considered as a step towards saving the society and allowing people to enjoy life (Stanley et al., 2001). In Egypt, the first checkup center has been operating since mid-2001. Despite the success of this center in control of many health problems, attendants' number is still few. It seems that many young couples remain skeptical about the usefulness of PCC and less likely to convince (Khater and Ghazaly, 2003). On the other hand according to WHO (2000a), Nowadays, PCC became compulsory by law in many Arab countries including Egypt (UNFPA, 2010). According to Beamish (2003), young people need more information on reproductive health and access to services before they have their first child. Although premarital care should be an essential part of primary and preventive care, rather than an isolated visit (Moos, 2004), a large number of health providers in primary care and maternal and child health services require basic training in PCC (WHO, 2000). The reproductive health service is lagging behind current attitudes and demands of university students. Although students' attitudes towards sexual matters are liberal, their knowledge about reproductive health and premarital knowledge is still limited (Chen et al., 2008).

Preconception care is an ongoing component of the provision of health services to reproductive-aged men and women and should be tailored to meet the needs of the

individual. The goal is to ensure that women and men are healthy, avoid hazardous exposures, are able to plan for a pregnancy, and optimize the potential for a healthy pregnancy and baby in any potential future pregnancies. For women and men who do not intend to conceive, preconception care is about maximizing their health and ensuring their ability to succeed in avoiding pregnancy. Preconception care is an effort to provide a unified and integrated approach to women of reproductive age that is not founded on a dichotomous perspective of this group of women as pregnant versus non-pregnant. The foundation of adequate preconception care is knowing what the woman's reproductive life plan is at a given point in time and helping her achieve this plan.

Preconception health strategies include aspects related to awareness, knowledge, skills, motivation, opportunity, access, supportive environments, policy development, and ultimately, behavior change (Alberta Perinatal Health Program, 2007). Pregnancy outcomes are influenced by preconception health, lifestyle and personal history (Haas, Berman, Goldberg, Lee, and Cook, 1996). In fact, by the time many women know they are pregnant; it may be too late to prevent some birth defects, for example Neural Tube Defects (NTDs). However, research has shown that fewer than 60% of family physicians and obstetricians in Canada discussed the use of folic acid supplementation prior to conception to prevent Neural Tube Defects (NTDs) (Tough, Clarke, Hicks, and Cook, 2006). Substance use (alcohol, tobacco, drugs) prior to conception is also associated with poor perinatal outcomes, however, fewer than 50% of health care providers in Canada discussed smoking, alcohol use or addiction history with women of childbearing age (Tough et al., 2006).

2.1.4 Importance of preconception care on nutrition

Nutritional status is an important aspect of health and wellness before and during pregnancy. Under nutrition in women contributes to 20% of maternal deaths, and is a significant risk factor for stillbirths, preterm births, small for gestational age and low birth weight babies (Sebire, 2011), yet in most countries 10-20% of women are underweight (Black, Allen 2008). Maternal short stature heightens the risk for obstructed labor, obstetric fistula and maternal mortality, as well as birth asphyxia leading to

neonatal death, and is often the result of girls being stunted since childhood (Bhutta, 2002).

Pre-pregnancy overweight and obesity has been linked to two of the foremost causes of maternal mortality (Doherty 2006), hypertensive disorders of pregnancy (Bodnar, 2007) and Gestational Diabetes mellitus (GDM) (Chu 2007) as well as an entire spectrum of adverse pregnancy outcomes, including poor lactation practices (Hilson, Rasmussen, 2004), obstetric anesthesia-related complications (Saravakumar, 2006), prolonged gestation (Stoland, 2007), maternal infectious morbidity (Myles, 2002) and decreased success with trial of labor (Goodall, 2005). Maternal obesity is a cause for stillbirths, fetal and neonatal death and moreover, perpetuates the obesity epidemic since children of obese women are more likely to be obese themselves (Kitsants, 2010).

Other micronutrients such as zinc and calcium have been found to improve maternal and newborn outcomes when supplementation is provided during pregnancy, it seems likely that ensuring adequate intake of these micronutrients earlier, which is during the preconception period, would be of added benefit for undernourished girls and women and in the case of unplanned pregnancies. Folic acid, B vitamins and zinc have been shown to affect early fetal development, even before women realize they are pregnant. Micronutrient supplementation or fortification is currently being used as strategies to improve nutrition even in resource-poor settings since many girls and women are chronically undernourished (Ramakrishnan, 2012). Maternal nutrition before conception (preconception nutrition) is increasingly being investigated to ascertain if nutrition affects the health of infant and whether it has lifelong effects into adulthood (Mahan et al, 2012.). The Nutrient status of women depends largely on their own nutrient stores and dietary intakes which determines the availability and supply of nutrients to the developing fetus. It is rather unfortunate that, many pregnancies are discovered after critical developmental processes such as organogenesis have already commenced and completed, as a result, the first antennal visit becomes rather too late to address perinatal risk factors (Johnson et al., 2006).

2.1.5 Knowledge of preconception care among the general population

Promote Healthy Nutrition

Supplementation/fortification of essential foods with micronutrients Studies of the biological mechanisms leading to preterm birth indicate that more severe congenital disorders, including neural tube defects, might result in preterm delivery (Honein et al., 2009). Consuming a multivitamin containing 400 µg of folic acid in the preconception period is the best way to ensure adequate micronutrient intake to help prevent Neural Tube and other Birth Defects (Christianson et al., 2006). Multivitamin supplementation reduces the risk of congenital malformations (e.g., neural tube, congenital heart and urinary tract and limb defects).

Dietary Intake Prior To Conception

The quality of a woman's diet before pregnancy has an influence on positive fetal and maternal outcomes. Therefore a healthy, balanced diet is important before as well as during pregnancy. Many women of child bearing age in the do not maintain a healthy diet prior to pregnancy. Not all women have financial or logistical access to a high quality diet. Furthermore several studies have shown that most women of reproductive age are not getting enough vitamins A, C, B6 and E, Folic acid, calcium, Iron, Zinc and Magnesium in their diet. This underscores the importance of encouraging healthy eating behaviors early in a woman's child bearing years improving dietary habits requires long term effort.

Preconception and antioxidants/micronutrients status in the prevention of adverse feto-maternal outcome

Animal and Epidemiologic studies reveals that dietary intake and supplementation of antioxidants such as vitamin C may play a beneficial role in the prevention of miscarriage and pre-eclampsia (Ferre, 2006). It was also shown that adequate multivitamin use in preconception period was associated with reduction in the risk of pre-eclampsia (Bodnar et al, 2006). Furthermore, suboptimal preconception vitamin B status was linked to spontaneous abortion /miscarriage and decreases probability of conception

(Ronnenberget al, 2007.). Neural Tube Defects (NTD), an important cause of morbidity and mortality in infants is shown to be prevented or reduced by optimal maternal foliate status or folic acid food fortification during preconception period (Persad et al, 2002). Though antioxidant prevents the damaging effects of reactive oxygen species (ROS), reports from control trials have failed to find beneficial effect of vitamin C supplementation in preventing pre-eclampsia (Agarwal et al, 2012).

2.1.6 The role of specific micronutrient

In the specific case of folic acid, the crucial importance of preconception intake by reproductive-age women is hard to overstate. A well-established body of research supports supplementation to reduce the incidence of neural tube defects that may occur very early in development, before many women are aware of a pregnancy. However, it is estimated that only a minority of reproductive-age women take a regular folic acid supplement. This may be particularly true of women who are actively avoiding pregnancy and using regular contraception. Patients need to be educated that, as effective as current contraceptive methods are known to be, each method has a typical user failure rate, meaning that actual effectiveness is lower than theoretical effectiveness.

Folic acid

Folic acid, a water-soluble B-complex vitamin required for deoxyribonucleic acid synthesis and cell division, is a nutrient currently recognized as important prior to and during pregnancy because of its proven preventive properties against neural tube defects (NTDs) (Pitkin, 2007). Neural tube defects are serious birth defects of the spine (Spina bifida) and brain (anencephaly). NTDs affect approximately 3000 pregnancies each year in the United States and are the second most common major congenital anomaly worldwide(US. 2005). Populations at increased risk for NTDs or folic acid deficiency include Hispanic women, obese women, diabetic women with poor glycemic control, women with prior NTDs, and women with seizure disorder taking antiepileptic medications. Wilson, et al,.(2007) reported that foliate levels can be increased by consuming foliate-rich food so ingesting folic acid, a synthetic compound available through dietary supplements and through fortified foods. The major dietary sources of

naturally occurring foliate are legumes, green leafy vegetables, citrus fruits and juices, and breads and cereals that contained folic enriched flour. Folic acid is approximately 1.7 times more bioavailable than foliate and therefore has a greater efficiency in impacting foliate levels (Neuhouser, Beresford 2001). Supplementing dietary intake with folic acid has been recommended by many professional organizations because of the difficulty for woman to obtain the extra foliate required periconceptionally through the diet alone. The current recommended daily intake (RDI) for folic acid is 400g for women of reproductive age and 600g during pregnancy (Institute of Medicine Food and Nutrition Board 1998) (IMFNB). The recommended dose is higher (4000g) for women who have had an infant with an NTD (Czeizel, 1995). Numerous studies have reported that women in the United States do not consume the recommended 400g of folic acid (Hilton, 2007). Furthermore, inadequate foliate levels have been linked to increased risks of stroke, cancer, and dementia (Wang et al., 2007).

Vitamin A

Vitamin A plays an important role in healthy fetal development and is required for growth and tissue maintenance of the fetus. It also plays a role in lung and eye development and immune function. (Van den Broek et al 2003), Vitamin A deficiency in the third trimester is associated with preterm delivery and maternal anemia (Radhika et al., 2002).Vitamin A supplementation with beta-carotene instead of retinol is recommended (Expert Group of vitamins and minerals 2003). However, supplements containing the recommended amounts of folic acid, Vitamin B12, iron and Vitamin A as well as beta carotene are not readily available (Dietitians of Canada 2008).

Vitamin D

Vitamin D is needed for bone growth and skeletal development and is required for calcium absorption (Best Start Resources Centers 2001). Research has also shown that Vitamin D may provide a protective effect in preventing mother-to-child transmission of Type 1 diabetes (Fronczak et al., 2003).

