Accessing Genetic Information Services for family and Child Sustainability among Undergraduates in Benue State

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Abstract
This study examines Accessing Genetic Information Services for Family and Child Sustainability among undergraduates in Benue State. Two research questions and two hypotheses were postulated to guide the study. A self-developed questionnaire, Accessing Genetic Information Services (AGIS) was used to collect data from 379 respondents. The data collected was analyzed using percentages and chi-square. The results showed that undergraduates are not aware of genetic counselling services, those that visit the counselling unit only discuss academic issues. Some attested that discussion with a counsellor will not affect their spouse selection. Based on these findings, the researchers recommended that counselling units in tertiary institutions should carry out orientation of fresh undergraduates through which their services would be promoted. Free blood and genotype tests should be conducted on students in the institution’s health centers to enable students know their blood groups. This will go a long way to help them make wise choices.

Key words: Accessing, Genetic, Counselling, Undergraduates and Sustainability.

Introduction
The beginning of human life starts with one spermatozoon (male gamete) fertilizing or uniting with an egg (female gamete), which then develops in the uterus to a full term baby. The offspring inherits some characteristics like skin colour, nose contour, and physical appearance, and height, colour of eyes, texture and colour of the hair. The chromosomes contain the genes, which carry all these traits, which are transmitted to the offspring. The male and female gametes each contain 23 chromosomes making it a total of 46 chromosomes, 44 are of identical strands and make-up 22 pairs of chromosomes called autosomes. The other 2 non-identical are sex chromosomes, the one from the maternal genetic material is designated as the X-chromosomes and the one from male material is designated as the Y-chromosomes.

According to Ebrahim (1981), more than 200 single gene disorders have been discovered. These disorders are of three classes and are due to chromosomal abnormality, which are: Autosomal dominant, recessive and sex-linked. He further attested that at any given time, the individual is a product of the continuing interaction between his genetic endowments and the environment. Similarly, differences which occur in individuals during health and illness are dependent upon the varying proportions contributed by the genetic inheritance on one hand and the environmental factors on other hand. Thus, a genetic component can be identified in every disease including those illnesses, which are pre-dominantly determined by the environment such as measels.

Until recently, there was no evidence as
to how hereditary characteristics are transmitted. For example, it was sometimes thought that in human beings, the soul or spirit of a recently deceased relative was reincarnated in a newly born child. Through the work of an Australian Monk, Gregor Mendel (1856), who lived about one hundred years ago, we now know that such explanations are incorrect.

In Nigeria and Benue State in particular, the health sector budgets heavy amounts of money on health projects, yet not much is felt in the area of family sustainability health and genetics. Many children die as a result of sickle cell anemia, and many couples cannot live together happily and produce live-healthy babies because of Rhesus incompatibility and still, many divorce cases are recorded because of the reproduction of children of the same sex. Many women, because of academic pursuit, go into marriage late and produce children at an age, which is medically considered “high risk” in child bearing. As a result, they reproduce children with genetic abnormalities such as Down’s syndrome (trisomy 21), also marriages are contracted without reference to a specialist on issues of genetics.

It is on this background, that the writers consider the need for accessing genetic information as a supportive service for pre-marital and marital counselling for family and child sustainability. Accessing genetic information services can be viewed at three levels. First awareness must be created that counselling unit exist on campuses where information services are provided on understanding family relation, secondly, instead of relying on churches, newspapers columnist or babalawos for counselling which most at times are done by untrained persons, the school counsellor must create awareness about their availability and the services provided. The third level aims at helping students make wise choices in respect to their spouses selection. As Okon (1984) points out, information services are not only designed to help students about their educational and occupational opportunities but are also aimed at assisting them with self understanding and adjustment to home conditions, family members and parental expectations

In the traditional Nigerian society, and Benue State in particular, even though genetic information was not formerly sought before marriage, certain behaviours and decisions taken by some families showed that the society was not completely ignorant about the role genetic factors played in their lives. For instance, certain qualities like honesty, hard-work, wisdom, faithfulness, chastity, obedience, height and beauty were attributed to families and were given consideration before a choice of spouse was made. Similarly, they did not understand the role chromosomes played in heredity, but realized that some diseases or disorders run in families and as such, this was sometimes used by such families to make necessary inquiries into the matter of marriage. Marriage to relations like cousins was also highly prohibited for similar reasons.

Nwachukwu (1994) asserts that children born disabled in the Nigerian society are perceived as sub-human. They often suffer public resentment and suffer a lot from feelings of anger, shame, fear and frustration. In some parts of Africa before the pre-Christian era, both mother and child were killed for defiling the land and when spared, purification rites were performed by the priest to appease the anger of the gods on behalf of the woman who had defiled the sacred lineage.

