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Health Education Awareness On Genetic Reproductive Health Problems Among Women Of Reproductive Age In Delta State, Nigeria

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ABSTRACT

This study examined health education awareness of genetic reproductive health problems among women of reproductive age in Delta State, Nigeria. Reproductive health, which encompasses the ability to reproduce, freedom of reproductive choice, and access to appropriate information and services, is critical for the birth of healthy offspring. Genetic reproductive health problems, including sickle cell disease, Down syndrome, haemophilia, and Rhesus incompatibility, pose significant risks to maternal and child health. The study adopted a descriptive survey design, targeting 1,411,082 women aged 15–49 years, with a sample of 1,226 respondents selected through a multi-stage sampling technique. Data were collected using a validated questionnaire and analyzed using descriptive statistics and linear regression at a 0.05 significance level. Findings revealed a high level of knowledge of genetic reproductive health problems, specific genetic factors affecting marital compatibility, and the importance of personal genetic testing before marriage. Linear regression analyses indicated significant relationships between knowledge of genetic reproductive health problems, knowledge of specific genetic health factors, and knowledge and practice of personal genetic testing with the prevention of genetic reproductive health problems. The study concluded that health education plays a crucial role in enhancing awareness, promoting genetic screening, and reducing the incidence of genetic disorders. Recommendations include the provision of community genetic services, targeted health education campaigns, and early antenatal care to prevent birth defects.

Keywords: health education awareness, genetic testing, reproductive health problems

INTRODUCTION

All living organisms reproduce to ensure the continuity of life, either through asexual or sexual means. In humans, reproduction occurs sexually through the fusion of male and female gametes, resulting in fertilisation, pregnancy, and childbirth. Successful reproduction and the birth of healthy offspring depend on optimal biological, physiological, and genetic conditions, collectively referred to as reproductive health. Reproductive health is defined as a state of complete physical, mental, and social well-being in all matters relating to the reproductive system, and not merely the absence of disease or infirmity (World Health Organization [WHO], 2022). This concept encompasses the ability to reproduce, the freedom to make informed reproductive choices, and access to appropriate reproductive health information and services.

Women's reproductive health depends largely on the proper functioning of reproductive organs and the balanced regulation of hormones such as oestrogen and progesterone, which are essential for ovulation, menstruation, pregnancy, and breastfeeding (WHO, 2021). Disruptions in hormonal balance or the presence of reproductive disorders can negatively affect fertility, pregnancy outcomes, and overall maternal health. Hormonal and reproductive dysfunctions have been associated with infertility,

pregnancy complications, and increased maternal and neonatal risks (UNFPA, 2023). Among the major reproductive health challenges faced by women are genetic reproductive health problems, which arise from inherited genetic abnormalities. These include conditions such as sickle cell disease, Down syndrome, haemophilia, and Rhesus (Rh) incompatibility. Genetic disorders can reduce the likelihood of having healthy offspring and often place significant emotional, social, and economic burdens on families (Centers for Disease Control and Prevention [CDC], 2023). In sub-Saharan Africa, sickle cell disease remains one of the most prevalent inherited disorders, contributing substantially to maternal and child morbidity and mortality (Piel et al., 2021).

Knowledge and awareness play a critical role in the prevention and management of genetic reproductive health problems. Adequate understanding of genetic inheritance patterns, common genetic disorders, and preventive measures such as genetic screening and counselling enables women and couples to make informed reproductive decisions (WHO, 2022). Genetic screening before or during pregnancy has been shown to reduce the incidence of severe inherited disorders and improve pregnancy outcomes (ACOG, 2023). Health education is therefore essential in increasing awareness, shaping positive attitudes, and encouraging preventive practices related to genetic reproductive health. Educational interventions have been found to significantly improve knowledge and uptake of genetic screening services among women of reproductive age (Olawande et al., 2024). This study therefore focuses on health education and awareness of genetic reproductive health problems among women of reproductive age in Delta State, with the aim of promoting genetic screening, reducing the incidence of genetic disorders, and improving maternal and child health outcomes.

Research Questions

1. To what extent is the level of knowledge of genetic reproductive health problems and prevention of genetic reproductive health problems among reproductive women in Delta State?
2. To what extent would women in Delta State have knowledge of specific genetic health factors that may cause marriage incompatibility and prevention of genetic reproductive health problems between reproductive women and their spouses or suitors?
3. To what extent would women in Delta State have knowledge, practice of personal genetic tests before marriage and prevention of genetic reproductive health problems among reproductive women?