Iron

Although iron is more important in the latter part of pregnancy, many women are iron deficient at the time of conception (British Colombia Health Officers 2006). Iron is needed for the development of blood supplies and is stored by the infant for use after birth. Large stores of iron are necessary at birth to prevent the development of psychomotor impairments (British Colombian Health Officers 2006). (CDC 2006) repotted that Iron deficiency anemia during the first two trimesters is associated with a twofold increased risk for preterm birth and a threefold increased risk of delivering a low birth weight baby. Maternal iron anemia has been linked to impaired resistance to infection, fatigue and poor tolerance to blood loss and therefore to a poor tolerance during surgical interventions. Severe maternal anemia affects the brain development of the baby, acting as a human teratogen. Severe maternal anemia is also linked to neonatal anemia (Koren, 2008).

Calcium

Calcium is critical for skeletal mineralization and growth. During pregnancy large amounts of calcium are transferred from the mother to the fetus. If calcium in the mother's diet is inadequate, the fetus will leach what it needs from the mother's bones, leading to possible maternal health problems (Heringhausen, 2005).

2.1.7 Importance of Preconception Care for Women with Chronic Health Conditions

Chronic and non-communicable diseases are the largest cause of death in the world and as such have a well-established global epidemiological and economic impact. In addition, the prevalence of the most common chronic diseases is growing, particularly in developing countries, and is projected to continue to increase (Yach, Hawkes 2004). This has led to calls for key stakeholders, including public health researchers, to direct more research towards chronic disease and its impact. In line with this, the clinical impact of preconception care for women with chronic health conditions has received focused attention from researchers. Diabetes has received particular attention because the preconception health of women with either type 1 or type 2diabetes has been found to

impact on the risk of congenital malformations, preterm delivery and perinatal mortality of their offspring (Wahabi, Bawazeer,2010). Pre- pregnancy maternal obesity is linked to an increased likelihood of preterm birth and low birth weight (MicDonald 2010) as is hypertension (Harvelle EW 2011), depression and autoimmune disease (Castiglioni 2012).

2.1.8 Practices of preconception care

Prevent Unintended Pregnancies and Promote Optimal Birth Spacing

One way to ensure that mothers and babies have good outcomes is to encourage pregnancy planning. Women who have very closely spaced pregnancies (within 6 months of a previous live birth or pregnancy) are more likely to have preterm or low-birth weight babies (Conde-Agudelo et al., 2006). This may be because they have not had enough time to replenish their nutritional reserves or treat an infection or other systemic illness. The correct, consistent use of family planning methods leads to more women spacing their pregnancies 18 to 24 months apart, which is ideal (Tsui et al., 2010). Encouraging family planning and the use of contraceptive methods (hormonal and barrier methods) has other advantages including reductions in maternal and infant mortality, lower rates of unintended pregnancies, and prevention of STIs, including HIV (Conde-Agudelo et al., 2006; Tsui et al., 2010).

Enhance Pre-pregnancy Weight

Optimizing weight before pregnancy is recommended, since weight gain or loss during pregnancy increases the risk of adverse pregnancy outcomes. Monitoring nutritional status through measurement of women's body mass index prior to pregnancy is feasible, even in low-income contexts, and should be used as a baseline to develop a regimen for healthy eating and physical activity to optimize their weight. Women who are underweight before pregnancy (body mass index less than 18.5 kg/m2) are at significantly greater risk of having premature, low birth weight newborns (Han et al., 2011).

In order to define the categories of weight that are not normal, the World Health Organization and the National Institutes of Health grouped weight into four categories according to individuals' body mass index: underweight (<18.5 kg/m2), normal (18.5–24.9 kg/m2), overweight (25.0-29.9 kg/m2), and obese (30.0 kg/m2) (WHO, 2002). The literature shows a BMI-dependent relationship between pre-pregnancy obesity and adverse pregnancy outcomes (Raatikianen, 2006, Villamor, 2006). Excessive postpartum weight retention is a risk not only for subsequent pregnancies, but also for the development of maternal chronic diseases (Hoff, 2009, Joseph, 2008).

Preconception Care and Treating Infections

Infections can impact the reproductive health of women and hence may influence pregnancy related outcomes for both the mother and the child. These infections range from sexually transmitted infections (STIs) to TORCH infections to periodontal disease and may be transmitted to the fetus during pregnancy, labor, delivery or breastfeeding. STIs are a serious universal reproductive health concern with the weight of the disease falling excessively on women, especially those who are young or socio-economically disadvantaged. The World Health Organization estimates of syphilis infection among pregnant women stands at 2 million. (Schmid, Stoner 2007) reported that Congenital syphilis can have devastating complications including stillbirth, premature birth, neonatal death, developmental delay, blindness, deafness and seizures. Similarly, gonorrhea during pregnancy is associated with chorioamnionitis, premature rupture of membranes, preterm labor and can potentially cause severe conjunctivitis in the newborn. Chlamydia too in the pregnant woman can have serious consequences for her neonate, including conjunctivitis and pneumonia. With timely detection and treatments prior to conception, thereby helping the mother-to-be to achieve an optimal state of health earlier, these maternal and fetal complications can be averted. Initially, HIV/AIDS largely infected high risk populations, such as commercial sex workers and injecting drug users. Currently, however, the demographic with the highest incidence rate is women of reproductive age (Joint United Nation Programme 2008).

UNAIDS 2010 reported that Women are at particular risk of being infected in stable heterosexual relationships, since they often lack the skills to negotiate safe sexual

behaviors. Approximately 15.9 million women who are HIV positive today could potentially transmit the virus to their future children. Babies born with HIV are more likely to develop AIDS sooner and have more serious complications. Additionally, HIV-positive women are more likely to terminate their pregnancies, give birth to low birth weight (LBW) babies, deliver preterm, or experience stillbirths (Martins, Boyer 1997).Perinatal HIV transmission still accounts for ≥90% of the cases of pediatric acquired immunodeficiency syndrome in the United States (US) (CDC 1998). Although 18-40% of women in the US become pregnant after an HIV diagnosis (Stephenson et, al 1996) forty percent of these infants are born to mothers who are unaware of their HIV status. Therefore, in addition to timely preconception screening, these women require close monitoring of the disease status and treatment protocol as the state of pregnancy does not make the disease worse and women with HIV can have healthy pregnancies. However, women with low CD4 counts or active infections may have more complications. Also, while highly active antiretroviral therapy is contraindicated in the first trimester, treatment with anti-retroviral therapy (ART) has drastically decreased the mother to child transmission in the past few decades. Detection and treatment of STIs is inadequate without reducing risky behaviors (multiple partners, unprotected intercourse).

TORCH is another set of infections with serious neonatal complications, with congenital cytomegalovirus being the leading cause of hearing loss in children. The neonatal complications are more severe if acquired during early pregnancy and this necessitates early screening before the critical period of fetal organogenesis. Immunization against those infections that are vaccine-preventable would have greater benefit if they were also targeted to young women of reproductive age. The incidence of STIs remains very high in low- and middle- income countries (LMICs) being highest in urban men and women in their second to fourth decade of life when sexual activity is highest (Overm, Piot, 1993). Adolescents continue to be at high risk for acquiring an STI owing to a greater likelihood than adults of having multiple sexual partners, engaging in unprotected intercourse, selecting high-risk partners and older partners (Ikimalo, et al 1999).

2.1.9 Risk Factors Influencing Preconception Health

Several preconception risk factors and behaviors that affect fetal development and can lead to death. The Center for Disease Control and Prevention (CDC) identifies the key risk factors around which preconception interventions could be focused.

Table 2.1: Factors affecting Preconception Care:

1	Folic acids fortified multivitamin supplementation	Alcohol misuse	Diabetes
2	HIV/ AIDS testing	Tobacco	Obesity
3	Rubella immunization	Accutane	Sexually transmitted infections (STIs)
4	Hepatitis B immunization	Anti- epileptic drugs (certain cases require the use of these drugs in pregnancy	Maternal phenylketonuria
5	Health promotion against domestic and interpersonal violence	Oral anticoagulants	Hypertension

Table 2:2: Additional risk factors that may adversely influences pregnancy outcomes

S/N	Factors affecting Pregnancy Outcomes	Modifiable Risk Factors
1	Oral health	Micronutrient deficiencies
2	Eating disorders	Poverty
3	Domestic violence	Substance use disorders
4	Poor nutrition	Awareness of genetic history
5	Repeated pregnancy loss	Environmental hazards

Micronutrient Deficiencies

The association between vitamin and mineral deficiencies and the increased likelihood of maternal and infant morbidity and mortality has been well established. Micronutrients, including vitamins, are essential to healthy growth and development. Research consistently shows that even moderate levels of micronutrient deficiency may continue to negatively impact maternal and infant mortality. Micronutrient deficiency is associated with an increased likelihood of birth defects and intellectual impairment of infants, and may compromise the immune system of the mother (UNICEF and the Micronutrient initiation 2004). Adequate levels of micronutrients during pregnancy have been shown to reduce the incidence of low birth weight among babies (Osrin, et al 2005).

Neural tube defects (NTDs) highlight the importance of early intervention as they occur around 25 to 27 days following conception, and are highly preventable (McGeary, 2007). The prevention of NTDs due to folic acid is well documented. Available evidence shows that 0.4mg daily of folic acid reduces the number of NTD cases by 60% to 70% (McGeary, 2007). Evidence has also shown that folic acid provides a protective effect in the prevention of pediatric cancers. (Olshanet al 2002) currently, it is recommended that all women of childbearing age take a multivitamin daily containing 0.4mg of folic acid (British Columbia Health Officer 2006).

The Public Health Agency of Canada noted that women who could become pregnant, as many as 67% were not taking folic acid.(Public Health Agency of Canada), Education around the use of folic acid before pregnancy is essential as many women are unaware of the need for supplementation and more than half of all pregnancies are unplanned (Wald NJ, 2004). Relying on dietary intake alone to achieve adequate foliate level is unrealistic and presents a significant challenge especially for low income women. Folic acid supplementation prior to and at the beginning of pregnancy is essential. Evidence now suggests that multivitamin supplementation, along with higher levels of folic acid, among certain groups of women may not only prevent NTDs but also provide protection against a number of congenital anomalies.

Poverty

The rates of adverse pregnancy outcomes rise with increased socio-economic disadvantage. Access to care, environmental exposures and health behaviors are three major determinants of health that are influenced by low socioeconomic status (Heringhausen J, 2005). Income is cited as a significant predictor of foliate intake. Food security and access to nutritious food play an essential role in determining the ability to ensure a healthy maternal diet before and during pregnancy and reduce the risks for infants born to low income women (Killps et al., 2007). Access to programs that combine nutritional information with access to healthy, affordable foods, and dietary supplements is essential.