New techniques in molecular biology and biochemistry appear almost daily that advance the understanding of human genetics and development. Molecular approaches to the clinical problems now support reverse genetics. The characteristic of human disorder at the level of the gene before their clinical biochemistry and physiology is described worldwide. Scientists have united
to mark out the human genome. These advances have paved the way for a better understanding of the dysmorphology and teratology. There have been more advances in the diagnosis and therapeutic application of recombinant DNA technology, (Edington & Gilles (1976). Congenital malfunction according to Nwachukwu (1994), are the largest and single causes of illness and death during childhood.

In Benue state of Nigeria, statistics available at the records department of the Federal Medical Centre, Makurdi reveal that one of the commonest genetic problems encountered in children is the sickle cell disease. Sickle cell disease is a recessive disorder inherited from parents who carry the gene. Sickle cell cannot at present, be cured, it can only be managed. Those who have it suffer for life. When a sickler gets to an advanced stage of the disease, the person feels a sense of separation and loss from others. Such a child often shifts the blame to the parents.

Although no research has been conducted in this area in Benue State, the presence of this problem is evident among us and affects us. The undergraduate student needs to have an insight in preparation for sex and marriage. And if the family institution is to be sustained then all hands must be on deck to eliminate possible causes of family instability. It is on this note that genetic counseling is primarily considered appropriate at preventing problems rather than solving them. Genetic counseling is viewed by Kelly, (1998) as an educational process that seeks to assist affected individuals and other individuals at risk of getting an inherited condition to understand the nature of the genetic disorder, its transmission and the options opened to them in management and family planning and child upbringing. Genetic counseling is new and will continue to generate interest in research; it is based on this fact that this investigation into accessing genetic information for families is necessary.

Statement of the Problem

6000 infants die of sickle cell disease in Nigeria yearly (Nwobi, 1997). This has continued over the years and has led to husbands blaming their wives for the death of their children. Issues of genetics are hardly discussed in families and parents do not even care to know the blood groups of their children. Sickle cell contains abnormal hemoglobin which causes the cells to develop a sickle or crescent shape. The cells are stiff and sticky, which tend to block blood flow in the blood vessels of the limbs and organs. Blocked blood flow can cause pain and organ damage. It can also raise the risk for infection.

The Rhesus factor incompatibility is another genetic disorder that has brought wreck to many marriages. In Rhesus factor incompatibility, the first pregnancy may be unaffected but successive pregnancies may either result in stillbirth or miscarriages. Olayinka (1987) points out that this problem is commonly blamed on witchcraft practices by the maternal in-laws, resulting in dissatisfaction and hatred. If couples or potential couples have problems, which will tamper with their fulfillment in marriage, there is need to create an awareness to help these people to have a sustainable marriage that would produce healthy babies.

Objectives of the Study

The specifics objectives for which this study is carried out is to:-

1. Ascertain Undergraduates level of accessing genetic information for family and child sustainability in Benue State
2. Determine if undergraduates are aware of the need to discuss with a specialist on blood group, genotype as they affect the choice of a spouse and offspring.
Research Questions

The following questions are asked to guide the study:

1. What is the level to which undergraduates access genetic information for family and child sustainability in Benue State?
2. How does your blood group and genotype affect your choice of spouse and offspring?

Hypotheses

The following hypotheses are formulated to guide the study

1. There is no significant relationship between undergraduate access to genetic information and family sustainability in Benue State.
2. There is no significant relationship between blood group, genotype and choice of spouse.

Methodology

The design adopted for the ex-post factor. Ex-post factor research design is defined by Nworgu (1961) as a systematic empirical inquiry in which scientists do not have control of independent variables because their manifestations have already occurred. For example, research involving genetics, intelligence, personality among others have been in existence and cannot be manipulated by the researchers. It is therefore suitable for obtaining information on undergraduate's level of accessing genetic information services.

Population

The population of the study is twenty eight thousand, four hundred and sixty (28,460) students. This is made up of students of Benue State University which has fifteen thousand six hundred and fifteen students (15,615). The Federal University of Agriculture, Makurdi has a population of twelve thousand eight hundred and forty (12,840) all information is from their offices of the Registry.

Sample and Sampling Technique

The sample size for the study is 379. This sample size is obtained by using the table for determining needed size of a randomly chosen sample from a given finite population of N cases such that the proportion be within 0.05 of the population proportion (p) with a 95% level of confidence (Krejcie and Margan 1970)

Instrumentation

The instrument for collecting data was Accessing Genetic Information Services (AGIS) Questionnaire was developed by the researchers. The instrument was validated by experts in the field of medicine and counselling. It was checked in terms of clarity, appropriateness of language, expressions and instruction to respondents. These validation processes ensured both content and face validity of the instrument. The questionnaire had two sections A and B. Section A comprised of questions 1-12 which sought to elicit information on undergraduates' level of accessing genetic information services with a specialist on the campus. Questions 13 – 16 tried to find out if the respondents discussion with a specialist about their blood group and genotype and the prevalence of hereditary diseases that could affect the offspring of their marriage and the choice of spouse.