Hypotheses

1. There will be no significant relationship of the knowledge of genetic reproductive health problems and prevention about genetic reproductive health problems among reproductive women in Delta State.
2. There will be no significant relationship of the knowledge of specific genetic health factors that may cause marriage incompatibility and the prevention of genetic reproductive health problems between reproductive women and their spouses or suitors in Delta State.
3. There will be no significant relationship between knowledge, practice of personal genetic tests before marriage and the prevention of genetic reproductive health problems among reproductive women in Delta State.

Literature Review

Concept of Gene/DNA

Genes are the basic units of heredity located on chromosomes and are composed of deoxyribonucleic acid (DNA), which carries genetic instructions responsible for regulating cellular activities, organ functions, and overall body development. DNA directs the synthesis of proteins and enzymes that determine growth, development, and physical traits in humans (Alberts et al., 2022). Humans possess 46 chromosomes arranged in 23 pairs, inherited equally from both biological parents. Errors during cell division, such as trisomy or monosomy, may result in chromosomal abnormalities that contribute to genetic reproductive health problems, including Down syndrome and cystic fibrosis (Nussbaum, McInnes, & Willard, 2021). Evidence indicates that a significant proportion of reproductive health problems are genetic or chromosomal in origin, underscoring the crucial role of genes and DNA in human reproduction (WHO, 2022).

Knowledge of Reproductive Women about Down Syndrome

Research indicates that reproductive women generally have limited and sometimes inaccurate knowledge of Down syndrome (DS), with misconceptions often shaped by myths, cultural beliefs, and

inadequate access to accurate scientific information, particularly in African contexts (Adebayo & Oladimeji, 2021). While some women are aware of common DS characteristics such as distinctive facial features, chromosomal origin, and advanced maternal age as a risk factor, many hold incorrect beliefs about life expectancy, intellectual ability, independence, and educational inclusion of individuals with DS (Skotko, Kishnani, & Capone, 2022). Studies show that higher educational attainment, urban residence, and access to antenatal care are associated with better knowledge; however, substantial gaps persist regarding personal risk, prevalence, and long-term outcomes (Ahmed et al., 2023). Although prenatal screening has improved awareness in some settings, reliance on informal and unverified sources of information continues to fuel misunderstanding. These persistent gaps highlight the need for structured health education to reduce stigma, enhance informed decision-making, and promote prevention of Down syndrome and other genetic reproductive health problems.

Knowledge of Reproductive Women about Sickle Cell Disease

Studies reveal that although general awareness of sickle cell disease (SCD) among reproductive women is relatively high, detailed and accurate knowledge remains inadequate and is often distorted by misconceptions. Some women incorrectly attribute SCD to infections or spiritual causes, while many are unaware of their genotype or the hereditary nature of the disease (Olawande et al., 2022). Higher educational level is consistently associated with improved knowledge; however, utilisation of genetic counselling services remains low due to poor accessibility and limited awareness (Piel et al., 2021). Research further shows that many women do not fully recognise the importance of genotype compatibility testing in marital and reproductive decision-making, despite understanding that SCD can lead to severe pregnancy complications and reduced quality of life (WHO, 2023). These findings underscore the need for targeted health education to promote genotype awareness, premarital screening, and informed reproductive choices among women of reproductive age, particularly in Delta State.

Knowledge of Reproductive Women about Haemophilia

Evidence suggests that reproductive women possess moderate knowledge of haemophilia, especially regarding its symptoms and complications, but have limited understanding of its prevention and long-term management. While some women are aware of the role of genetic counselling and prenatal diagnosis in preventing haemophilia, the disorder remains underdiagnosed and undertreated in many developing countries (Srivastava et al., 2022). Studies demonstrate that early diagnosis, adequate information, and effective management significantly reduce complications and improve quality of life among affected families (CDC, 2023). Nonetheless, persistent knowledge gaps emphasise the need for sustained advocacy, awareness programmes, and comprehensive health education interventions to enhance understanding and reduce the incidence of haemophilia.