Substance Use Disorders

Alcohol is the most widely used teratogen among women of childbearing years and is a leading cause of neurobehavioral damage in children. Alcohol use in pregnancy is associated with increased rates of miscarriage, stillbirths, malformations, growth deficiencies, and central nervous system dysfunction (Best Start Resources Center 2005). Both illicit and prescription drug use can be potentially harmful to the developing fetus (CMHA 2007). Some adverse outcomes associated with certain drugs include an increased risk of preterm birth, small for gestational age, congenital anomalies, stillbirth, miscarriage, increased hospital stays and neonatal death (Kennare R Heard A, 2005).

Environmental factors such as child neglect, poor nutrition and unsafe housing are additional risk factors associated with drug use that have the potential to create unsafe environments for infants (CMHA 2007).

Awareness of Genetic History

As some risks for disease can be determined before birth, genetic counseling and a family genetic history can be an important aspect of preconception care. Knowledge of genetic risks can help couples to prepare and make decisions regarding their pregnancies, collect information and receive appropriate counseling prior to the birth (Best Start Resources Centre 2001). The advanced identification of a genetic disorder also provides the opportunity to prepare for potential medical complications during pregnancy and delivery and may also influence the location a woman may choose to deliver (Summers et al., 2007). Genetic counseling provides a means of dealing with the issues and challenges associated with the occurrence or risk of occurrence of a genetic condition. The process of genetic counseling involves helping the family/ individual to comprehend medical facts, understand the alternatives for dealing with risk, choose a course of action consistent with the family's goals, ethics, and religious beliefs, and make the best possible adjustment to the condition (Baker et al., 1998).

2.2 Theoretical Framework

The conceptual framework to be used in this study is the Health belief Model (HBM)

The model propose that people beliefs about whether or not they were susceptible to nutritional deficiency and some birth defect that can easily affect the unborn babies, and their perceptions of the benefits of trying to neglect it, influenced their readiness to act. Factors that affect young women of child bearing age in taking multivitamin supplement and intake of binge drink and smoking behavior can be identified and explained using the Health Belief Model**.**

The Health Belief Model (HBM) was developed in the 1950s by a group of social psychologists in the United States Public Health Service (Rosenstock 1974). The model attempts to explain and predict an individual's given health related behavior from their beliefs about the behavior and the health problems that the behavior was intended to prevent or control using a value expectancy approach (Glanz et al. 1997). It assumes that behavior depends upon the expected outcomes of an action and the value an individual places on those outcomes. The HBM suggests that the following factors explain and predict a health-related behavior: perceived susceptibility, perceived severity, perceived barriers, perceived benefits, self- efficacy and cues to action. The way a person relates themselves to each of these areas is predictive of how likely they are to engage or not engage in a certain behavior (Strecher and Rosenstock 1997).

2.2.1 Perceived susceptibility to Unhealthy pregnancy

Perceived susceptibility measures an individual's perception of his or her risk for a health condition or disease while perceived severity measures feelings surrounding the seriousness of the condition and the effects of leaving it untreated (Glanz et al. 1997). The combination of perceived susceptibility and perceived severity is considered as a threat or, more broadly, fear of a disease or health condition. Young women who don't like to take folic acid, multivitamin, vitamins supplementation and fruit and vegetable perceive chances of giving birth to children with birth defects and other complications that arise from unhealthy pregnancy.

2.2.2 Perceived benefits of practicing preconception care

Perceived benefits include positive consequences of adopting behavior. Young women who practice preconception care perceive that they stand to gain better chances of pregnancy outcomes and other non- reproductive benefits as a result of taking folic acid and other multivitamins supplementation.

2.2.3 Perceived barriers to Use of Folic acid

Perceived barriers include the perceived negative consequences of adopting behavior (Janz and Becker 1984). Though these barriers and benefits can be health related, often they are not. Instead, they might be associated to a greater degree to one's environment, lifestyle, or social surroundings. In this case they represent those factors that may prevent the young women from taking folic acid supplementation.

2.2.4 Self-efficacy to preconception care

Self-efficacy is characterized as the overall confidence in one's own ability to adopt and successfully perform behavior. Having a strong sense of self-efficacy is of great importance. People with high confidence in their capabilities approach difficult tasks as challenges to be mastered rather than as threats to be avoided.

In opposition people who doubt their capabilities afraid from difficult tasks which they view as personal threats. Thus, lack of self-efficacy can be viewed as a barrier to behavior. The ability of young women to acquire and practices preconception care and taken of folic acid supplementation would lead to successful practice of such behavior.

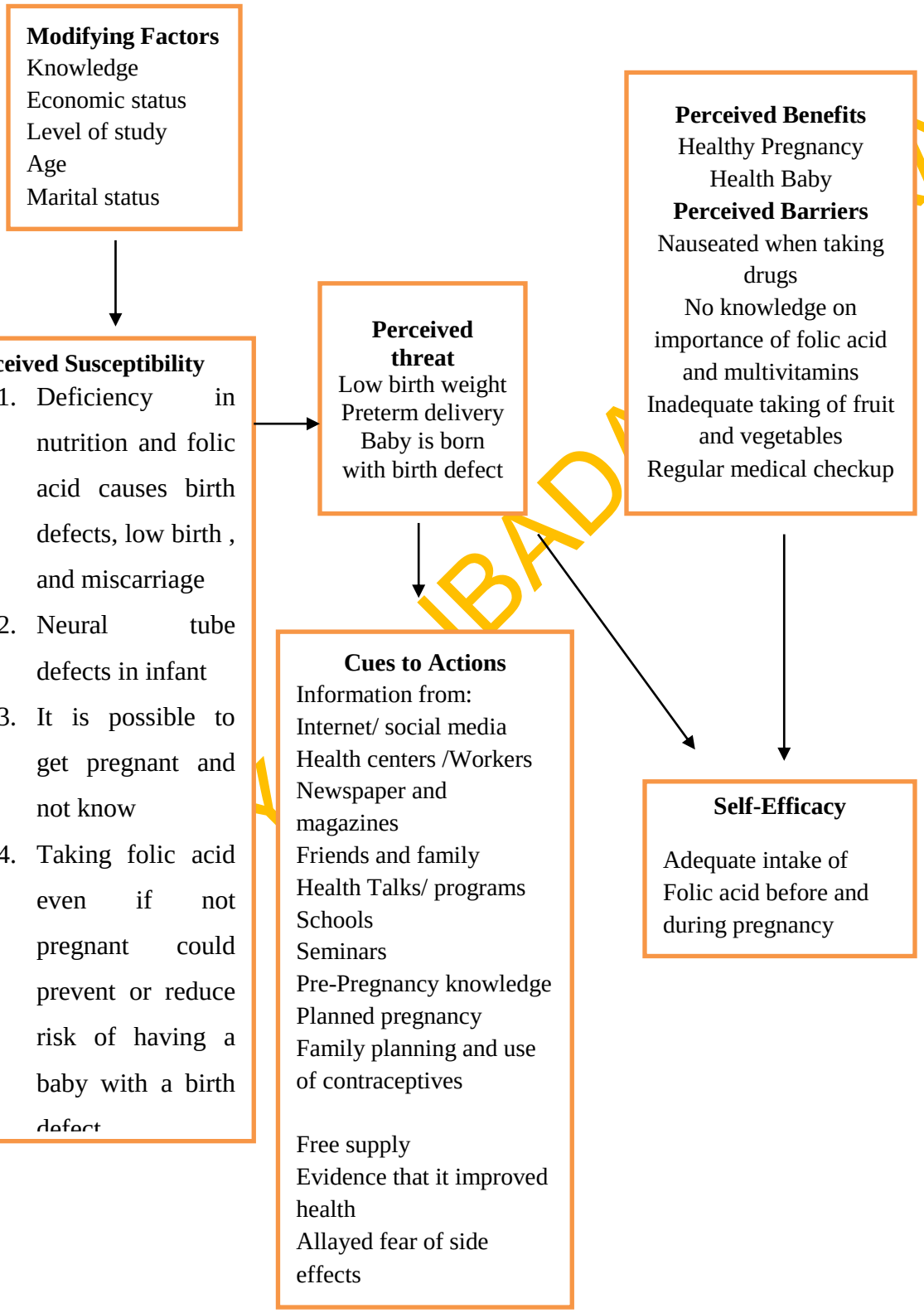
2.2.5 Cues to action to Use Folic acid

Cues to action refer to cues such as bodily events and environmental events that instigate action (Glanz et al. 1997). They are the reminders in our everyday lives that signal us to act in one way or another. The ability to receive information, encouragement, and positive feedback to support healthy habits is a critical contributor toward individual adoption and maintenance of healthy behaviors at a broad level (Berkman, Kamachi200).

In the absence of support, women not only behave in less healthy ways more often, they also experience more stress and greater depression (Misra et al, 2001).

Young women may require external factors such as advice from close relatives, health professional and daily reminder such as newspaper/ magazine, posters, radio and television documentaries to promote the practices of preconception care, use of folic acid, multivitamins supplementation and adequate intake of fruit and vegetable.

Figure 2.1: Health Belief Model illustrating factors influencing Preconception Care Practices



CHAPTER THREE

METHODOLOGY

This chapter presents the design, scope of study, description of the study site and area, study population and study variables. It also describes the sample size, sampling techniques, methods and instrument for data collection, validity and reliability, data management and analysis and ethical considerations.

3.1 Study Design

This study was a cross-sectional descriptive research which assessed the knowledge and practices of pre-conception care among final year female undergraduate students of Federal University of Technology, Akure, Ondo State, Nigeria. The study utilized quantitative method of data collection using semi-structured self-administered questionnaire

3.2 Description of Study Site

The study site is the Federal University Technology Akure, Nigeria, known as FUTA, The institution was founded in 1981 and it is geographically dereferenced on coordinate lines of 734393E, 808614N; on the western flank and 737291E, 806714N on the Eastern flank of meridians. Down to the south is Aule Community, up in its north is Ipinsa Community Lands interpose by Akure-Ilesa Express way, on the west Ilara-Mokin and Ibule settlements while to the east is southern part of Akure Metropolis, all these areas are made up of FUTA environs.

The institution has six schools; School of Environmental Technology, School of Engineering Technology, School of Agriculture and Agric Engineering, School of Earth Sciences, School of Sciences, Senate/Administrative structures and staff secondary/primary school, the school have a total number of 43 departments. The University has a total undergraduate student population of over 12000 and staff population of over 2000.The total number of male undergraduate's students is 8000 and 4000 female undergraduate's students. FUTA has seven hall of residence for undergraduates and is located for male while four is located for female, the names of the

hall residence are; Akindeko hall, Abiola hall, Adeniyi hall, Jadesola hall, Jibowu hall, Annex 1, and Annex 2.

