



# Mentality towards early hereditary screening among understudies of Osun State Polytechnics in Nigeria

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Abstract

This study investigated the attitude towards pre-marital genetic screening among students of Osun State Polytechnics. Descriptive survey design was used for the study. The instrument for data collection was self developed and structured questionnaire in four- point likert scale format. Descriptive statistics of frequency count and percentages were used to describe the demographic data, while the parametric statistics of t-test and ANOVA set at 0.05 alpha level were used to test the hypotheses. A total number of one thousand, one hundred and sixty-five (1,165) Higher National Diploma (HND) students served as respondents for the study. Multistage sampling technique was used in three stages to select the respondents, namely: purposive sampling technique was used to select the schools; stratified sampling technique was used to select the Faculties and Departments, while proportionate sample of 25% was selected from each stratum. Three hypotheses were formulated to guide the study. The following were the values obtained: Difference in Attitude towards Pre-marital Genetic Screening (Crit-t = 1.96, Cal.t = 1.310, df = 1163, P>.05); Difference in Attitude Due to Religion (F(2,1162) = .689, P>.05) and Difference in Attitude Due to Course of Study (F(5,1159) = .585, P>.05). Conclusions were drawn based on the findings of the study. The study recommended, among other things, that religious organizations should serve as useful channels to disseminate health information since people always have respect for places of worship and religious leaders. Also, Health Education should be incorporated into the curriculum of Polytechnics.

**Keywords:** Attitude, pre-marital, polytechnics, genetic disorders, screening, blood group.

## INTRODUCTION

Genetic diseases are hereditary in nature. Deoxyribonucleic Acid (DNA) is responsible for heredity in humans. DNA characteristically condenses to form chromosomes. There are 46 chromosomes in the nucleus of human cells arranged in 23 pairs. Each of the pairs consists of a chromosome of paternal origin and one of maternal origin. Each chromosome is made up of genes. Gene or set of genes control traits. The presence of defective gene in either parent and the probability of its transmission to the children can only be accessed through genetic testing. Therefore, information about

couple's predisposition to certain disease and the likelihood of passing on those diseases to their unborn children is necessary before marriage is consummated.

According to Mehta (2011) genetic disorder is an abnormal condition that a person inherits through genes or chromosomes. He further said that some genetic disorders are caused by mutations in the DNA of genes while other disorders are caused by changes in the overall structure or number of chromosomes. Genetic disorders runs in blood and this accounted for why if one parent has a genetic related disease, it is very likely that

50 percent of his or her children also will develop the disease.

Ahmed (2010) stated that genetic disorders and congenital abnormalities occur in about 2%-5% of all live births, account for up to 30% of paediatric hospital admissions and cause about 50% of childhood deaths in industrialized countries. Similarly, Memish and Saeedi (2011) noted that genetic disease affects as much as 5% of the world's population constituting a major public health problem in many parts of the world. Genetic disease impact academic achievement negatively as poor health condition resulting from the disease will not allow the affected children to participate in school work.

WHO (1999) described pre-marital genetic screening as services targeted at individuals and families which try to enable people with a genetic disadvantage, and their families to live and reproduce as normally as possible, assuring access to relevant medical services (diagnostic, therapeutic, counseling, rehabilitative and preventive) and social support systems, helping them to adapt to their unique situation and providing information to enable educated and voluntary choices in health and reproductive matters. Pre-marital genetic screening can identify and modify behavioural, medical and other health risk factors known to impact pregnancy outcomes through prevention and management (Chunang and Chen, 2008). It is capable of reducing the burden that birth defects and genetic disorders impose on most people.

According to Abd-Al-Azeem et al. (2011) pre-marital screening is mainly aimed at reducing the number of children with inherited diseases. It is a comprehensive group of tests for those who are planning to get married and highly beneficial for the couples who are under the following categories:

- Couples going for consanguineous marriage.
- If either/both have family history of a serious genetic condition.
- If they are carriers of the same faulty gene.
- If they have exposure to some chemical or other environmental agent.
- Any abnormalities in the chromosomes.

Rogan (2011) opined that objectives of pre-marital genetic screening includes: early recognition of disorder for intervention that prevents or reverses the disease process; or to ensure optimal management of the patient, that is, appropriate referrals to specialists when symptoms are anticipated and, informed reproductive decisions or disease management. El-Hazmi and Warsy (2004) classified the objectives of pre-marital genetic screening into two, viz: primary objective of identifying carriers among prospective couples to enable carriers to be better informed about genetic risks and reproductive options, and secondary objective of prevention of

morbidity due to genetic disease and alleviation of the suffering that this would impose.