Knowledge of Reproductive Women about Rhesus Incompatibility

Research consistently shows poor knowledge of Rhesus (Rh) incompatibility among reproductive women. Many women do not perceive maternal–foetal blood incompatibility as a serious health concern, often due to ignorance, cultural beliefs, poverty, and limited access to healthcare services (Ekanem & Udoh, 2021). Studies report low awareness of personal Rh status and reluctance to undergo compatibility testing, with some women perceiving the procedure as unnecessary or embarrassing (Okeke et al., 2023). Despite evidence that African women face a higher risk of Rh incompatibility, knowledge gaps remain widespread. Financial constraints and the lack of comprehensive health insurance further restrict access to screening and information (UNFPA, 2022). These findings highlight the importance of health education in correcting misconceptions, improving awareness, and encouraging preventive practices related to Rh incompatibility.

METHODOLOGY

The study adopted a descriptive survey research design to systematically describe the knowledge and prevention of genetic reproductive health problems among women of reproductive age in Delta State and the role of health education. The population comprised 1,411,082 women aged 15–49 years, derived from projected population figures of Delta State, while a sample of 1,226 respondents was selected through a multi-stage sampling procedure involving random, proportionate, and purposive techniques across selected LGAs, communities, settlements, and households. Data were collected using a self-developed, validated, and reliable questionnaire (KPGRHP) structured on a four-point Likert-type scale, with established face, content, construct validity, and high reliability coefficients. Ethical approval and informed consent were duly obtained, and data collection was conducted through

household surveys with the assistance of trained research assistants. Data analysis involved descriptive statistics (mean and standard deviation) to answer research questions and linear regression to test hypotheses at a 0.05 level of significance, using benchmark means to determine levels of acceptance and extent.

RESULTS

Data Presentation

Research Question 1. *To what extent is the level of knowledge of genetic reproductive health problems among reproductive women in Delta State?*

Table 1: Mean and standard deviation on the level of knowledge of genetic reproductive health problems among reproductive women.

N = 1226						
S/N	Knowledge of Genetic Reproductive Health Problems	Mean	SD	Decision		
1.	I am aware that there is a problem of genetic reproductive health which is as a result of certain health deficiency in either of the couple	2.50	0.70	High		
2.	Some reproductive health problems are caused by some genetic factors inherited by either of the couple	2.43	1.14	Low		
3.	Sickle cell disease is a severe and complex inherited genetic disorder, most common in both genders	3.40	0.80	High		
4.	Genetic factor such as Down syndrome is the most common cause of intellectual disability of children	3.43	0.70	High		
5.	Mothers who carry the hemophilia genes are at risk for serious bleeding after delivery	3.00	0.78	High		
6.	There is a probability that the baby will be born with haemophilia if the mother has the condition	2.72	0.89	High		
Total Grand Mean		2.91				

Table 1, shows that items 1,3,4,5,6, with mean scores range of 2.50 – 3.43 and grand mean score of 2.91 were above the cut off point of 2.50, while the item 2 had a mean of 2.43 as low extent which was below the cut off point of 2.50. This revealed that there is high extent on the 5level of knowledge of genetic reproductive health problems among reproductive women in Delta State.

Research Question 2. *To what extent would women in Delta State have knowledge of specific genetic health factors that may cause marriage incompatibility between reproductive women and their spouses or suitors?*

Table 2: Mean and Standard deviation on knowledge of specific genetic health factors that may cause marriage incompatibility on reproductive women and their spouses or suitors.

N = 1226

S/N	Knowledge of Specific Genetic Health Factors	Mean	SD	Decision
7.	Congenital heart disease in both intended couples is associated with Down Syndrome, this is incompatible condition for them	1.69	0.68	Low
8.	Hearing as well as Vision problems are associated with Down Syndrome that could affect intended couples children with the condition	3.19	0.74	High
9.	Haemophilia is an inherited rare blood disorder that could make intended couples incompatible, if present in both of them	2.99	1.05	High
10.	High infant mortality is related to rhesus D negative pregnancy such as maternal-foetal blood incompatibility	1.82	0.76	Low
11.	Intended couples with sickle cell status in both are at increase risk of complications; as well as incompatible for marriage	2.95	0.92	High
Total Grand Mean		2.53		

The result in table 2, indicates that in items 7, and 10 had mean scores range of 1.69 - 1.82 as low extent while items 8, 9 and 11 had mean scores range of 2.95 - 3.19 as a high extent and total grand mean of 2.53 which is above the cut off point of 2.50. Hence, the result revealed high extent that women in Delta State have high knowledge of specific genetic health factors that may cause marriage incompatibility between reproductive women and their spouses or suitors.

