

PRECONCEPTION CARE AND GENETIC COUNSELING: IMPLICATIONS FOR THE MIDWIFE (A REVIEW)

Chizoma M. NDIKOM; Ikenna N. OJIEGBE; Esther I. OJIEGBE

Correspondence address: cmndikom@gmail.com

Abstract

Many women give birth to babies with various genetic or congenital abnormalities and other complications but are totally unprepared for the experience. These among several others are the negative consequences that could result from poor preconception health which could cause perpetual sorrow in the future. Preconception care and genetic counselling can increase the health and well-being of women and couples and improve subsequent pregnancy and child health outcomes. This paper discusses the issues in relation to preconception care and genetic screening and counselling. Preconception care is beneficial to both low risk and high-risk women in preventing foetal abnormalities and helps to reduce the incidence of foetal anomalies, poor pregnancy outcomes and genetic abnormalities as risk factors would have been noticed and proper counsel given to prevent the occurrence of abnormality. Its long-term outcome also results in healthy women, healthy men, healthy babies, healthy families and healthy societies. Preconception care is a need that should be incorporated into every country's health care system. There should be increased public awareness of the importance of preconception healthcare services by using information and tools appropriate across various ages, literacy, including health literacy; and cultural/linguistic contexts. The midwife has significant roles to play and must have up to date information about preconception care and genetic counselling and screening.

Keywords: Preconception care: Genetic counselling: Midwives: Health: Screening.

Introduction

The coming of a new baby is usually a joyful event, but when the child is born with genetic abnormality, the joy quickly turns to sadness or ambivalence (Wheeler, 2016). Many women give birth to babies with various genetic or congenital abnormalities and other complications, an experience which undoubtedly, they are unprepared for. Usually, the problem is not detected early and no professional counselling is given before the arrival of the baby (Anupam and Singh, 2010; Leonard, 1986). Sometimes conception may be difficult or delayed and after it is achieved, aggravates existing health conditions which could lead to loss of life or termination of pregnancy, thereby posing more stress and strain to the family.

This physical and psychological strain is preventable through preconception care whose goal, according to Tajan (2016) is to enhance positive outcome of pregnancy and overall health status of women by preventing medical problems and the associated conditions that could impact negatively on childbirth. Overall, preconception care targets to protect the health of children before they are born to the time they have grown and could be of great advantage to all people, whether or not they plan to have a child in the future (CDC, 2014). Nurses and midwives play major roles in advocating for policies that promote the provision and proper utilization of preconception care in order to help women and their partners achieve optimal pregnancy outcome.

Methodology

Literature search was carried out using PubMed, Google Scholar and other relevant websites. Also, articles were sought from the World bank, WHO, UNICEF, United Nation Population Fund (UNPF) and UN. Centre for disease control (CDC) documents and publications, articles with information on preconception care, genetic counselling, genetic screening, pregnancy planning, midwife roles in preconception care, genetic anomalies were reviewed for relevant information. There were not so many articles on the midwife's roles and activities regarding preconception care provision.

Concept of Preconception care

Preconception care is the healthcare service that provides biomedical, social health and behavioural interventions to women and couples before they plan a pregnancy (WHO, 2013). It can also be described as individualized care for men and women focused on preventing maternal and foetal morbidity and death, increasing the chances of conception when pregnancy is desired, and making family planning available to prevent unintended pregnancies (American Academy of Family Physicians, 2020). Its major goal is to enhance the health status of both the mother and child, and also to curb negative factors and conditions that could result to adverse health consequence on the mother and child (WHO, 2013).

Definition of forms of Preconception healthcare

- Preconception care: This form of care involves prevention of diseases, promotion of health or curing of illness and social healthcare before the woman conceives (WHO, 2013).
- Peri-conception care: This involves care provided around conception, that is, from three months before the woman becomes pregnant to three months after conception takes place (WHO, 2013).
- Inter-conception care: This is a combination of preconception and peri-conception care provided to the woman and family between two pregnancies (WHO, 2013).
- Preconception health: This refers to the health of the couple during their childbearing years and it targets measures which couple and healthcare providers could employ to curb dangers of childbirth, encourage positive lifestyles changes, and promote chances for conception (CDC, 2014).
- Preconception health care: This is the healthcare that is given to the couple by the healthcare providers with the goal of providing care that promotes conception and delivery of healthy babies (CDC, 2014).
- Preconception health promotion: This is a preventive measure that enhances the health of the woman and her husband thereby enabling them to get ready for conception (Best Start Resource Centre, 2009).