Genetic screening is a public health initiative that has been used interchangeably with genetic testing. Testing implies genetic test done on an individual basis while screening implies large scale. Mainly to alert couples with potential health risks for their future offspring. Genetic testing (also called DNA based tests) is used to test for genetic disorders which involve direct examination of the DNA molecule itself. It allows for genetic diagnosis of those who are vulnerable to inherited diseases. The test could be performed at designated marriage consultation centres by doing simple blood test. The blood taken from couple is used to do such test as Complete Blood Count (CBC), sickle cell test, haemoglobin electrophoresis in addition to screening for HIV, Hepatitis B and C viruses. Genetic testing can be used to test for genetic disorder which may include genetic disorder such as sickle cell anaemia, cystic fibrosis, spinal muscular atrophy, mental retardation, epilepsy and Down syndrome.

According to Ibrahim, Al-Bar et al. (2011), it is apparent that the vast majority of students (99, 96.7 and 99.4%) strongly agreed on the importance of pre-marital screening program, and that it should be used to reduce some genetic and sexually transmitted diseases and raise awareness about pre-marital screening before marriage, respectively. They further noted that the majority of them disagreed or strongly disagreed (90.9%) with the misconception that pre-marital screening is against Islamic rules while about two-thirds of students (67.1%) strongly agreed that test results which show presence of genetic diseases should change marriage decision while 44.8% strongly disagreed that no one should compel any person to conduct genetic testing. Their result also showed that 64.6% strongly agreed that the presence or risk of disease should not compel a change in the decision to marry but should be left to the will of the couple.

Attitude is a psychological construct which expresses one's disposition towards an issue. One's behavior can be inferred from his or her disposition to situations. In other words, knowledge about an issue determines attitude towards it which in turn influence the behavior. Al Sulaiman et al. (2008) found that there was positive attitude of Saudi population towards pre-marital screening and the majority of participants agreed that the program should apply to all couples in all regions of Saudi Arabia. Result of the study by Black and Meyer (2009) showed that there was an overall positive attitude toward genetic testing among the respondents aged 14-95 years of German sample. Also, Hassan et al. (2001) reported that 80.9% of medical students in Alexandria, Egypt, supported the idea of pre-marital examinations. Similar results of a study to assess the attitude of Pakistani doctors, medical students, lawyers, parliament members and parents of Thalassaemic children towards

genetic diagnosis found that pre-marital carrier screening was favored by 77% of the respondents (Gilani et al., 2007).

According to Al-Khalidi et al. (2002), the results of a study conducted to explore the attitude of the students of Health Sciences College in Abha, towards pre-marital genetic screening illustrated that 70% of the participants accepted it. The Alexandria study conducted among nursing students showed that 65.5% of them had a positive attitude towards premarital counseling (Mitwally and Abd El-Rahman, 2000). On the other hand, the Syrian study reported that although students had some positive attitude, they still had negative attitude and perceptions towards other aspects of pre-marital screening programme (Gharaibeh and Mater, 2009).

According to Balck and Meyer (2009), results of a study reported in 2010 from King Abdul-Aziz University found that most of the students favor the pre-marital screening program but there were concerns regarding mandating the testing and interference with individual decision making. Hassan et al. (2001) reported that the majority of medical students emphasized the free choice of the partners regarding finalizing the marriage whatever the results of pre-marital screening and less than one third had a positive attitude towards the results. In Nigeria, Polytechnic programme is geared towards providing full-time and part-time courses of instruction and training in Applied Sciences, Engineering, Business and Management leading to the production of trained manpower. Polytechnic maintains a two-tier programme of studies, viz: the Ordinary National Diploma (OND) and Higher National Diploma (HND) with one year period of industrial experience serving as one of the pre-requisites for entry into the HND programmes (NERDC, 2004).

Healthy manpower is vital to national development. Nigeria is a developing country yearning for development. The health and wellbeing of polytechnic students who are potential manpower of the nation should be of great concern. Therefore, this study was designed to find out the attitude of students of Osun State Polytechnics towards pre-marital genetic screening.

### **Statement of the problem**

Egbochukwu and Imogie (2002) stated that Nigeria has the highest number of sickle cell disease sufferers (a genetic disease) in the world with prevalence found to be 10 persons with sickle cell disease per 1,000 population or 2%. Ehigie (1988) carried out a research on knowledge and attitude towards genetic screening for sickle cell disease among secondary school students in Kwara State, Nigeria. The pretest obtained by the students indicated a low level of awareness about sickle cell disease. This is despite the fact that some of them have been exposed to health-related subjects. Therefore,

attitude towards pre-marital genetic screening among polytechnic students where health education is not offered as a course may generate some concern. Most Higher National Diploma students of polytechnics have already attained marriage age; obviously they would want to go into marriage after their academic programmes. Abd-Al-Azeem et. al. (2011) said that pre-marital genetic screening is a comprehensive group of tests highly necessary for those who are planning to get married, hence, the need for positive attitude towards this life determining issue. It is on this premise that this study examined the attitude towards pre-marital genetic screening among students of Osun State Polytechnics.