Research Question 3. *To what extent would women in Delta State have the knowledge and practice of personal genetic tests before marriage to prevent genetic reproductive health problems among reproductive women?*

Table 3: Mean and Standard deviation on the knowledge and practice of personal genetic tests before marriage to prevent genetic reproductive health problems.

N = 1226

S/N	Knowledge and Practice of personal Genetic test before Marriage	Mean	SD	Decision
12.	Not going for Medical screening before marriage put reproductive women at risk of having children with genetic health defects	3.29	0.59	High
13.	Reproductive women should undergo medical screening before getting married so as to decide whom to marry	3.40	0.77	High
14.	It is necessary for reproductive women to undergo medical screening before getting married so as to find early solution to any reproductive health conditions	3.40	0.70	High
15.	Going for medical screening before marriage helps to reveal compatibility status of intended couples	3.05	0.78	High

16.	Reproductive women should practice medical screening before marriage, so as to save them from having children with genetic reproductive health problems	3.46	0.60	High
17.	Undergoing medical screening before marriage is necessary as it will help to detect any genetic problems with reproductive women	2.65	0.84	High
Total Grand Mean		3.21		

Table 3 shows that items 12 - 17 had mean scores range of 2.65 - 3.46 and a grand mean score of 3.21 which were above the cut off point of 2.50 as a high extent. The result indicates that there exist high extent women in Delta State have in the knowledge and practice of personal genetic tests before marriage to prevent genetic reproductive health problems among reproductive women.

Hypothesis 1

This is no significant relationship of the knowledge about genetic reproductive health problems and the prevention of genetic health problems among reproductive women in Delta State.

Table 4: Linear regression analysis on the knowledge about genetic reproductive health problems and the prevention of genetic health problems among reproductive women.

Model	Sum of Square	Df	Mean Square	F	Sig.
Regression	20.933	1	20.933	6.242	0.013 ^b
Residual	4104.621	1224	3.353		
Total	4125.554	1225			

Coefficients					
Unstandardised Coefficients			Standardised Coefficients		
	B	Std. Error	Beta	t	Sig
(Constant)	16.237	0.477		34.052	0.000
Knowledge of Genetic Reproductive Health Problems	-0.066	0.026	-0.071	-2.498	0.013

$\alpha = 0.05$; $R = 0.071$; $R \text{ Square} = 0.005$

a. Dependent Variable: Prevention of genetic Reproductive Health problems.

b. Predictors: (Constant), Knowledge of Genetic Reproductive Health Problems.

Table 4 shows the F – value of 6.242 and a p –value of 0.013. Testing the null hypothesis at an alpha level of 0.05, the p –value of 0.013 was less than the alpha level of 0.05. Therefore, the null hypothesis which states that “there is no significant relationship of the knowledge about genetic reproductive health problems and the prevention of genetic health problems among reproductive women in Delta State” was rejected. That is to show that there was significant relationship of the knowledge about genetic reproductive health problems and the prevention of genetic reproductive women in Delta State. The unstandardised coefficient (B) for predicting the prevention of genetic health problems among reproductive women from the knowledge about genetic reproductive health problems was -0.066 and the standardised coefficient (Beta) was -0.071, $t = 0.013$. Hence, the Knowledge about genetic reproductive health problems was significant at an alpha level of 0.05.

Hypothesis 2

There is no significant relationship of the knowledge of specific genetic health factors that may cause marriage incompatibility between reproductive women and their spouses or suitors and the prevention of genetic health problems among reproductive women in Delta State.

Table 5: Linear regression analysis on the knowledge of specific genetic health factors that may cause marriage incompatibility between reproductive women and their suitors or spouses and the prevention of genetic health problems among reproductive women.