Rationales and justifications for preconception care Worldwide, preconception care is a need that should be incorporated into every county's health care system. According to WHO (2013) preconception care is pertinent to promote the health status of men and women and couples thereby leading to safe pregnancy and childbirth. Preconception care provides the opportunities to prevent and control illnesses by providing beneficial health activities that enable children from infancy through childhood to adulthood stay healthy (WHO, 2013). Studies have shown several negative health consequences that could result from lack of preconception care thereby resulting to grief and perpetual sorrow in the future. A study by Best Start Resource Centre (2009) found the health consequences associated with improper practice of preconception care including infertility, problems during antenatal period and prolonged neonatal health concerns. They further observed that improper practice of preconception care could lead to congenital abnormalities, low birth weight, prematurity, difficulty in achieving pregnancy, and slow developmental process (Best Start Resource Centre, 2009).

According to a study conducted by WHO (2013), four out of ten expectant mothers revealed that they did not plan their pregnancies. This resulted in them having their first antenatal visit at eight weeks gestation or later, even though, earlier than this period carries the greatest risk to foetal development (American Family Physician, 2002). This is the period when most birth defects occur, often before pregnancy is confirmed and antenatal visits commence, hence, pertinent health care given once a couple considers having a baby will be too late in forty percent of conceptions (Gregory and Davidson, 1999; WHO, 2013). Furthermore, when started, at least one month before pregnancy, intake of folic acid tablets has been proven to reduce the chances of having a child with neural tube defects such as anencephaly and spina bifida (Gregory and Davidson, 1999). Thus, the usual early antenatal booking could be too late in enhancing reproductive health outcome when there is abnormality of organogenesis due to over the counter medications use, alcohol abuse, smoking and imbalance nutrition (Keith, 2002). Therefore, it is important to note that all women of childbearing age can benefit from preconception healthcare and it should occur throughout the reproductive years whether or not they plan to get pregnant (American Academy of Family Physicians, 2007; Lea, 2002).

Components of preconception care

The components of preconception care can be grouped into four categories which include: physical assessment, risk screening, vaccinations, and counselling (The American Academy of Paediatrics and the American College of Obstetricians and Gynaecologists, 2002).

Physical examination/assessment: The physical assessment emphasizes the overall appearance of the woman, her diet, checking of vital signs such as pulse, height and weight, assessment of the pelvic region and other significant body areas. Routine physical assessment may not always be recommended for women of childbearing age who appear healthy, nevertheless, some health care providers may want to conduct some levels of screening such as screening for sexually transmitted infections, cervical cancer and other body mass index (BMI) related assessments (Public Health Agency of Canada, 2019).

Risk screening/assessment and vaccinations: Risk screening/assessment involves obtaining the history in the following areas identified by the Public Health Agency of Canada (2019):

Reproductive history: Reproductive history is a crucial tool that could be used to obtain information which may point to the woman's likelihood of having

problem with her reproductive life. Reproductive history involves the woman's use of family planning, sexually transmitted infections, miscarriages, history of menstruation and other reproductive health issues (Stubblefield, Coonrod, Reddy, Sayegh, Nicholson, Rychlik, et al. 2008). Women with increased risk for any medical condition should be encouraged to seek for advice and healthcare from their health care providers before they plan for conception (Public Health Agency of Canada, 2019).