### **Hypotheses**

H<sub>1</sub>: There will be no significant difference in positive attitude towards pre-marital genetic screening between students of the two Osun State Polytechnics.

H<sub>2</sub>: There will be no significant difference in the attitude towards pre-marital genetic screening due to religion among students of Osun State Polytechnics.

H<sub>3</sub>: There will be no significant difference in the attitude towards pre-marital genetic screening due to course of study among students of Osun State Polytechnics.

### **METHODOLOGY**

The purpose of this study was to examine the attitude towards pre-marital genetic screening among students of Osun State Polytechnics. The descriptive survey research design was used for this study. It was considered appropriate because according to Best and Kahn (2003), descriptive survey is concerned with the condition and relationship which exists, practices that prevail, point of view or attitude that are held, effects that are being felt, processes that are going on or trend that are developing. The population for this study comprised of all students of Osun State polytechnics. The sample for this study was one thousand, one hundred and sixty-five (1,165) respondents drawn from Osun state polytechnics. Osun state polytechnics are two, viz: Osun State College of Technology, Esa-Oke and Osun State Polytechnic, Iree. Multistage sampling technique was used to select respondents in the following order: stratified sampling technique was used to select the faculties and departments; purposive sampling technique was used to select Higher National Diploma students; while proportionate sample of 25% of the total population was selected from each stratum (department) using simple random sampling technique.

### **Instrumentation**

The instrument used for this study was self developed questionnaire of Students' Attitude towards Pre-marital Genetic Screening Questionnaire (APGSQ) designed according to variable tested in the hypotheses, using four-point likert scale format. To establish the reliability of this instrument, the collected data from pre-testing was subjected to Crombach Alpha Correlation Coefficient to find its reliability. Following this, 0.76 was obtained as the reliability value for this scale.

**Table 1.** T-test table showing difference in attitude

Attitude	N	Mean	Std. Dev	P
OSCOTECH, Esa-Oke	435	36.90	5.61	.190
Polytechnic, Iree	730	36.50	5.61	

(Crit-t = 1.96, Cal.t = 1.310, df = 1163, P > .05 level of significance). The null hypothesis is accepted.

**Table 2.** ANOVA table showing difference in attitude due to religion

Source	Sum of squares	Df	Mean square	F	Sig.
Main Effect	23.501	2	11.750	.372	.689
Religion	23.501	2	11.750	.372	.689
Residual	36679.045	1162	31.565		
<b>Total</b>	<b>36702.546</b>	<b>1164</b>			

(F(2,1162) = .689, P > .05).

**Table 3.** ANOVA table showing difference in attitude due to course of study

Source	Sum of Squares	Df	Mean Square	F	Sig.
Main Effect	92.439	5	18.488	.585	.711
Religion	92.439	5	18.488	.585	.711
Residual	36679.045	1159	31.565		
<b>Total</b>	<b>36702.546</b>	<b>1164</b>			

(F(5,1159) = .585, P > .05).

## RESULT

**Hypothesis 1:** There will be no significant difference in positive attitude towards pre-marital genetic screening between students in the two Osun State Polytechnics.

Table 1 showed that the calculated t value is 1.310, while the table value is 1.96 and the degree of freedom is 1163. Since significant P (.190) > 0.05, the hypothesis that said there will be no significant difference in positive attitude towards pre-marital genetic screening between students of the two Osun State Polytechnics is hereby accepted. This implies that there was no significant difference in positive attitude towards pre-marital genetic screening between students of the two Osun State Polytechnics.

**Hypothesis 2:** There will be no significant difference in the attitude towards pre-marital genetic screening due to religion among students of Osun State Polytechnics.

In the ANOVA table above (Table 2), it was observed that there was no significant difference in the attitude towards pre-marital genetic screening due to religion among students of Osun State Polytechnics (F(2,1162) = .689, P > .05). Hence, the hypothesis that said there will be no significant difference in the attitude towards pre-marital genetic screening due to religion among students

of Osun State Polytechnics was accepted. This implies that there was no significant difference in attitude towards pre-marital genetic screening due to religion among students of Osun State Polytechnics.

**Hypothesis 3:** There will be no significant difference in the attitude towards pre-marital genetic screening due to course of study among students of Osun State Polytechnics.