Method of Data Analysis

The researchers used percentages in answering the research questions and the Chi-square statistics to test the hypothesis at 0.05 level of significance.

Result

The result of the study is presented as follows

Research question1: To what extent do undergraduates access genetic counseling?
Table 1: Distribution of respondents by extent of accessing genetic counseling services

<table>
<thead>
<tr>
<th>Levels of awareness</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I don't know of such services</td>
<td>140</td>
<td>36.9</td>
</tr>
<tr>
<td>I don't know of its importance</td>
<td>95</td>
<td>25.1</td>
</tr>
<tr>
<td>Just for privacy reasons</td>
<td>98</td>
<td>22.4</td>
</tr>
<tr>
<td>Confidentiality</td>
<td>59</td>
<td>15.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>379</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Distribution of respondents by places where counseling services are received

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the school</td>
<td>160</td>
<td>42.2</td>
</tr>
<tr>
<td>In the church</td>
<td>95</td>
<td>25.1</td>
</tr>
<tr>
<td>Through the mass media</td>
<td>75</td>
<td>19.8</td>
</tr>
<tr>
<td>Other sources</td>
<td>49</td>
<td>12.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>379</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Distribution of respondents by issues discussed during guidance counseling

<table>
<thead>
<tr>
<th>Issues discussed</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-marital issues</td>
<td>95</td>
<td>25.1</td>
</tr>
<tr>
<td>Family problems</td>
<td>65</td>
<td>17.1</td>
</tr>
<tr>
<td>Academic/career issues</td>
<td>200</td>
<td>52.8</td>
</tr>
<tr>
<td>Others</td>
<td>19</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>379</strong></td>
<td><strong>100.0</strong></td>
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Table 1 shows that 36.9% of the respondent said they are not aware of genetic counseling services while 25.1% stated they do not know of its importance. 22.4% attest they don’t visit a counselor because of their privacy while 15.5% said it is for other reasons.

From question 9-12, 42.2% said they got the services from the school, 25.1% say they got guidance services from their churches, 19.8% said that they got it through the mass media and 12.9% said that they got it through other sources.

Table 2: Blood group, genotype and the choice of marital spouse

<table>
<thead>
<tr>
<th>Statement</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am aware of my blood group</td>
<td>200</td>
<td>52.8</td>
</tr>
<tr>
<td>I am aware of my genotype</td>
<td>95</td>
<td>25.1</td>
</tr>
<tr>
<td>I have never discussed with a specialist on issues of blood group and genotype.</td>
<td>65</td>
<td>17.1</td>
</tr>
<tr>
<td>The advice from a specialist about my blood group will affect my choice of spouse</td>
<td>19</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>379</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

From question 9-12 21.5% discussed premarital issues, 17.1% family problems, 52.8% discussed academic/career issues and 5% discussed other things. This is an indication that majority of the students prefer discussing academic/career issues rather than pre-marital and family problems with the guidance counselor.

Research question 2: How will your discussion with a specialist on blood group and genotype affect your choice of spouse?
Table 2 shows that 52.8% of the respondents know their blood group while 25.1% do know their genotype. 17.1% have never discussed with a specialist on issues of blood group and genotype. 5 attest that the advice from a specialist will affect their choice of spouse.

This is an indication that the undergraduates are not aware of the consequences of genetic inheritance.

**Hypothesis 1:** There is no significant relationship between undergraduates' access to genetic information and family sustainability.

| Table 3: Chi-square analysis on significant relationship between undergraduates' access to genetic information and family sustainability. |
|---|---|---|---|---|---|
| Observed | Expected | $\chi^2$(cal) | $\chi^2$(tab) | Df. | Significant Level (P) |
| 379 | 94.75 | 39.89 | 7.82 | 3 | .05 |

Since the calculated value is greater than the table or critical value at 0.05 level of significance (p) ($2_{cal} = 39.8, 2_{tab} = 7.82 < 0.05$) the null hypothesis is rejected, which states, “There is no significant relationship between undergraduates' access to genetic information and family sustainability”. The alternate hypothesis is now accepted, meaning there is a significant relationship between undergraduates' access to genetic information and family sustainability.