Age, genetic and family history: It is pertinent to consider the age, genetic and family history of the woman and the man before they get married when providing preconception health care (Stubblefield, Coonrod, Reddy, Sayegh, Nicholson, Rychlik, et al. 2008). Findings of their study also reveal increased risks for numerous genetic problems among Jewish Ashkenazi, sickle cell anaemia among Africans whereas there is higher chances of thalassemia among Mediterranean and Asian (Stubblefield, Coonrod, Reddy, Sayegh, Nicholson, Rychlik, et al. 2008). Therefore, identification of known genetic disorders, congenital malformations or developmental retardation would necessitate health care providers' conduct of comprehensive history and/or refer couples for genetic counselling and screening (Public Health Agency of Canada, 2019). History should also capture both the age of the woman and that of the spouse because when maternal age is high there is increased chance of having babies with malformations. On the other hand, the man's age when more than 40 years can negatively affect the quality of sperm thereby predisposing the baby to congenital anomaly (Public Health Agency of Canada, 2019). Sequel to these problematic genetic and chromosomal predispositions as a result of the increased age of the couple, the nurse, the midwife and other proficient medical personnel should include the discussion of the potential threat of congenital and chromosomal abnormalities, advanced age and delays in getting pregnant could pose to the unborn child during preconception care (Society of Obstetricians and Gynaecologists of Canada, 2012).

Environmental hazards and toxins: Some environmental toxins are believed to predispose to grave consequences on the development of the baby's brain, and these involve substances such as the lead, mercury, soil and water contaminants, organic solvents pesticides, aesthetic gases, X-ray radiation etc (Best Start Resource Centre, 2005; Public Health Agency of Canada, 2019). The health impacts of preconception and prenatal exposure to toxins are inherently complex and thus difficult to verify with certainty (Public Health Agency of Canada, 2019).

Nutrition: It is important that the woman maintains healthy and adequate dietary pattern before conception to improve her overall health status and thereby lead to a healthy baby and mother by the end of the pregnancy (Public Health Agency of Canada, 2019). It is also necessary that she eat foods high in certain nutrients such as foods rich in folic acid, iron, calcium, vitamin D among others during the preconception period in order to promote the health of the baby (Bhutta, Das, Rizvi, Gaffey, WalkerN, Horton, et al., 2013). The woman should also be encouraged to eat adequate vegetables and fruits, milk low in fat, whole grains, fish, and oils with high density cholesterol, and should reduce or avoid processed foods, excess salt and sugar (Health Canada, 2011).

Healthy body weight: Low or high body mass index before pregnancy could pose a problem to the unborn baby which can be minimized if an overweight woman reduces her weight and the underweight woman gain more weight (Public Health Agency of Canada, 2016). Maternal obesity is a condition that could lead to increased risk of miscarriage, fertility failure, congenital abnormalities involving defects of the neural tube and cardiac problems, among other neonatal and foetal anomalies (Society of Obstetricians and Gynaecologists of Canada, 2010; Stothard, Tennant, Bell and Rankin, 2009). Findings of many studies have shown that high dosage of folic acid is beneficial to women who are obese especially when taken 3 months or less before pregnancy and during the first three months of gestation (Parker, Yazdy, Tinker, Mitchell and Werler, 2013). When women who are obese lose 5 to 10 percent of their weight, their chances of achieving healthy pregnancies increases (Clark, Ledger, Galletly, Tomlinson, Blaney, Wang, et al., 1995).

Physical activity: According to the Canadian Society for Exercise Physiology (2011), the recommended length of adequate exercise for adult that will help keep fit even during pregnancy without compromising fertility, pregnancy, health of the mother or baby is 150 minutes per week. Nonetheless, some environments of exercises such as the hot yoga studios may increase the body temperature of pregnant women and body metabolism thereby increasing the baby's risk to congenital anomaly (Canadian Academy of Sport Medicine and Exercise, 2015).

Substance use: It is important that women and their spouses abstain from harmful habits and consumption of alcohol and tobacco when planning for conception (Society of Obstetricians and Gynaecologists of Canada, 2010). Also, the use of

some illicit drugs and substances by men could interfere with the DNA of the spermatozoa and may not give the sperm chance to regenerate within 3 months, hence the need for preconception counselling (Frey, Navarro, Kotelchuck and Lu, 2008).

Medications: It is necessary to discuss with the woman and husband about their medication history during antenatal period because around 50% of pregnancies are not planned, so that important counselling will be provided to them and encourage them to quit dangerous drugs and as a result, prevent their effects on the mother and unborn babies (Public Health Agency of Canada, 2019; Finer and Henshaw, 2006).