The researches carried out on preconception care among students have been in the conventional institutions leaving out universities of technology and through extensive search from the libraries and the internet, none of these researches were carried out in FUTA (to the best of my knowledge) and hence the rationale for choosing this site so as to document the knowledge and practice of the female undergraduates of preconception care in FUTA.

3.3 Study Population

The study population consists of final year female undergraduates of FUTA.

3.4 Inclusion Criteria

Final year female undergraduate students of Federal Universities of Technology, Akure during the time of data collection were included in the study.

3.5 Exclusion Criteria

This study will exclude male undergraduate students, postgraduate students, part-time students or distance learning students and students who are not final year students during the course of data collection.

3.6 Sampling Procedure

Sampling Size Calculation

The sample size was calculated by using assumed prevalence of 50%. The sample size was estimated by using the Leslie Kish formula (1965) shown below:

$$N = = \frac{(Z\alpha)^2 pq}{d^2}$$

Where N is the minimum sample size

Zα = confidence limit of survey at 95% (1.96)

P= proportion of students

d= absolute deviation from the true value (degree of accuracy) =5%

n= 1.96*0.50*0.50 /0.5 =384.16 approximately=384

A non-response rate of 10% of 384=38.4 was added up to the sample size calculated to make the sample size 422.This is to cover for the possible case of incomplete response from respondents.

3.7 Sampling Technique

Multi-stage random sampling technique involves three strategies was used in selecting 384 respondents from the study.

Stage 1

There are six (6) schools in the university and the schools were used as a basis for grouping the study population into six major strata. The respondents in the institutions were stratified into 6 strata on the basis of their schools where they run their undergraduate programs. All the 6 schools were involved in the sampling procedure.

The six schools are;

1. School of science
2. School of engineering and technology
3. School of earth and mineral science
4. School of Agricultural and Agricultural Technology
5. School of Management Technology
6. School of Environmental Technology

Stage 2

Proportionate sampling technique was used to select 422 final year female undergraduate in the 6 schools to get the proper representation of the sample size. Respondents in each school were selected using systematic random sampling.

Table 3.2: Proportionate Distribution of Female Students by School in the University

S/N	School	No of Final Year Female Undergraduates	Proportion of respondents to be selected from each school	No of female Student
1	A	800	$\frac{800 \times 422}{1800} = 187$	187
2	B	68	$\frac{68 \times 422}{1800} = 15.9$	16
3	C	95	$\frac{95 \times 422}{1800} = 22.2$	22
4	D	425	$\frac{425 \times 422}{18000} = 99.6$	100
5	E	186	$\frac{186 \times 422}{1800} = 43.6$	44
6	F	226	$\frac{226 \times 422}{1800} = 52.9$	53
	Total	1800		422

Stage 3

All consenting respondents in each department participated in the study. Effort was made to collect information on the department that has more female.

3.8 Instrument for Data Collection

A self-administered, semi structured questionnaire was used for the survey. The questionnaire contained questions addressing research variables namely: Preconception care; it was divide into five section accordingly: Section 1; focused on socio demographic information about the respondents, Section 2; Is based on reproductive characteristics of the respondents, Section 3 was on knowledge of preconception care, Section 4

preconception care practices and section 5 was on basic factors affecting preconception care among the respondent.

3.9 Validity of the Instrument

Validity describes expected measure and the accuracy of the research measuring instruments. The questionnaire was critically examined by experts from the Department of Health Promotion and Education. The opinions of supervisor and experts were sought to ascertain the face and content validities of the develop instrument.

3.10 Reliability of the Instrument

Reliability of the instruments was ensured by conducting a pre-test among 38 (10% of minimum sample size), the student of University of Ibadan with a draft of the questionnaire to determine its consistency and accuracy. This was to determine how effective the developed instrument would be in collecting appropriate data relevant to the research objectives. Reliability analysis for questionnaire was done by using Cronbach - Alpha statistical test with a reliability coefficient of 0.801.

3.11 Data Collection Procedure

Four research assistants who were literate, mature and also have previous experiences on data collection were recruited and trained. The contents of the training included purpose of the study, interpersonal communication and data collection procedures. Survey was self-administered except where clarifications were sought from research officers on any items or questions. Questionnaire was administered to the 422 participants who met the inclusion criteria. To ensure privacy, the study respondents were allowed to complete the questionnaires wherever they are contented. Data were collected for the period of two weeks (16th to 28th of August).Four hundred and twenty two (422) questionnaires were distributed but almost like 10% of the questionnaires were not properly filled, therefore Three hundred and eight four (384) questionnaires were analyzed.

3.12 Data Analysis and Management

Data were entered into the computer after they had been sorted, edited and cleaned. Statistical Package for Social Science (SPSS) version 20 was used to analyze the data. Descriptive statistics such as frequency counts, percentages, means and standard deviation were used to present univariate data. Chi-square, binary logistic regression were used to determine associations and predictors of practice of preconception care with level of significance set at $p < 0 .05$.

A 4-point knowledge scale was used to assess the knowledge of the respondents on PCC: scores between 1point and 0 point indicated poor knowledge while respondents that scored 2 to 4 indicated good knowledge of PCC. 1 and 2 was used to code poor and good knowledge of PCC respectively.

Similarly, a 10-point practice scale was used to assess the practice of the respondents of PCC: scores between 0-5 indicated poor practice while scores greater than 5 indicated good practice of PCC. 1 and 2 was used to code poor and good practice of PCC respectively.

3.13 Ethical Consideration

The following ethical procedures were adopted in conducting this study. Firstly, approval was obtained from the Ondo State Ministry of Health. Secondly, approval was obtained from the Department of Health Promotion and Education, University of Ibadan. Written informed consent was obtained from respondents before administering questionnaire. Ethical issues like confidentiality, opportunity to decline interview at any stage and non-exposure to risk was also discussed with each respondent. Only respondents who were able to give informed consent and demonstrate an understanding of the objectives of the study were recruited into the study. A written consent was obtained though it did not require the names of the participants. They were informed that participation is voluntary and that data collected would be used mainly for research purposes. Anonymity and confidentiality of responses was ensured.

Confidentiality of data: In order to assure respondents of confidentiality of the information that were supplied, names of respondents were not required, only identification number was assigned to the questionnaires for proper recording.

Beneficence to participants: The outcome of the research will be of benefit not only to the participants, but to the other youth of reproductive age as it will help the women on how to have good outcome of conception and better nutritional status.

Non-maleficence to participants: The research does not require collection of invasive materials. Therefore, safety of the participants is guaranteed.

Voluntariness: The participants had full details concerning the research before taking part and they were not coerced to participate also they were told they could withdraw from the study whenever they wanted without any penalties attached so as to ensure that they fully understand the research and their willingness to take part in it.

3.14 Limitations of the study

The study was conducted only among female final year undergraduate students. Therefore, generalizing the results to all female undergraduate students must be done with caution. Also, the students were preparing for their examinations and were unable to fill the questionnaires immediately. However, the research assistants went back the following day to retrieve the questionnaires.

CHAPTER FOUR

RESULTS

4.1 Socio-demographic characteristics of the respondents

The age distribution of the respondents indicated that the age range was between 20-24 years with mean age of 23.6±2.3 years (Table 4.1a). Most of the respondents (90.1%) were single and 89.6% were Christians. Most of the respondents (90.4%) were Yoruba, 71.9% resided outside the institution premises while 28.1% resided within the institution.

Table 4.1b shows the socio-demographic characteristics of respondents' parents. Less than half of the respondents' fathers (47.4%) and mothers (40.4%) were civil servants. Slightly similar, half (50%) of the respondents' mother had tertiary education.

Table 4.1a: Socio-demographic characteristics of respondents

Socio-demographic variables	N(%)
Age	
<20	24 (6.3)
20-24	242 (63.0)
25-29	113 (29.4)
≥30	5 (1.3)
Mean±SD	23.6±2.3
Median (Range)	23.0 (15-32)
Marital Status	
Single	346 (90.1)
Married	23 (6.0)
Single and cohabiting	15 (3.9)
Religion	
Christianity	344 (89.6)
Islam	40 (10.5)
Ethnic group	
Yoruba	347 (90.4)
Igbo	19 (4.9)
Hausa	15 (3.9)
Edo	3 (0.8)
Resident location	
Outside campus	276 (71.9)
Within campus	108 (28.1)

n = 384

Table 4.1b: Socio-demographic characteristics of respondents' parents

Socio-demographic variables	N(%)
Fathers' occupation (n=313)	
Civil servant	182 (47.4)
Self employed	68 (17.7)
Artisan	24 (6.3)
Business man	16 (4.2)
Banker	13 (3.4)
Health professionals	12 (3.1)
Mothers' occupation (n=328)	
Civil servant	155 (40.4)
Self employed	93 (24.2)
Business woman	40 (10.4)
Health professionals	26 (6.8)
Artisan	14 (3.6)
Fathers' level of education (n=294)	
BSC/HND/Master	227 (59.1)
OND	57 (19.4)
Secondary	7 (2.4)
Primary	3 (1.0)
Mothers' level of education (n=303)	
BSC/HND/Master/PHD	192 (50.0)
OND	41 (13.5)
Secondary	68 (22.4)
Primary	2 (0.7)

4.2 Reproductive history of respondents

Table 4.2a shows the reproductive history of respondents. More than half (56.3%) of the respondents reported their age of menarche to be between 13-15 years, with mean age of 13.4±6.5 years. Majority (88.3%) of the respondents reported regular monthly period. Less than half (40.6%) of the respondents reported to be sexually active. Among respondents that were sexually active, 30.8% reported to have had sexual exposure one week and a month prior to the study. Slightly above one-tenth (11.5%) of the respondents had ever been pregnant, out of which, 77.3% reported that the pregnancy was unplanned and 40.9% reported to have aborted a pregnancy before. Major reasons stated by the respondents for aborting pregnancy included not prepared for pregnancy (27.8%), pregnancy not planned (61.1%) and pregnancy resulting from mistake (5.6%). Among the pregnancy prevention methods respondents reported to have adopted include condom use (56.4%), abstinence (21.8%) and pills (16.0%).