Model	Sum of Square	Df	Mean Square	F	Sig.
Regression	237.730	1	237.730	74.844	0.000 ^b
Residual	3887.823	1224	3.176		
Total	4125.554	1225			

Unstandardized Coefficients			Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	18.067	0.352		51.317	0.000
Knowledge of Specific Genetic Health Factors	-0.239	0.028	-0.240	-8.651	0.000

$\alpha = 0.05$; $R = 0.240$; $R \text{ Square} = 0.058$

a. Dependent Variable: Prevention of genetic Reproductive Health problems.

b. Predictors: (Constant), Knowledge of specific Genetic Reproductive Health factors

The result in the table 5 shows the F-value of 74.844 and a p-value of 0.000. Testing the null hypothesis at an alpha level of 0.05, the p-value of 0.000 was less than the alpha level of 0.05. Thus, the null hypothesis which states that “there is no significant relationship of the knowledge of specific genetic health factors that may cause marriage incompatibility between reproductive women and their spouses or suitors and that prevention of genetic health problems among reproductive women in Delta State” was rejected.

The unstandardized coefficient (B) for predicting the prevention of genetic health problem among reproductive women from the knowledge of specific genetic health factors that may cause marriage incompatibility between reproductive women and their spouses or suitors was -0.239 and the standardized coefficient (Beta) was -0.240. Therefore, the knowledge of specific genetic health factors that may cause marriage incompatibility between reproductive women and their spouses or suitors was significant at an alpha level of 0.05.

Hypothesis 3

There is no significant relationship between knowledge and practice of personal genetic tests before marriage and prevention of genetic reproductive health problems among reproductive women in Delta State.

Table 6: Linear regression analysis on the knowledge and practice of personal genetic test before marriage and prevention of genetic reproductive health problems among reproductive women.

Model	Sum of Square	Df	Mean Square	F	Sig.
Regression	135.314	1	135.314	41.507	0.00 ^b
Residual	3990.240	1224	3.260		
Total	4125.554	1225			

Unstandardized Coefficients		Standardized Coefficients			
	B	Std. Error	Beta	T	Sig.
(Constant)	18.142	0.482		37.625	0.000
Knowledge and Personal Genetic Test before Marriage	-0.160	0.025	-0.181	-6.443	0.000

$\alpha = 0.05$; $R = 0.181$; $R \text{ Square} = 0.033$

a. Dependent Variable: Prevention of genetic Reproductive Health problems.

b. Predictors: (Constant), Knowledge and practice of Personal Genetic Tests before marriage.

In table 6, the F – value of 41.507 and a p – value of 0.000. Testing the null hypothesis at an alpha level of 0.05, the p-value of 0.000 was less than the alpha level of 0.05. Thus, the null hypothesis was rejected. This revealed that there was significant relationship between knowledge and personal genetic tests before marriage and prevention of genetic reproductive health problems among reproductive women in Delta State.

The unstandardised coefficient (B) for predicting the knowledge and practice of personal genetic tests before marriage was - 0.160 and the standardized coefficient (Beta) was - 0.181, $t = -6.443$. Thus, knowledge and practice of personal genetic tests before marriage among reproductive women was significant. The unstandardized coefficient (B) for predicting the prevention of genetic health problem among reproductive women from knowledge and practice of personal genetic tests before marriage among reproductive women was 0.160 and the standardized coefficient (Beta) was - 0.181. Therefore, knowledge and practice of personal genetic test before marriage among reproductive women was significant at an alpha level of 0.05.

DISCUSSION OF RESULTS

The findings of the results were discussed under the following subheadings:

Knowledge of Genetic Reproductive Health Problems

Findings from research question one, as presented in Table 4.1, revealed a high extent of knowledge of genetic reproductive health problems among reproductive women in Delta State. This conclusion was drawn from the mean scores of items 1, 3, 4, 5, and 6, which ranged between 2.50 and 3.43, with a grand mean score of 2.91. These values were above the cut-off point of 2.50, indicating a generally high level of knowledge among the respondents. This implies that reproductive women in Delta State possess appreciable awareness and understanding of genetic reproductive health problems. The result of hypothesis one further revealed a significant relationship between knowledge of genetic reproductive health problems and the prevention of such problems among reproductive women. This finding aligns with the study of Denise et al. (2012), who reported that reproductive women had some knowledge of Down syndrome, particularly in recognizing facial features, although misconceptions existed regarding life expectancy, maternal and paternal risk factors, and the belief that raising a child with Down syndrome would significantly disrupt family life. Similarly, the present finding is consistent with Garcia

et al. (2021), who observed that reproductive women in urban areas demonstrated general awareness that children with Down syndrome may require specialized interventions such as physical, speech, occupational, and behavioural therapies.