Oral health: Maintaining oral health is a key in ensuring the overall well-being of both the mother and baby as several studies have shown associations between poor maternal oral health and negative birth outcomes, such as preterm birth, preeclampsia, and intrauterine growth retardation (Boggess and Edelstein, 2006). Therefore, ensuring that the woman's oral and dental health is properly maintained before conception promotes high chances of positive pregnancy prognosis (Boggess and Edelstein, 2006). Hence, couples should be exposed to counselling sessions on oral health and dental hygiene which will help reduce oral infection throughout the antenatal periods (Public Health Agency of Canada, 2019).

Immunizations and infectious diseases: There are many infectious diseases that can effectively be curbed with vaccines, but could pose threat and danger on the unborn babies if ignored, such as congenital rubella syndrome in infants leading to deafness and other severe conditions (Public Health Agency of Canada, 2019). When a pregnant woman is infected with Varicella infection, the pregnancy is at increased risk for abortion, perinatal death, and several abnormalities (De Santis, Cavaliere, Straface and Caruso, 2006). Some vaccines identified by Coollen (2019) to be considered for women before pregnancy include varicella, measles, mumps, rubella, hepatitis and human papilloma virus vaccines.

Non-vaccine-preventable infectious diseases: Various diseases could negatively affect the fertility of the expectant mother and final outcome of the conception, but could be addressed during preconception health education, counselling, screening, and management (Public Health Agency of Canada, 2019). Therefore, both women and their husbands will benefit if they are screened for Sexually Transmitted Infection before conception to prevent the associated complications (Public Health Agency

of Canada, 2015). Also, universal hand washing should be recommended in order to prevent infectious diseases from spreading from one person to another (Public Health Agency of Canada, 2019).

Intimate partner violence: Physical and emotional traumas inflicted on some women experience by their partners have prolonged grave effects on the women's reproductive health resulting in complications during pregnancy and frequent unintended and unplanned pregnancy (American College of Obstetricians and Gynecologists, 2012).

Mental health and illness: Existing studies have shown significant relationship between psychological symptoms which some mothers suffer from and poor pregnancy, childbirth and postnatal outcome and delayed breastfeeding initiation (Grigoriadis, et al 2013). We therefore recommend for health care providers, especially the midwives to be watchful for signs of mental problems by assessing for personal and family history of mental illness (Public Health Agency of Canada, 2019; Canadian Task Force on Preventive Health Care, 2013).

Women with specific needs: They include women with advanced maternal age/ delayed child-bearing, women who require assisted human reproduction, adolescents, women who have experienced female genital cuttings, Lesbians, Gays, Bisexuals, Transgender, women with disability as a result of health issues, immigrants and cancer survivors (Public Health Agency of Canada, 2019; CDC, 2014). They should be counselled according to their specific needs and referred to appropriate care providers for expert care where necessary.

Preconception and Genetic Counselling

Genetic counselling is the means through which information about the genetic aspects of illnesses is passed by trained healthcare professionals to women and their partners who are at increased risk for or possess a heritable disorder that could be transferred to their unborn children (WHO, 2020). It can also be described as an interactive session with the goal of assisting families in understanding and adapting to the health and reproductive needs of their genetic dispositions to specific health problems (Human Genetics Society of Australasia, 2020). Genetic counselling is designed to enable women and her family to have a level of understanding of genetic problems, how they are inherited and how the couple could make changes in preparation for future pregnancies (Health direct, 2020).

Genetic counselling is usually given before genetic screening exercise (Evans, Bui, and Yaron, 2003). The process and outcomes of genetic counselling

have been of immense importance in achieving the aim and objectives of preconception health care which is to have a healthy baby and mother at the end of pregnancy and childbirth, but these have been infrequently documented by empirical studies (Marymee, 1998).