Table 4.2a: Reproductive characteristics of respondents

Reproductive characteristics	N(%)
Age of menarche (years)	
10-12	137 (35.7)
13-15	216 (56.3)
16-18	31 (8.1)
Mean±SD	13.4±6.5
Have regular monthly period	
Yes	339 (88.3)
No	45 (11.7)
Currently sexually active	
Yes	156 (40.6)
No	228 (59.4)
Last sexual intercourse experience (n=156)	
One week ago	48 (30.8)
Last month	48 (30.8)
Last six months	26 (16.7)
One year ago	18 (11.5)
Ever been pregnant	
Yes	44 (11.5)
No	340 (88.5)
Pregnancy planned (n=44)	
Planned	10 (22.7)
Unplanned	34 (77.3)
Aborted a pregnancy before (n=44)	
Yes	18 (40.9)
No	26 (59.1)
Reasons for aborting pregnancy (n=18)	
Not planned	11 (61.1)
Mistake	1 (5.6)
Planned	1 (5.6)
Not prepared	5 (27.8)
***Method used to prevent pregnancy (n=156)**	
Condom	88 (56.4)
Pills	25 (16.0)
Abstinence	34 (21.8)
++Others	9 (5.8)

++ Withdrawal, ovulation period check and injection

In Table 4.2b, 82.8%, 82.3% and 66.9% of the respondents reported to know their blood group, genotype and HIV status respectively. Many (94.5%) of the respondents have never been diagnosed with a STI and 89.1% reported to have never had any family history of STIs.

Table 4.2b: Reproductive characteristics of respondents (cont'd)

Reproductive characteristics	N (%)
Knew blood group	
Yes	318 (82.8)
No	66 (17.2)
Knew genotype	
Yes	316 (82.3)
No	68 (17.7)
Knew HIV status	
Yes	257 (66.9)
No	127 (33.1)
Ever been diagnosed with STIs	
Yes	21 (5.5)
No	363 (94.5)
Have any family history of STIs	
Yes	22 (5.7)
No	342 (89.1)
Don know	20 (5.2)

4.3 Awareness of preconception care among respondents

In respect to the level of awareness of the respondents about preconception care, Table 4.3a shows that less than half (47.7%) of the respondents have ever heard about preconception care. Among respondents that have ever heard about preconception care, 37.2% of them reported to have heard of it from the health professionals, 25.7% from families and/or friends, 24.6% from the internet and 12.6% from the TV/ Radio.

Table 4.3: Awareness of preconception care among respondents

Awareness	N(%)
Ever heard of preconception care	
Yes	183 (47.7)
No	201 (52.3)
Source of information on preconception care (=183)	
Health professionals	68 (37.2)
Family and friends	47 (25.7)
Internet	45 (24.6)
TV/Radio	23 (12.6)

4.4a: Knowledge of preconception care among respondents

As shown in Table 4.4a, 159 (41.4%) of the respondents correctly defined preconception care as care before pregnancy. Slightly above one-tenth (12.0%) of the respondents knew that preconception care should start 3 months before pregnancy, while 40.4% stated that it should be every day. Eighteen (4.7%) of the respondents knew that the recommended daily dose of folic acid required by women prior to conception is 400mg.

Table 4.4a: Knowledge of preconception care and practices among respondents

Knowledge variables	N (%)
Meaning of preconception care as care before conception	
Care before pregnancy	159 (41.4)
What you need to know about sex	30 (7.8)
++Others	11 (2.9)
Don't know	184 (47.9)
Period a woman should start preconception care	
Immediately the pregnancy is confirmed	62 (16.1)
When a woman is married	88 (22.9)
At least 3 months before pregnancy	46 (12.0)
Everyday	155 (40.4)
Immediately	14 (3.6)
At puberty	5 (1.3)
Don't know	14 (3.6)
Recommended daily amount of folic acid (mg)	
5	270 (70.5)
50	26 (6.8)
140	13 (3.4)
260	12 (3.1)
400	18 (4.7)

++ Type of care that focus on taking steps to prevent pregnancy, private part organ hygiene, pregnancy control, use of contraceptive to prevent pregnancy

Knowledge of preconception care and practices among respondents

The categorization of respondents' level of knowledge of preconception care is shown in Figure 4.4a. Knowledge of respondents was assessed on the meaning of preconception care, period when contraception should commence and recommended daily amount of folic acid required. Less than a-tenth [22 (6%)] of the respondents had good knowledge while 362 (94%) had poor knowledge of preconception care and practices.

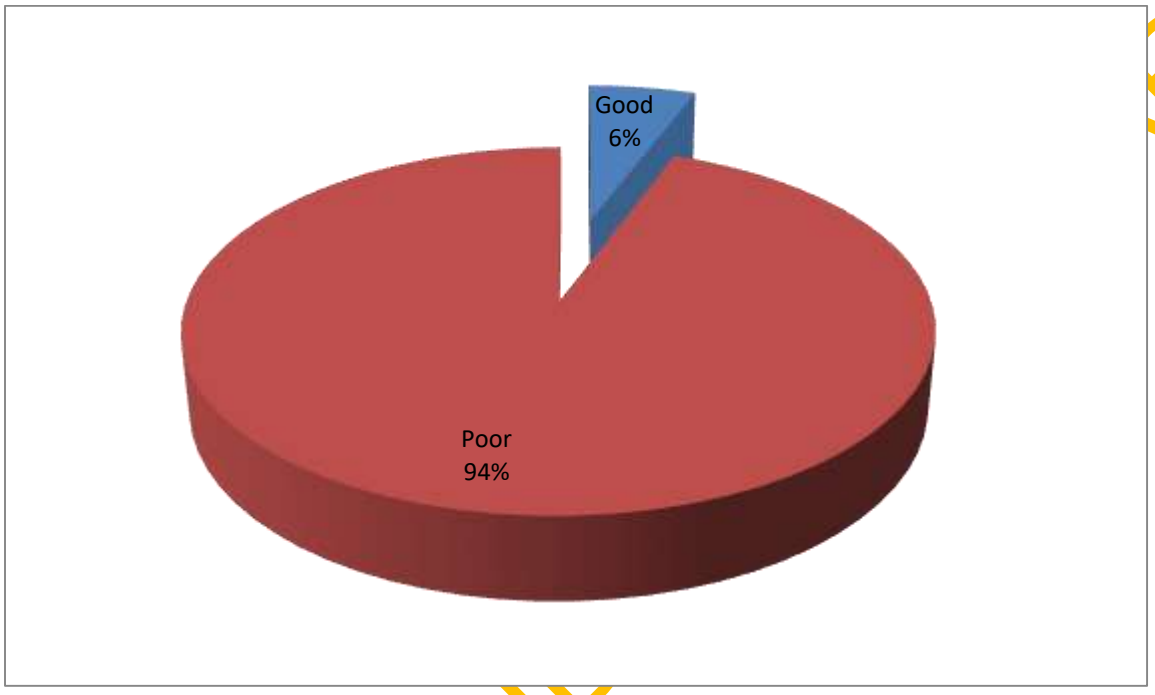


Figure 4.4a: Knowledge of preconception care among respondents

4.5 Intervention strategies to facilitate preconception care practices.

In table 4.5, intervention strategies reported by the respondents to facilitate preconception care practices include; nutritional care (80.2%) and vaccination practices (68.5%); prevention of tobacco and alcohol use (78.9%), environmental risk (75.8%) and STIs (82.0%); family medical and genetic history assessment (78.4%); infertility and sub fertility check (69.0%), prevention of mental health disorders (64.6%); health promotion against domestic and interpersonal violence (68.0%) and prevention of the use of psychoactive substances (64.6%).

Table 4.5: Intervention strategies to facilitate preconception care practices

Intervention strategies to facilitate preconception care practices	N (%)
Prevention of Sexually Transmitted Infections (STIs)	315 (82.0)
Nutritional care practices	308 (80.2)
Prevention of Tobacco and Alcohol use	303 (78.9)
Family Medical and Genetic History Assessment	301 (78.4)
Prevention and Treatment of HIV/Prevention Of Mother To Child Transmission	297 (77.5)
Prevention of Environmental Risks	291 (75.8)
Prevention of Early, Unwanted and Rapid Successive Pregnancies Issues	282 (73.4)
Prevention of Female Genital Mutilation	276 (71.9)
Infertility and Sub fertility Check	265 (69.0)
Vaccination practices	263 (68.5)
Health Promotion against Domestic and Interpersonal violence	261 (68.0)
Prevention of Mental Health Disorders	248 (64.6)

4.6a Preconception care practices among respondents

Table 4.6.a shows preconception care practices among the respondents. Eighty-eight (22.9%) of the respondents intend to begin preconception care before they get married, while 25.8% plans to start it after marriage. Many of the respondents reported not to be taking supplements such as folic acid (85.7%) and multivitamin (84.9%) in preparation for pregnancy. However, 50.0% of the respondents take fruit and vegetables. Furthermore, more than two-third of the respondents reported that they are not currently taking alcohol (76.0%) or smoking (96.9%) respectively.

Table 4.6.a: Preconception care practices among respondents

Preconception practices	N (%)
Period intended to begin preconception care	
Before marriage	88 (22.9)
After marriage	99 (25.8)
When pregnant	10 (2.6)
Ever taken folic acid as a step to prepare for pregnancy	
Yes	32 (8.3)
No	329 (85.7)
Currently taking multivitamin to prepare for pregnancy	
Yes	33 (8.6)
No	326 (84.9)
Currently taking fruit and vegetable	
Yes	192 (50.0)
No	182 (47.4)
Currently taking alcohol	
Yes	89 (23.2)
No	292 (76.0)
Currently smoking	
Yes	9 (2.3)
No	372 (96.9)

Preconception care practices among respondents

About one-third of the respondents (33.9%) had ever gone for HIV counseling and testing/STI test (table 4.6.2). Also, many (87.0%) of the respondents reported not to have ever undergone the BMI test and 40.4% reported to be currently engaged in daily exercise as a step to prepare for pregnancy. Close to a quarter (23.7%) of the respondents reported to be having the health insurance scheme.

Table 4.6.b: Preconception care practices among respondents

Preconception practices	N (%)
Ever done HCT/STI test	
Yes	130 (33.9)
No	247 (64.3)
Ever done BMI as a step to prepare for pregnancy	
Yes	34 (8.9)
No	334 (87.0)
Currently engaged in daily exercise	
Yes	155 (40.4)
No	227 (59.1)
Have health insurance scheme	
Yes	91 (23.7)
No	280 (72.9)

Based on the operational definition of preconception care practices stated in the materials and methods (data analysis) section of the study, 31% of the respondents had good practice of preconception care (Figure 4.2).