Knowledge of Specific Genetic Health Factors

Results from research question two, as shown in Table 4.2, indicated a high extent of knowledge among reproductive women in Delta State regarding specific genetic health factors that may cause marriage incompatibility. Although items 7 and 10 recorded low mean scores ranging from 1.69 to 1.82, items 8, 9, and 11 recorded high mean scores between 2.95 and 3.19. The overall grand mean score of 2.53 exceeded the cut-off point of 2.50, indicating that respondents generally possessed substantial knowledge of genetic factors related to marital compatibility. Hypothesis two revealed a significant relationship between knowledge of specific genetic health factors that may cause marriage incompatibility and the prevention of genetic health problems among reproductive women in Delta State. This finding contradicts the study of Ejimofor (2023), who reported poor knowledge of rhesus incompatibility among reproductive women in Nigeria, noting that many women were unaware of their rhesus status before marriage, leading to complications during pregnancy and unsafe abortions. However, the present finding agrees with Drelich et al. (2017), who reported a moderate level of knowledge among reproductive women in Lagos regarding the symptoms, complications, and prevention of haemophilia. Conversely, the result does not support the findings of Oluwole et al. (2022), who reported that less than half of young prospective couples in an urban Lagos community knew their haemoglobin genotype, with most tests conducted for school entry rather than marital compatibility. This finding is also at variance with Isah et al. (2016), whose respondents reported high awareness of their haemoglobin genotypes, with a majority identifying as Hb AA.

Knowledge and Practice of Personal Genetic Tests before Marriage

Findings from research question three, as presented in Table 4.3, showed a high extent of practice of personal genetic testing before marriage among reproductive women. The mean scores of items 12–17 ranged from 2.65 to 3.14, with a grand mean score of 3.21, all exceeding the cut-off point of 2.50. This suggests that reproductive women in Delta State actively engage in genetic testing as a preventive measure against genetic reproductive health problems. Hypothesis three further revealed a significant relationship between knowledge and practice of personal genetic tests before marriage and the prevention of genetic reproductive health problems. This finding is consistent with Ogamba et al. (2021), who reported high levels of genetic knowledge among pregnant women attending antenatal clinics in Lagos. Their study showed that most respondents understood basic genetic concepts, including inheritance patterns, non-infectious causes of genetic diseases, and the hereditary nature of sickle cell disease. Additionally, Ogamba et al. (2021) found that a majority of respondents were willing to undergo genetic testing, with education being the only significant factor associated with willingness to test. The present finding also agrees with Itaa and Willy (2024), who reported high levels of knowledge, positive attitudes, and preventive practices regarding rhesus incompatibility among reproductive women in Port Harcourt. Most respondents affirmed the importance of knowing one's blood group and rhesus factor before marriage and expressed readiness to undergo testing. However, this finding contradicts Kio et al. (2016), who reported that only 42% of women had practiced maternal–foetal blood incompatibility testing. Furthermore, the finding supports Isah et al. (2016), who demonstrated that health education significantly improved knowledge, attitudes, and screening uptake for sickle cell disease among female youth corps members in Lagos.

CONCLUSION

Based on the findings, the following conclusions were drawn: The study revealed that knowledge about genetic reproductive health problems, knowledge of specific genetic factors that may cause marriage incompatibility between reproductive women and their spouses or suitors, knowledge and practice of personal genetic tests before marriage, knowledge of sources of information on genetic reproductive health problems, health education as a means of bringing about positive change in their knowledge of genetic reproductive health problems were very important for the improvement of women of reproductive age (15–49 years). While knowledge, practice of genetic tests together with their suitors or spouses before marriage, perception about educating their spouses or suitors on genetic reproductive health problems and the practice of genetic health screening before marriage should be taken seriously for any intending couples that want to get married.

RECOMMENDATIONS

In light of the findings, the following recommendations were made:

1. Government and other stakeholders in the health sector should provide comprehensive Community Genetic Services to promote the health and wellbeing of all citizen, not only women of child bearing age, thereby reducing morbidity and mortality rates associated with genetic reproductive health problems
2. Enlightenment campaigns should be carried out by the Ministry of Health to educate reproductive women about the effects of genetic reproductive health problems.
3. Pregnant women should visit antenatal clinic early so that they can be given advised by health personnel not to take unprescribed drugs during pregnancy but prescribed ones to prevent birth deformity.

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