Genetic Screening/ Testing

Genetic Screening is an essential aspect of preconception care which may be prescribed depending on the intending parents' genetic and ethnicity history, and genetic counselling is usually given before the screening. Genetic testing on the other hand involves laboratory investigations to detect any genetic problems such as changes in genes and chromosomes (US National Library of Medicine, 2020)

Types of genetic tests

Some types of genetic test identified by US National Library of Medicine (2020) include the following:

- New-born screening: These are used to detect genetic problems that can be managed immediately the baby is born, these include disorders such as hypothyroidism, phenylketonuria and others.
- Diagnostic testing: This is usually employed to confirm a diagnosis of a genetic or chromosomal abnormality especially when the symptom of a particular genetic condition is suspected. Diagnostic testing can be done at any time either before conception, during pregnancy or at any time of a woman's life depending on the test type and the condition she is testing for.
- Carrier testing: This is employed to single out women or men that possess a copy of an abnormal gene that lead to a genetic disorder when found in two copies. This is usually used in cases of disorder that is rampant in an ethnic group or family history of a genetic disorder.
- Prenatal testing: This is used to detect any changes in the chromosomes of unborn babies during pregnancy to find out the degree of the foetuses' risk of congenital problems
- Pre-implantation testing: This is also known as pre-implantation genetic diagnosis (PGD), which is a method that could prevent risk of genetic disorders in children and can even be detected from the embryonic stage of in-vitro fertilization.
- Predictive and pre-symptomatic testing: These are tests employed after the baby is born to detect gene and chromosomal abnormalities that could result to genetic disorders later in life of the baby. This can detect mutations that predispose to genetic disorders such as some kinds of cancer thereby determining if a baby will suffer a genetic problem in the future.
- Forensic testing: This kind of testing is not used to detect gene mutations, but used to detect, rule out or implicate a crime suspect and also can be used to detect paternity or confirm biological relationships between a baby and a man using DNA sequences.

Benefits and Outcome of Preconception Care and genetic counselling

The evidence-based effectiveness of preconception health care is evident in the findings of existing studies. A study by Lassi et al (2014) found that proper management of diabetes of the mother before pregnancy can offer about 70 percent reduction in the baby's chances of having congenital malformations and experiencing perinatal death. Hence, preconception care in women with medical conditions such as epilepsy, phenylketonuria among others should be encouraged in order to enhance the health of the mother, and pregnancy outcomes (Lassi et al, 2014). According to CDC (2014) the benefits of preconception health care can be discussed as follow:

- Healthy Women: preconception health gives every woman the chance to take control of themselves and choose healthy habits in order to promote their well and healthy living, and feel good about their lives, whether or not they plan to get pregnant (CDC, 2014).
- Healthy Men: Preconception health is also beneficial to men, since it enables them to prepare and plan for bright and healthy future of the entire family. This implies that men are to be ready to comply with all the preconception counselling and advice to remain healthy and assist their wives to achieve the same. As partners, men should support at all times the enhancement of their wives' health. As fathers, they should protect their children and help them to comply with Preconception health care guideline (CDC, 2014).
- Healthy Babies: For the babies, preconception health involves their parents taking all necessary steps to be healthy and avoid life styles that could endanger their life before pregnancy. As a result, prematurity, low birth weight, birth defects or other disabling health related issues are minimized or prevented. Preconception health serves as the best gift babies could get from their parents and the healthcare provider which gives them the best chance for better and healthy start in life (CDC, 2014).
- Healthy Families: Ensuring preconception health is a great way to create a healthy family. The health of a family depends largely on the health of the individuals in the family. Therefore, it is important that all members of the family comply with preconception health services in order to

ensure enhanced quality of life for everyone in the family all through the years (CDC, 2014).

Theoretical Framework for Genetic Counselling

The ABC theory of emotional disturbance is seen a concept in cognitive behavioural therapy (CBT) that can be used to solve many health problems. It guides one in understanding the importance of pre-screening and post genetic screening counselling. Lam and Gale (2000) state that “educating clients to understand how and what they think is an important part of the therapeutic process”. They propounded the seven-step ABC Model.

‘A’ is the activating event or the existence of a situation, ‘C’ is the emotional and the behavioural consequence or reaction of the woman or the couple. According to this theory, A (the activating event) does not bring about C (the emotional and behavioural consequence). It is B (the woman’s interpretations of, and assumptions about, A) that is largely responsible for C, the woman’s emotional and behavioural reactions.