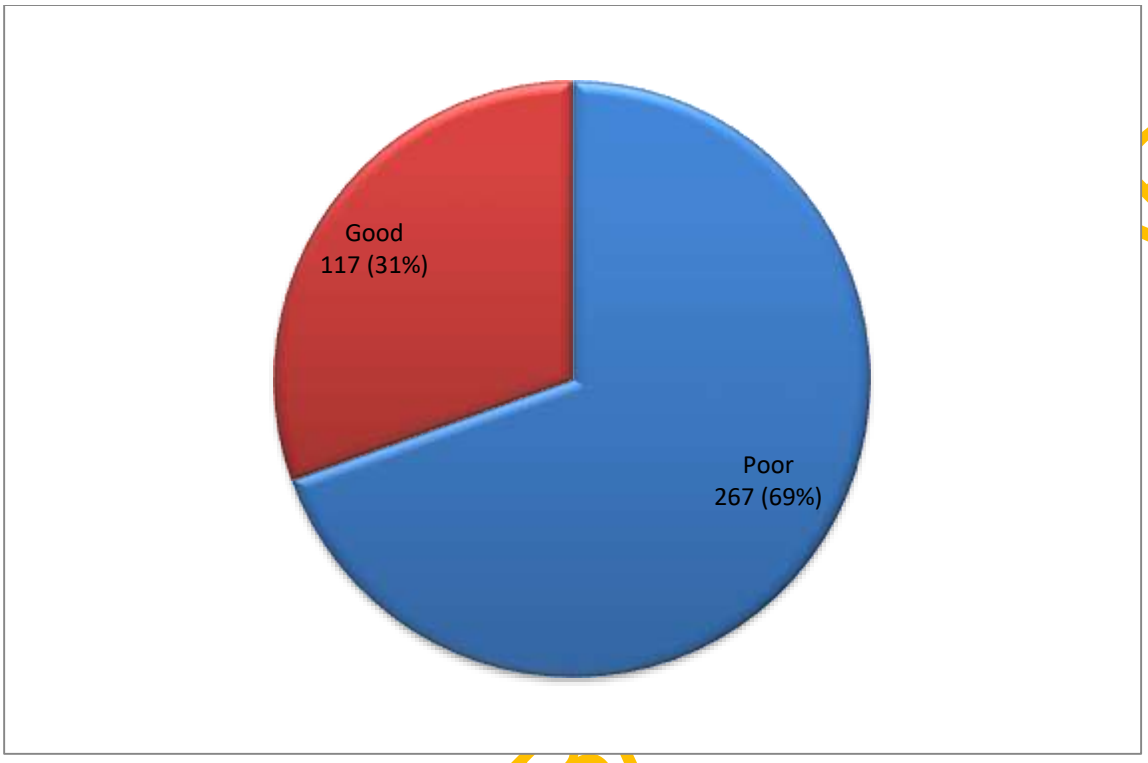


Figure 4.2: Preconception care practices among respondents

4.7 Antecedents factors influencing preconception care among respondents

Table 4.7a shows antecedents factors that may influence respondent's choice of preconception care practices. More than half (68.8%) of the respondents were currently planning to get married. Less than two-third (61.2%) of the respondents felt that there is need to go for medical screening prior to conception. The main reasons stated by the respondents for wanting to go for medical screening prior to conception were 'to know health status" (31.0%), "for medical checkup" (17%), and "safety of the baby" (10.2%). Among respondents that were does not feel that that there is a need to for medical screening, reasons stated by them include "for prevention purpose" (6.5%), "is not necessary" (16.1%) and "Is not required" (5.4%). Less than half (41.4%) of the respondents were not willing to seek for medical assistance before pregnancy. Main reasons given by the respondents for not willing to seek medical attention prior to pregnancy include; "lack of a need to seek medical attention" (71.7%), lack of fund (3.8%), attitude of health workers (5.0%) and fear of the result (1.9%). More than two-third (85.4%) of the respondents reported that their faith was not against preconception care practices.

Furthermore, table 4.7a shows antecedents factors reported by respondents to encourage them in practicing preconception care. These factors include improvement in outcome of pregnancy (60.5%), health status (22.1%), presence of the spouse (9.1) and family friends (8.3%).

Table 4.7: Antecedents factors influencing preconception care

	N (%)
Currently planning to marry	
Yes	264 (68.8)
No	120 (31.2)
Ever felt a need to go for medical screening prior to conception period	
Yes	235 (71.6)
No	93 (28.4)
Reasons for feeling the need to go for medical screening (n=235)	
To know health status	73 (31.0)
Medical check up	40 (17.0)
Safety of the baby	24 (10.2)
To avoid pregnancy complications	5 (2.1)
++Others	12 (5.1)
No response	81 (34.6)
Reasons for not feeling the need to go for medical screening (n=93)	
For prevention purpose	6 (6.5)
Is not necessary	15 (16.1)
Is not required	5 (5.4)
Willing to seek for medical assistance before pregnancy	
Yes	225 (58.6)
No	159 (41.4)
Reasons for not willing to seek for medical assistance (n=159)	
Don't see any need to	114 (71.7)
Lack of fund	6 (3.8)
Attitude of health workers	8 (5.0)
Fear of the result	3 (1.9)
Faith against preconception care	
Yes	15 (3.9)
No	328 (85.4)
Antecedents factors that may motivate preconception care	
Spouse	35 (9.1)
Family and friends	32 (8.3)
Because of health status	85 (22.1)
Good outcome of pregnancy	232 (60.5)

++For good reproductive system, to foster pregnancy, to acquire information on marriage

Hypothesis testing

4.8 Association between socio-demographic characteristics and knowledge of preconception care among respondents

In table 4.8, although none of the socio-demographic characteristics of respondents were significantly associated with knowledge of preconception care at $p<0.005$; the result of this study found that higher proportion (6.0%) of respondents that were less than or equal to 24 years have good knowledge of preconception care compared to those that were more than 24 years of age, $p=0.717$. More (8.7%) of respondents that were married have good knowledge of preconception care compared to those that were single (5.8%) and single/cohabiting (0.0%), $p=0.525$. Respondents that practice Islamic religion (10.0%) had better knowledge of preconception care compared to those that practice Christianity (5.2%), $p=0.219$. Slightly, higher proportion (5.8%) of respondents that were Yoruba had good knowledge of preconception care compared to those that were from other tribes such as Igbo, Hausa and Edo (5.4%), $p=0.929$. Respondents that resides outside the campus (6.2%) had better knowledge of preconception care compared to those that resides on-campus (4.6%), $p=0.562$.

4.8 Association between socio-demographic characteristics and knowledge of preconception care among respondents

Characteristics	Knowledge of preconception care		Total N=384	X^2	P-Value
	Good n(%)	Poor n(%)			
Age					
≤24	16 (6.0)	250 (94.0)	266	0.131	0.717
>24	6 (5.1)	112 (94.9)	118		
Marital Status					
Single	20 (5.8)	326 (94.2)	346	1.288	0.525
Married	2 (8.7)	21 (91.3)	23		
Single and cohabiting	0 (0.0)	15 (100.0)	15		
Religion					
Christianity	18 (5.2)	326 (94.8)	344	1.508	0.219
Islam	4 (10.0)	36 (90.0)	40		
Ethnic group					
Yoruba	20 (5.8)	327 (94.2)	347	0.008	0.929
**Others	2 (5.4)	35 (94.6)	37		
Resident location					
Outside campus	17 (6.2)	259 (93.8)	276	0.336	0.562
Within campus	5 (4.6)	103 (95.4)	108		

+ = Trading/Artisans, **Igbo, Hausa and Edo

4.8 Association between socio-demographic characteristics and preconception care practices among respondents

Table 4.8 shows the association between socio-demographic characteristics of respondents and preconception care practice. Among the characteristics of respondents studied, marital status and religion were found to be statistically significant with preconception care practice. Although not statistically significant, equal proportion (30.5% each) of respondents that were ≤24 years and >24 years have good preconception care practices, p=0.991. Significantly, more (56.5%) of respondents that were married had good practice of preconception care compared to those that were single and cohabiting (40.0%), and single only (28.3%), p=0.013. Higher proportion (45.0%) of respondents practicing the Islamic religion had good practice of preconception care compared to the Christians (28.8%), p= 0.035.

Furthermore, respondents that are from other ethnic groups such as Igbo, Hausa and Edo (27.0%) had better practice of preconception care compared to those that were Yoruba (16.4%), 0.106. More of respondents that reside outside the campus (31.2%) had good practice of preconception care compared to those that resides within campus (28.7%), 0.638.

Table 4.9: Association between socio-demographic characteristics and preconception care practices among respondents

Characteristics	Preconception care practices		Total N=384	X^2	P-Value
	Good n(%)	Poor n(%)			
Age					
≤24	81 (30.5)	185 (69.5)	266	0.000	0.991
>24	36 (30.5)	82 (69.5)	118		
Marital Status					
Single	98 (28.3)	248 (71.7)	346	8.764	0.013*
Married	13 (56.5)	10 (43.5)	23		
Single and cohabiting	6 (40.0)	9 (60.0)	15		
Religion					
Christianity	99 (28.8)	245 (71.2)	344	4.450	0.035*
Islam	18 (45.0)	22 (55.0)	40		
Ethnic group					
Yoruba	57 (16.4)	290 (83.6)	347	2.608	0.106
**Others	10 (27.0)	27 (73.0)	37		
Resident location					
Outside campus	86 (31.2)	190 (68.8)	276	0.221	0.638
Within campus	31 (28.7)	77 (71.3)	108		

+ Traders/Artisans, * Significant at p<0.05 **Igbo, Hausa and Edo

4.9 Association between knowledge of preconception care and practices of preconception care among respondents

Table 4.9 shows the relationship between knowledge of preconception care with practice of preconception care among the respondents. Significantly, higher proportion (39.4%) of respondents that had good knowledge of preconception care had good practice of preconception care compared to those that had poor knowledge of it (16.2%), p=0.001.

Table 4.9: Association between knowledge of respondents on preconception care and preconception care practices

Characteristics	Preconception care practices		Total N=384	X^2	P-Value
	Good n(%)	Poor n(%)			
Knowledge of preconception care					
Good	8 (36.4)	14 (63.6)	22	5.797	0.016*
Poor	59 (16.3)	303 (83.7)	362		

* Significant at p<0.05

4.10a Association between selected factors militating against preconception care and knowledge of preconception care among respondents

Although not statistical significant, more of the respondents that currently planned to marry (6.8%) had good knowledge of preconception care compared to those that were not planning to marry (3.3%), p=0.173 (Table 4.10a). Higher proportion (6.8%) of respondents that perceived that there is a need to go for medical checkup prior to conception had good knowledge of preconception care compared to those that felt there was no need to go for medical checkup (4.0%), p<0.253. Respondents that were willing to seek for medical assistance before pregnancy (7.6%) had more knowledge of preconception care compared to those that were not willing (3.1%), p=0.067. Furthermore, higher proportion (6.0%) of respondents that reported that their faith isn't against preconception care had good practice of preconception care compared to those that reported that their faith is against it (0.0%), p=0.330.