In the ANOVA table above (Table 3), it was found that there was no significant difference in the attitude towards pre-marital genetic screening due to course of study among students of Osun State polytechnics (F(5,1159) = .585, P > .05). Hence, the hypothesis that said there will be no significant difference due to course of study on the attitude towards pre-marital genetic screening among students of Osun State Polytechnics was accepted. This implies that there was no significant difference in the attitude towards pre-marital genetic screening among students of Osun State Polytechnics due to course of study.

## DISCUSSION

**Hypothesis 1:** The result of the study showed that there

was no significant difference in the attitude to pre-marital genetic screening between students of OSCOTECH, Esa-Oke and students of Osun State Polytechnic, Iree. This finding is in line with that of Al-Aama (2010) whose study found no significant difference in the attitude of students towards pre-marital screening for hereditary hemolytic between schools. Although each of the polytechnic is autonomous, there are similarities in mode of admission; courses of study and mandate. This may have contributed to the finding.

**Hypothesis 2:** The result of this study revealed that there was no significant difference in the attitude towards pre-marital genetic screening due to religion among students of Osun State Polytechnics. This finding is in line with that of Arulogun and Adefioye (2010) which showed that religion had no significant relationship with the attitude of unmarried youths of Ibadan Northwest Local Government area towards pre-marital HIV screening. However, reports from three different Islamic countries by Karimi et al. (2007); Monaghan (2007) AlKhaldi et al. (2002) provided evidence that religious beliefs could be obstacles to the success of pre-marital screening programmes, regardless of other factors such as education level.

The same conclusions were reported long ago in other (non-Muslim) communities by Angastiniotis and Hadjiminias stated (1981) that support from the Church was the main reason for the success of screening programmes in Cyprus and Greece. According to them, religious beliefs restrict the success of screening programmes in some communities. In Southern Iran, pre-marital screening had been mandatory for 10 years, yet high-risk couples still get married and give birth to children with homozygous for beta-thalassaemia, and often, this is because of religious and traditional or cultural restraints (Karimi et al., 2007). They further stated that in the case of Islam, consanguineous marriages are permitted, so thalassaemia persists in some parts of the community, making the programme redundant. Some people believe that their fate is determined by God and therefore accept the risk of having a sick child. A recent report in The Jordan Times showed that many Jordanians view the results of their unions as fate (Monaghan, 2007).

**Hypothesis 3:** The result of this study showed that there was no significant difference in the attitude towards pre-marital genetic screening due to course of study among students of Osun State Polytechnics. This finding was supported by that of Awatif (2006) which studied attitudes among female students in King Saud University and discovered that 86% of them, irrespective of course of study felt positively about pre-marital screening. Similarly, El-Hazmi (2006) assessed attitudes in a community-based study and found that 94% of participants considered pre-marital screening and counseling to be important in preventing genetic blood diseases; 87%

thought testing should be mandatory. Also, Al-Khaldi et al. (2002) evaluated the attitude of health-science students in Saudi Arabia towards premarital screening and counseling and found out that most students had a positive attitude.

Furthermore, Ibrahim et al. (2011) stated that the difference in the result of their educational program about pre-marital screening for unmarried female students in King Abdul-Aziz University, Jeddah, and a study done in Alexandria to assess knowledge and attitude of nursing students towards pre-marital counseling may be because Alexandria's study was done among nursing students only, with some background about the program, while the other study was done among students from all faculties. Conversely, Meilleur et al. (2011) in a study on genetic testing and counseling for hereditary neurological diseases in Mali found out that studying biology was the only predictor of high knowledge score. Similarly, Ibrahim et al. (2011) observed that being a health science student was the first predictor of high knowledge score.

## CONCLUSIONS

Based on the findings of these researchers, the following conclusions were drawn:

1. There is also no difference between the attitude of the students of Osun state Polytechnic, Iree towards pre-marital genetic screening and that of the students of Osun State College of Technology, Esa-Oke.
2. The attitude of students of Osun State Polytechnics towards pre-marital genetic screening is nearly the same, regardless of their religion affiliation.
3. The attitude of students of Osun State Polytechnics towards pre-marital genetic screening was not determined by the course they studied.

## RECOMMENDATIONS

Based on the findings of these researchers, the following recommendations were made:

1. Involvement of community leaders and non-governmental organizations in counseling programs to youth to raise awareness and change their attitude toward marriage between genetically incompatible partners.
2. Religious organizations can serve as useful channel to disseminate this health information since people always have reference for places of worship and for religious leaders.
3. Ethical principles of justice, autonomy, confidentiality, beneficence and respect for the dignity and basic intelligence of persons should be adhered to because this

will go a long way in helping people to embrace pre-marital genetic screening without any reservation.

4. Educational messages on this topic should be simple, explicit but understandable and presented in a manner that does not cause confusion.

The present drive to encourage the teaching of Health Education in Polytechnics should be sustained.

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