Figure (1) shows the association between A, B and C. For instance, if a couple experiences fear of having a baby with genetic anomaly, it may not be the genetic anomaly itself (at point A) that causes fear or anxiety reaction (at point C) but the couple’s interpretations of assumptions about having an abnormal baby, feeling of being responsible for the cause of the genetic problem and being unable to find appropriate solution.

Beck (1976) reveals that these beliefs are the major causes of the way the couple interprets the assumptions made about the genetic anomaly. For instance, what proof does the couple have to show that their prediction of being the cause or going to cause genetic problem in their babies? However, while the woman is going through pregnancy, they could be afraid that something bad will happen. These are not necessary since there is no prove that they are responsible for their children’s challenge. If these assumptions are not detected and tested, and handled properly, the couple is likely to experience anxiety and fear of the unknown outcome of the pregnancy.

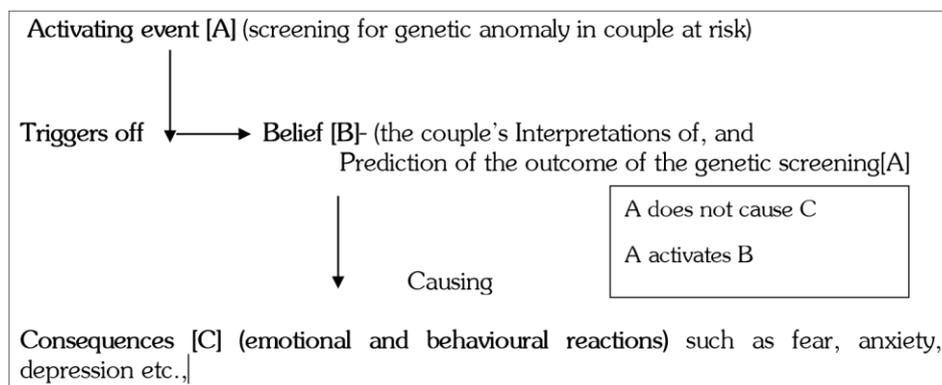


Figure 1: Relationship between A, B and C (Lam and Gale, 2000)

The seven steps of ABC model will be outlined as follows:

- **Step 1:** This introduces the concept of Cognitive Behavioural Therapy (CBT) which explains that people should know that individuals are bordered not by ‘external things’ but by the way they view them.
- **Step 2:** This involves illustrating with examples what the philosophy of ABC is all about, which will enable the couple to be objective and rational as they are being enlightened about the ABC concept. It can help the couple to reflect on their reasoning and to compare their emotional experiences to the concept of ABC.
- **Step 3:** The connection between A and C shows that it is not the event (at point A) leads to emotional and behavioural problem (at point C).
- **Step 4:** The connection between B and C (which is the unnecessary belief) shows that it is the

meaning the couple make of it and their assumptions about the event that are majorly the cause for the problems (at point C). It shows that the interpretations /assumptions are not evidence based and therefore unnecessary.

- **Step 5:** The connection between B and C (which is the unnecessary belief) could enable the couple to realize that an event can be viewed from different ways.
- **Step 6:** It is important to get feedback from the couple, because it will enable the clarification of any misinterpretation of the ABC concept. This step motivates the couple to analyze and discover themselves
- **Step 7:** The midwives should help the couple to gain enough information which in turn strengthens their rationale about the concept of ABC.

Prenatal genetic screening gives rise to some emotional reaction like anxiety over the possible outcome of the pregnancy. This has implication for counselling in order to reduce the feeling of guilt and anxiety. Pre-screening counselling is very important to help the individual understand the process and the possible options available.

Roles of midwives/ nurses in genetic Counselling

The midwife has important roles to play in genetic counselling if successful and positive pregnancy outcome will be achieved. To be effective counsellors' midwives must have up to date information about genetic counselling. The role of the nurse/ midwife as a genetic counsellor according to Skirton, Patch and Voelckel (2010) include the following:

- To identify the needs of the members of the family and using family-centred approach to give adequate counselling pertaining genetic problems that may be in the family line. This also involves provision of information on inheritance of genetic problems and how to control them (Skirton, Patch and Voelckel, 2010)
- To collect and analyze information involving history of the family and other relevant data for enabling the family to understand and acquire knowledge related to genetic counselling for couples and family at large (Skirton, Patch and Voelckel, 2010)
- To assist couples to gain the understanding of all aspects of genetic counselling and how to adapt to the health implications of genetic strategies to disease control (Skirton, Patch and Voelckel, 2010)
- To broaden and enhance knowledge of the family to enable them make informed choices and mental adjustment to the risk of, or actual genetic health issues (Skirton, Patch and Voelckel, 2010)
- To provide proficient information to motivate the couple to go for adequate healthcare services that cover the major needs of the family (Skirton, Patch and Voelckel, 2010)
- Recommendations for Preconception Care
- The recommendations for preconception care according to CDC (2014) are as follow;
- Health insurance schemes of different kinds should be made available and more accessible to all women of reproductive age to make it easy for them to experience an enhanced preconception care and inter conception care services.
- Increased public awareness of the benefits of preconception care should be made known to all people using appropriate strategies.
- There is need for reproductive life plan for everybody, both young and old.
- At least one pre-pregnancy visit should be made possible for all women, couples and families planning to have a child.
- Health care facilities should ensure that higher percentage of women of reproductive age and their partners are given follow up care.
- Preconception health care should be frequently monitored with strategic health surveillance.
- The period between pregnancies of women who experience unexpected poor obstetric outcome of the previous pregnancy should be carefully handled with consistent implementations of services that prepare them for safe delivery of their subsequent babies.
- There should be an assessment of risk factors for congenital anomaly among the women of reproductive age and their spouses, followed by series of information and counselling on health promotion activities to enhance childbirth outcomes.
- Healthcare professionals should ensure that elements of preconception healthcare are incorporated into other health interventions such as inter-conception services and primary and comprehensive health care for women of childbearing age with bad obstetric history.
- The implementation of the preconception health care should be based on evidence of proven and standard practice.

Implications for the Nursing/Midwifery Practice

Nurses must know the role genetics play on health and disease, and incorporate genetic questions into nursing care (Lea, 2002). Findings of a study reveal that nurses and other trained midwives are widely proficient and highly placed in passing genetic and genomic knowledge as a result of their experience in the field of human genetics and genomics (Gallup, 2007). Nurses and midwives require the literacy of this important field to meet the emotional and psychological needs of the clients thereby enhancing and maintaining stable health status before, during and after delivery of their babies. They should be able to discuss the implications and possible outcomes of pregnancy with the couple, and know the best time to seek an advanced help from the genetic specialist (Burton, Shuttleworth and Alison, 2003).

Advancement of technology and knowledge of genetics and genomics can be employed in handling genetic and chromosomal problems in order to achieve better birth experience. Jenkins, Grady and Collins (2005), in their study infer that “nurses and midwives are central in implementing information patterning to the physiology of all human genes in the body with the target of promoting positive health outcome for the mother, father, children and the entire family. Sequel to the immediate concern about nurses need for improved knowledge and skill in preconception care and genetics nursing profession should continue to focus on health and how to

improve it through supportive screening and preventive measures. More research on the areas of nurse's involvement in genetics and genomics and possible outcome should be studied and there is need to improve nursing curricula in the area of genetics and genomics.

Conclusion

This paper examined preconception care and genetic screening and counselling and how they help to decrease the occurrences of foetal anomalies, poor childbirth outcome and genetic abnormalities, since risk factors would have been noticed and proper counsel early enough. The paper concludes that preconception care is the care that a woman and her spouse receive prior to pregnancy in order to achieve good health for the mother and baby by the end of the pregnancy; while genetic counselling is a continuation of care usually given before genetic screening / test in order to prepare the couple emotionally and psychologically for the outcome of the screening and adequate support given to them.

The nurses and midwives must have basic and up to date information about preconception care, genetics and genomic in order to be able to give the required care and information to their clients. The midwife identifies families at risk, ensures they are properly counselled and support is given to them. When the care of couples is followed up from preconception care to prenatal genetic counselling and screening many medical conditions would be averted and as a result the mother's health is improved and the child is preserved. Therefore, there is need for nurses and midwives to rise up to the challenge of providing preconception care, prenatal genetic counselling and screening to their clients.

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