4.10a Association between selected factors militating against preconception care and knowledge of preconception care among respondents

Characteristics	Knowledge of preconception care		Total N=384	X^2	P-Value
	Good n(%)	Poor n(%)			
Currently planning to marry					
Yes	18 (6.8)	246 (93.2)	264	1.855	0.173
No	4 (3.3)	116 (96.7)	120		
Ever felt the need to go for medical screening prior to conception period					
Yes	16 (6.8)	219 (93.2)	235	1.306	0.253
No	6 (4.0)	143 (96.0)	149		
Willing to seek for medical assistance before pregnancy					
Yes	17 (7.6)	208 (92.4)	225	3.356	0.067
No	5 (3.1)	154 (96.9)	159		
Faith against preconception care					
Yes	0 (0.0)	15 (100.0)	15	0.949	0.330
No	22 (6.0)	347 (94.0)	369		

4.10b Association between selected factors militating against preconception care and practice of preconception care among respondents

In table 4.10b, a significantly higher proportion (33.7%) of respondents that were currently planning to marry had good practice of preconception care compared to those with no plan of getting married any time sooner (23.3%), p=0.041. Also, higher proportion (35.3%) of respondents that felt that there is a need to go for medical screening prior to conception had good practice of preconception care compared to those that were not in support of medical screening prior to conception (22.8%), p=0.010. Higher proportion (35.6%) of respondents that were willing to seek for medical assistance before pregnancy had good practice of preconception care compared to those that were not willing (22.8%), p=0.010. More of respondents that reported that their faith is against preconception care have good practice of preconception care compared to those that reported that their faith is not against it, p=0.413.

Table 4.10b: Association between selected factors that might militate against preconception care and practice of preconception care among respondents

Characteristics	Preconception care practices		Total	X^2	P-Value
	Good n(%)	Poor n(%)	N=384		
Currently planning to marry					
Yes	89 (33.7)	175 (66.3)	264	4.195	0.041
No	28 (23.3)	92 (76.7)	120		
Ever felt the need to go for medical screening prior to conception period					
Yes	83 (35.3)	152 (64.7)	235	6.726	0.010
No	34 (22.8)	115 (77.2)	149		
Willing to seek for medical assistance before pregnancy					
Yes	80 (35.6)	145 (64.4)	225	6.637	0.010
No	37 (23.3)	122 (76.7)	159		
Faith against preconception care					
Yes	6 (40.0)	9 (60.0)	15	0.669	0.413
No	111 (30.1)	258 (69.9)	369		

4.11: Multivariate Analysis of Factors Affecting preconception care practices among respondents

Table 4.11 shows the predictors of good preconception care practices among the respondents. The main significant factors that predicted good preconception care practices among the respondents were awareness of preconception care. Respondents that have ever heard about preconception care were about two times more likely to practice preconception care compared to those that have never heard. (OR=1.8, 95% CI= 1.0-3.1).

Table 4.11a: Multivariate Analysis of Factors Affecting preconception care practices among respondents

Variables	Odds ratio	95% Confidence interval Lower	Upper	P-value
Age				
≤24	1.043	0.568	1.915	0.892
+>24	1			
Marital Status				
Single and cohabiting	1.395	0.298	6.529	0.673
Married	4.861	0.838	28.202	0.078
+Single	1			
Religion				
Islam	1.558	0.676	3.591	0.298
+Christianity	1			
*No	1			
Ever heard of preconception care				
Yes	1.785	1.017	3.133	0.043*
+No	1			
Knowledge of preconception care				
Good	2.189	0.844	5.678	0.107
+Poor	1			
Currently planning to marry				
Yes	1.113	0.566	2.186	0.757
+No	1			
Ever felt the need to go for medical screening prior to conception period				
Yes	1.025	0.546	1.926	0.938
+No	1			
Willing to seek for medical assistance before pregnancy				
Yes	1.545	0.823	2.901	0.176
+No	1			

+Reference category * Significant at p<0.05

CHAPTER FIVE

DISCUSSION, CONCLUSION ANDRECOMMENDATION

5.1 Discussion

Preconception care has received increased attention due to the growing evidence that maternal health prior to conception can have a direct impact on the health of the mother and fetal environment during pregnancy (Committee on gynecologic practice, 2015). Despite the growing attention on preconception care, several studies have identified significant gaps in women knowledge and practice of preconception care (Chuang et al., 2010; Griffths et al., 2008; Mittal et al., 2014). This study also identified significant gaps relating to awareness and practice of preconception care among final year female undergraduate students of Federal University of Technology Akure, (FUTA). Nigeria.

The mean age and marital status of the study are similar to those in other studies conducted among female undergraduate students (Omoniyi and Balogun, 2009; Cadmus and Owoaje, 2011; Provident, Mark and Mwanajuma, 2014). The mean age at menarche of the respondents was in harmony with a study conducted among female undergraduate students in Uyo, Nigeria (Ekpenyong, Davis, Akpan and Daniel N, 2011). However, this is higher than the findings from a study among female medical undergraduate students in a University in India (Nirmala, Jayavani, Nivedhana,Padma and Vanajakshi, 2014).

This study found that less than half of the respondents were currently sexually active and just five in every one hundred of the total respondents reported to have experienced one STIs or the other meanwhile having STIs may actually affect the conception. This is similar to the result of similar studies on female undergraduate students in the southwest of Nigeria (Olaitan, 2010). However, this is higher than the findings from a study conducted in University of Ibadan among female undergraduates where only about a quarter of the respondents were sexually active (Cadmus and Owoaje, 2011). Among respondents that were sexually active, about one-third reported to have had sexual exposure one week and a month prior to the study. This is lower than the report from a similar study among young females of tertiary educational institutions in Ilorin, Nigeria

where more than half of the female undergraduate students reported to have had sexual intercourse within the past four weeks of the study. Slightly above one-tenth of the respondents had ever been pregnant. This is lower than the reports from other similar studies conducted in the country (Cadmus and Owoaje, 2011; Abiodun and Balogun, 2009).

From this study, less than half of those who had ever been pregnant had aborted before; abortion can actually cause Pelvic Inflammatory Disease (PID) which can affect women from getting pregnant at the right time. This is at variance with the findings of Cadmus and Owoaje (2011) where almost all the pregnancies among those who had ever been pregnant result into induced abortion. Similarly, the result from the study conducted by Somba (2014) which also indicated that more than half of the respondents who have ever been pregnant had induced abortion is higher than the findings in this study.This study revealed that the reasons stated by the respondents for aborting pregnancy included being not prepared for pregnancy. This is in agreement with reason given by female undergraduate students in a similar study conducted in the University of Ibadan where respondents who had ever terminated the pregnancy said they did so because they were not ready to bear the responsibility of having and raising a child (Cadmus and Owoaje, 2011).

Among the pregnancy prevention methods respondents reported to have adopted include abstinence, condom use and pills. This is similar to the findings by Provident et al., (2014) where the abstinence, condom use and pills were used as means of contraception among female undergraduates in a Tanzanian university. However, this was a little different from the experience of female students of tertiary educational institutions in Ilorin, who also used intrauterine contraceptive devices and injectable as means of contraception in addition to the afore-mentioned methods (Abiodun and Balogun, 2009). Findings from this study shows that the sources of information about PCC are the health workers, media, families and/or friends. These were in congruence with the sources of health education on contraceptives mentioned by female students of tertiary educational institutions in Ilorin (Abiodun and Balogun, 2009). This also corroborates the result of other past study among women of reproductive age in Nigeria where media, health

professionals, friends/relatives are sources of information on preventive health examinations (Oronje, Undie, Zulu and Crichton, 2011).

Overall, the study revealed that seven out of every ten respondents have good knowledge of preconception care. This may not be unconnected with their educational status as a University student. Previous studies identified education as an important factor influencing knowledge of preconception care (Ahmed et al., 2015). This is similar with the study conducted among female undergraduates of University of Benin on condom usage where seven out of every ten respondents had good knowledge of it.

Most of the respondents had never gone for HIV counseling and testing/STI test before because they perceived it as not necessary and if actually they tested and confirmed that they have they might get stigmatized about it. This is in variance with the finding of the study conducted among women of childbearing age in Uyo, Nigeria where majority of them had gone for HIV counseling and testing before (Udofia, Akwaowo and Ekanem, 2012).

Many of the respondents reported not to be taking supplements such as folic acid and multivitamin in preparation for pregnancy. This is in agreement with the findings of (Adu, Falade, Nwalutu, Elemoand Magbagbeola, 2009) who reported low fruits and vegetable consumption among undergraduate students of the Lagos State University in the Southwestern Nigeria. Similar to this finding, a research conducted to assess women's knowledge and practices concerning the use of folic acid as a preconception measure affirmed that young women aged less than 24 years showed the lowest knowledge level and less likelihood to report daily consumption of folic acid when compared to older women (CDC, 2007). This is comparable to the women of reproductive age in Oklahoma who were also reported to have low levels of regular pre-pregnancy vitamin consumption (PRAMSGRAM, 2008).

5.2. Conclusion

Reducing health costs and alleviating dysfunction that hinders healthy outcomes can be brought about by prevention practices. There is an urgent need for the government and other stakeholders in health system to prioritize resources to institutionalize prevention

and early identification practices of behavioural health across the population (Pathway Policy Brief, 2013).

Pregnancy health and outcome is dependent upon many factors, and important among the factors is the state of health of the mother prior to conception. Her preconception health status can be evaluated and improved in a variety of ways by receiving individualized preconception care (PRAMSGRAM, 2008).

Results from this study showed low practice of preconception care among the final year female undergraduates in Federal University of Technology despite their high knowledge of it. All stakeholders must be involved so as to reduce adverse pregnancy outcomes and consequently maternal and child mortality in the nation.

Provision of affordable preconception care services and empowerment of the students are important in ensuring student access this care. Relevant stakeholders such as the students' leaders and health professionals can also be engaged in motivating the students in accessing this care and advocacy to the school management for the formulation of policies that will favour the practice of preconception care.

5.3 Implication of the Study for Health Promotion and Education

Health promotion and education deals with provision of health education as well as advocating favorable policies and creating supportive environment, targeted towards helping the individual and the community make informed choices so as to promote healthy lifestyles and facilitate access to health services. This study has revealed low knowledge and low practice of preconception care among the final year female undergraduates in Federal University of Technology and the associated corresponding influencing factors. Addressing this gap can only be achieved jointly by the students, school management, government, health promoters and other stakeholders as failure to do so do affects pregnancy outcomes for these youths in the nearest future and this can lead to increase in maternal and child mortality in the nation.