**Hypothesis 2:** There is no significant relationship between Blood group, genotype and choice of spouse.

| Table 4: Chi-square analysis on relationship between discussing blood group, genotype and choice of spouse. |
|---|---|---|---|---|---|
| Observed | Expected | $\chi^2$(cal) | $\chi^2$(tab) | Df. | Significant Level (P) |
| 379 | 94.75 | 39.89 | 7.82 | 3 | .05 |

meaning there is a significant relationship between Blood group, genotype and choice of spouse.
Chi-square Table 4 shows that (2 cal = 43.89, df = 3 p < 0.005). This means rejecting the null hypothesis which states that there is no significant relationship between discussing with a specialist on issues of blood group and genotype and choice of spouse. In this case the data tells us that there is a significant relationship. We conclude that the null hypothesis is rejected, the alternate accepted, meaning there is significant relationship between discussing blood group, genotype and the choice of spouse.

Discussion of Findings

In answering research question one which sought to find out the levels which undergraduates access genetic counselling services, results show that at the awareness level, undergraduates are not aware of genetic information services which could be offered by the counsellor. At the second level, undergraduates attested that they received genetic counselling from their churches, the mass media and others, while at the third level, undergraduates discuss mostly academic issues. These findings disagree with Deng (2001) who opined that personal-social guidance should include understanding more about human sexuality. Furthermore, dangerous information is often disseminated on radio. This therefore implies that the school remains the most reliable place where undergraduates can obtain correct information on issues of spousal selection.

The second research question which sought information on blood group, genotype and discussion with a specialist. Majority of the students do not know their blood group and genotype. On advice of selection of marital partners, few stated they will not take a specialist advice. This result is not in line with Stone and Cozen (1976) who identified sickle cell as a recessive disease and advised couples seeking to have children to seek genetic counselling to avoid having children who are sicklers, since sickle cell has no cure. In the researchers view, if intending couples ignore the counselor's advice, they will accept in good faith the plight of their children. Since counsellors only provide information and allow their clients to take their decisions.

The hypotheses were also discussed. In hypothesis one, data analyzed on reasons why undergraduates do not access genetic counselling information services it was discovered that undergraduates do not access genetic counselling information services because most of them are not aware of the existence of counseling units on the campus. This result is in agreement with Kolo (1992) who noted that awareness of such services is often not created in the school settings and as such guidance programmes do not emerge on a large scale. Secondly lack of clarity on the role of guidance counsellors is often not spelt out as some counsellors are often turned to do odd jobs such as clerical or administrative staff. Olayinka (1978) also stressed the overwhelming need for counselling services in the school and the society at large. According to him rather than rely on columnist in newspapers and magazines, imams and babalawos for advice in solving their problems of life counselling services should be available for all and sundry. The Counseling units in tertiary institution should live up to their responsibilities by awareness about their existence and services provided.

The researchers also feel that in line with the objectives of the 6-3-3-4 system of education in Nigeria, the National Policy on Education (revised in 2004) the Federal Government saw the need to operate guidance and counselling units in secondary and tertiary institutions so that social and psychological needs of the students could be met. This should be encouraged through workshops and advocacy to move the society forward.

In hypothesis two, results indicate that undergraduates do not have knowledge of blood group and genotype. This is not in line with the tenets of the World Health
Organization (W. H. O. 2011) which defines sex education as a process by which information is given or imparted to a group of young adults and which takes into account the growth, anatomy and physiology of the human reproductive system and changes that can occur from youth all through developmental stages to adulthood. The American School Heath Association (ASHA 2011,) describes sex education as character education which consists of instruction to develop understanding of the physical, mental, emotional, social, economic and psychological phases of human relation as they are effected by male and female. The association insists that sex education should include more than anatomical and reproductive information and emphasis attitude development and guidance related to the association between the sexes. This view is echoed by Nwobi (1977), who stated that in Nigeria, sex is hardly discussed openly but done in secrecy. No wander undergraduates feel shy discussing premarital issues and would even dare the consequences of a specialist advice.

Conclusion
Based on the findings, the researchers concluded that lack of knowledge of the availability of Guidance and Counseling on the campus makes it impossible for undergraduates to effectively access genetic information services. If undergraduates who will eventually get into the marriage institution are properly informed about their hereditary traits which they will pass unto their offspring, they will cope better with their marriages, ignorance will be removed and sustainability of family and child will be ensured.

Recommendations
In view of the findings, the following recommendations were made

1. Counselling units in tertiary institutions should of necessity arrange for the orientation of fresh undergraduate students through which their services would be advertised.
2. As fresh students come in, mandatory registration in the school clinic should be ensured. Free blood and genotype test should be conducted on them and copies of the results be sent to counseling unit for proper counselling.
3. To attract students to the counselling unit, pamphlets on the mode of transmission on hereditary traits, interpersonal relationships, marriage and family relationship should be produced by the university authority and distributed to students.

References
ASHA (2014) American School Health Association: Wiley online library
Nwobi, P. (1997), Marriage and Family Counselling Practicum. Enugu: Fort

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WHO (2011) Advancing Sexuality Education in Developing Countries. www.guttmacher.org