Continuous health education on PCC must be ensured so as to achieve a hundred percent knowledge and to prevent future gap in knowledge. Provision of

affordablepreconception care services and empowerment of the students is important in ensuring student have access to this care. Relevant stakeholders such as the students' leaders and health professionals can also be engaged in motivating the students in accessing this care and advocacy to the school management for the formulation of policies that will favour the practice of preconception care.

Specific interventions targeted at female undergraduates such regular supply of fruits and multivitamins, regular provision of screening services in form outreach in the school, peer education training, periodic health talks and provision of Information and Education counseling (IEC), training of the health workers and so on can designed and implemented by health promoters to ensure the practice of preconception care.

Training

Training is one of the health promotion and health education strategies particularly used to impart knowledge and skills. This study identified a need for health educators and other health professionals to promote awareness about preconception health, inform childbearing aged women about the availability of preconception care services, and address the consequence of not practicing preconception health behavior. Furthermore, health educators need to emphasize the distinction between preconception care and prenatal care, and to clearly describe the perceived severity and urgency to engage in preconception care. Culturally sensitive messages targeting preconception women should be designed to focus on the importance of self-care and optimizing health prior to pregnancy. Furthermore, messages, health promotions, and health interventions should be tailored to meet the needs of preconception women of different ages, culture, race/ethnicity, and socioeconomic status.

5.4 Recommendations

In view of the findings of this study, the following recommendations are made:

1. Preconception care health education should be part of Federal University of Technology Akure (FUTA) school curriculum so as to educate both males and

females on the advantages of folic acid and multivitamin and usefulness of fruit and vegetables.

2. There should be an awareness of preconception care on FUTA F.M (radio station), internet/social media, and short messages services as a means of communication to young adolescents and youths of reproductive age. Parents should discuss the topic (Preconception Care) with their youths.
3. Federal University of Technology Akure health center and other health facilities should bring preconception care services closer to the students through organization of outreaches in the school.
4. For women with identified risks, additional counseling, testing and brief interventions e.g (for smoking, alcohol or changes in prescription medication) can be organized in the primary care setting certain women needs additional intensive intervention and special care.
5. There is also an urgent need to give full consideration to policies mandating fortification of foods available to all young women with folic acid and vitamins.

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APPENDICES

APPENDIX 1

KNOWLEDGE AND PRACTICE TOWARDS PRECONCEPTION CARE AMONG FINAL YEAR FEMALE UNDERGRADUATE STUDENTS OF FEDERAL UNIVERSITY OF TECHNOLOGY AKURE, ONDO STATE

Dear Respondent,

I am a postgraduate student of Public Health, University of Ibadan. I am conducting a research on the above subject matter. I wish to obtain information from you on preconception care. The information will help in promoting preconception care practices among young women. I plead with you to be very truthful in your responses and endeavor to answer all the questions as applicable to you. The information obtained will not be used against you, and it will be kept confidential. Your name is not required and participation in the study is voluntary and you are free to refuse to take part on this study. You also have a right to withdraw at any time if you choose to do so. Thank you.

Date

……

Signature/Thumbprint……

Serial number……

Appendix 2

Questionnaire

KNOWLEDGE AND PRACTICE TOWARDS PRECONCEPTION CARE AMONG FINAL YEAR FEMALE UNDERGRADUATE STUDENTS OF FEDERAL UNIVERSITY OF TECHNOLOGY AKURE, ONDO STATE

Instruction: please kindly respond by ticking (√) the available options or by completing the blank spaces provided.

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS

7. Faculty: ……
8. Department: …….

3. Age (in years) as at last birthday: ……..
4. Marital status: (1) Single/living alone (2) Married (3) Single/Co-habiting (4) Separated (5) Divorced (6) Widow
5. Religion: (1) Christianity (2) Islam (3) Traditional (4) Others (specify) ……
6. Ethnic group: (1) Yoruba (2) Ibo (3) Hausa (4) Others (specify)…….
7. Highest Level of Education: (1) SSCE/Equivalent (2) OND/Equivalent (3) HND/BSc (4) Others (specify)…….
8. Residence location: (1) Outside Campus (2) Within Campus (3) From Home (5) others Specify……
9. Father's occupation and level of education: …….
10. Mother's occupation and level of education: ……

SECTION B REPRODUCTIVE CHARACTERISTICS

11. How old are you when you began menstruation (period)? ……
12. Do you have regular monthly menstrual cycle? 1. Yes ( ) 2. No ( ) 3. Don't know ( )

13. When last did you have sexual intercourse? 1. One Week Ago ( ) 2.Last Month ( ) 3. Six months ago ( ) 4.one year ago ( )
14. Are you currently sexually active Yes ( ) 2. No ( ) 3. Don't know ( )
15a. Have you ever been pregnant? 1. Yes ( ) 2. No ( ) 3. Don't know ( )
b. If yes was the pregnancy planned or unplanned ……..
16. Have you ever aborted a pregnancy before? 1. Yes ( ) 2. No ( ) 3. Don't know ( )
If yes why? ……
17. Which of these are you using to prevent pregnancy? 1. Condom ( ) 2. Pills ( ) 3. Injection ( )
4. Abstinence ( ) 5. Others specify ……..
18. Do you know your blood group? 1. Yes ( ) 2. No ( ) 3. Don't know ()
19. Do you know your Genotype? 1. Yes ( ) 2. No ( ) 3. Don't know ( )
20. Have you ever been diagnosed with any sexually transmitted infection before? 1. Yes ( ) 2. No ( ) 3. Don't know ( )
22. Do you have any family medical history of STIs? 1. Yes ( ) 2. No ( ) 3. Don't know ( )
21. Do you know your HIV status? 1. Yes ( ) 2. No ( )
3. Don't know ( )
23. How soon do you plan to get married? …….

SECTION C KNOWLEDGE ON PRECONCEPTION CARE

24. Have you ever heard about preconception care? 1. Yes ( ) 2. No ( ) 3. Don't know ( )
25. What is pre-conception care? (What comes to your mind when you think of "pre-conception care"?)
……..……
……...……..

26. When should a woman start preconception care? (1) Immediately the pregnancy is confirmed

(2) When a woman is married (3) At least 3 months before pregnancy (4) I don't know.

27. What is the recommended daily amount of folic acid for a woman of child bearing age? (1) 400mg (2) 260mg (3) 140mg (4) 50mg(5) don't know (6) others specify …….

Answer the following by ticking (√) as appropriate to you

S/N	The following intervention strategies can facilitate preconception care practices:	Yes	No	Don't know
28	Nutritional care practices			
29	Vaccination practices (Rubella immunization, Tetanus Toxoid immunization, Hepatitis B immunization)			
30	Prevention of Tobacco and Alcohol use			
31	Prevention of Environmental Risks			
32	Prevention of Sexually Transmitted Infections (STIs)			
33	Family Medical and Genetic History Assessment			
34	Infertility and Subfertility Check			
35	Prevention of Mental Health Disorders			
36	Health Promotion against Domestic and Interpersonal violence			
37	Prevention of the Use of Psychoactive Substance			
38	Prevention and Treatment of HIV/Prevention Of Mother To Child Transmission			
39	Prevention of Female Genital Mutilation			
40	Prevention of Early, Unwanted and Rapid Successive Pregnancies Issues			

SECTION D: PRACTICES OF PRECONCEPTION CARE

41. Have you ever gone for medical checkup? 1. Yes ( ) 2. No ( )

42. If yes when last? 1. Less than a year ( ) 2. Within a year ( ) 3. More than a year ( )

43. When do you plan to start engaging in pre-conception care? …….

44. Have you ever taken folic acid as a step to prepare for pregnancy? 1. Yes ( ) 2. No ( ) 3. Don't know ( )

45. Do you currently take any multivitamin supplement as a step to prepare for pregnancy? 1. Yes ( ) 2. No ( ) 3. Don't know ( )

46. Have you done HIV/ STI test in the last 6month 1. Yes ( ) 2. No ( ) 3. Don't know ( )

47. Have you done Body Mass Index (BMI) as step to prepare for pregnancy 1. Yes ( ) 2. No ( ) 3. Don't know ( )

48. Do you perform an exercise daily? 1. Yes ( ) 2. No ( )

49. Do you have Health Insurance Scheme? 1. Yes ( ) 2. No ( ) 3. Don't know ( )

50. Did you take fruit/ vegetables consumption daily?
(1) Yes ( ) (2) No ( ) (3) don't know ( )

51. Have you ever been diagnosed with any of the following Sexually Transmitted Infections? (Circle all that apply) A. Chlamydia B. Genital Herpes C. Gonorrhea D. Hepatitis E. HIV/AIDS F. HPV (Human Papillomavirus) G. Syphilis H. None of the above I. Other (please specify) ……

52. Do you take alcoholic drink? 1. Yes ( ) 2. No ( )

53. Do you smoke? 1. Yes ( ) 2. No ( )

SECTION E: FACTORS AFFECTING PRECONCEPTION CARE

53. Are you planning to get married? 1. Yes ( ) 2. No ( ) 3. Don't know ( )

54. When do you intend (plan) to have a baby within…? A. The next 6 months B. The next 12 months C. The next 2 years D. The next 5 years

55. Do you think there is a need to go for medical screen prior to conception period? 1. Yes ( ) 2. No ( ) 3. Don't know ( )

If yes why? ……

If no why? ……

56. Would you like to seek medical assistance before getting pregnant? 1. Yes ( ) 2. No ( ) 3. Don't know ( )

b. If No why would you not seek medical help before getting pregnant? 1. Fear of the result 2. Lack of money 3. I don't see any need too 4. I don't like hospital 5.Attitude of the health workers Others (specify) ……

57. Is your Faith or spirituality against preconception care? 1. Yes ( ) 2. No ( ) 3. Don't know ( )

58. What will you like to know about preconception care? 1. Aspect of Nutritional care practices ( ) 2. Aspect of Environmental risk factors ( ) 3.Aspect of HIV/ Prevention of mother to child transmission ( ) 4.Aspect of Sexually Transmitted infections ( ) 5. Aspect of Health promotion against domestic and interpersonal violence ( )

59. What factors motivate you to engage in self-care prior to conception? 1. Spouse ( ) 2. Family and friends ( ) 3.Because of your health status ( ) 4. Good outcome of a pregnancy ( )

60. From which source of information do you wish to learn about preconception care? (Please tick as many answer as you find suitable) (1)Internet/social media (2) Television/ Radio

(3) Newspaper/ magazine (4) Health Centers/Workers (5) Churches/Mosque (6) Posters/Billboards (7) Health Talks/ programs (8) Friends and Colleagues (9) Schools (10) others (specify)……