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Application of Multivariate Logit Analysis to Contraceptive Adoption Decisions among Undergraduates of Kwara State Polytechnic

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ABSTRACT

Most youths, particularly undergraduate students, face serious health risks these days with too little factual information, too little guidance about sexual responsibility and may have access to contraceptives services without marking use of these services. Lack of information on the determinants of contraception adoption decisions among youths, particularly undergraduates, puts the youths, at high risk of unplanned and usually unwanted pregnancies. By overlooking or avoiding young people's reproductive and sexual health needs, we are failing these on whom the world's future depends. Therefore, there is a need to determine the various factors associated with the contraception adoption decisions among these undergraduate students, with a view to improving on their general welfare.

Keywords: contraceptive, Logit Analysis, Undergraduate, Adoption

1. INTRODUCTION

The gradual breakdown of traditional moral value in Nigeria has led to the adoption of a liberalized sexual behavior in the general population. Youths and adolescents do engage in pri-marital sex in an environment that permits them a great degree of freedom from adult supervision [1]. In a study of contraception among female students in the university of Benin it was observed that 52% of the sexually active female students did not use contraceptive [2], thus exposing themselves to unintended pregnancy and STD/HIV/AIDS and their complications.

It has therefore become necessary to conduct a survey to determine the significant factors associated with the adoption of contraception decision among undergraduates in an institution of higher education, where these youths majorly first experience freedom from the control of their parents or guardians after just attaining sexually matured stage of their life.

There is a controversy about discussing sexual issues with youths and children because some people believe that such information will make them more promiscuous. Other believe that a public that is educate about mature and responsible attitude towards sexual behavior and contraceptive will be the most sure guarantee against unwanted pregnancy. Also, according to WHO (1993), sex education does not lead to increased sexual intercourse among youths rather it only encourage abstinence and safer sex.

The study generated data on sexual behavior and use of contraceptives by these students so that health providers and instructors can use this information as baseline information for reproductive health programme, which could be utilized in the future and, from time to time to educate undergraduate students by Students Affairs Unit of the Institution.

In a study conducted by Society for Family Health (SHF, 1996) in six state of Nigeria, it was revealed that out of the 2256 youths interviewed, 38.6% were sexually experienced, with relatively more boys 46.2% than girls 30.1% already involved in sexually relationships. This clearly shows that sexual activity among youths in Nigeria can no longer be ignored. A review of the prevalence and consequences of premarital, unprotected sexual activity among adolescents in developing countries revealed that between 1971-1982, the increase of unmarried girls aged 15-19 years engaging in sex, was from 28% to 43% in urban areas of Africa [3]. Contraception means prevention of pregnancy by drug or any other device. According to [1], about 90% of the female students in the University of Benin were aware of contraception and knew almost all the major types of contraceptive knowledge, majority of girls did not apply the use of ti during their last sexual intercourse.

In Nigeria, unmarried youths are denied access to contraceptives services and information in government hospitals and health centers, leaving them without support when making reproductive decisions. There is therefore a need for

reproductive health service providers to organize more outreach programmes for youths on sexual and contraceptive counseling.

2. THE WORKING HYPOTHESES

The hypotheses to be tested in this study are that:

- H0: All the socio-economic characteristics being proposed as influencing adoption behaviour are not significant.
- H0: Kwara State Polytechnic undergraduates adopt contraception innovations better than non-undergraduates in kwara environs.
- H0: knowledge of students about contraceptives (condoms) has no influence on its utilization.
- H0: There is a relationship between the religion of students and their attitude towards utilization of contraceptives.

3. THEORETICAL FRAMEWORK

A widely accepted approach to explain decisions under uncertainty is the expected utility maximization theory. If the decision-makers preferences are in accord with certain postulates, the preference ordering over uncertain prospects can be represented by a function which can be interpreted as expected value of the utility associated with certain outcomes [4]. Expected utility by definition is the measure of relative preference for a particular prospect. Faced with a choice among prospects, an undergraduate will choose the one for which expected utility is largest. Thus a student seeks all different distributions of outcomes in terms of the mathematical expectation, and chooses the one with highest expected value.

Several adoption studies have used correlation analysis to examine the interrelationship of several factors affecting adoption [5]. However, this approach also produces only qualitative information regarding the effects of various explanatory factors; no information regarding the quantitative importance of various factors is obtained. In an attempt to determine econometrically, the quantitative importance of various explanatory variables, ordinary regression methods have been in most common use. However, many such studies have attempted to explain only the decision adoption versus non-adoption rather than the extent or intensity of adoption. Ordinary linear regression estimates, however, produce predictions other than zero or one for dependent variable. If these predictions are considered as probabilities, then predictions less than zero or greater than one are not relevant.

Turning to econometric literature, one finds that appropriate estimation methodology has been developed for investigating the effects of explanatory variables on dichotomous dependent variables, the development of binary choices (probability) analytical techniques assumes that an individual is confronted with a choice between two alternatives and his choice is influenced by his characteristics (a set of non-stochastic explanatory variables) and a vector of unknown parameters. Many types of binary choice analytical techniques exist and the four most popular ones include: Linear probability model, Discriminat analysis, the Probit and Logit analytical technique, which are the more popular and commonly applied. These tools take care of heteroelasticity of disturbance terms as well as constrain predictions to values between 0 and 1. The most commonly used qualitative response model is the logit model, which corresponds to a logistic distribution function. This model specifies a functional relation between the probability of adoption and various explanatory variables.

a. The Logit Analytical Technique

Logit analysis is a statistical technique use by observer or marketers to access the scope of customer acceptance of product particularly a new one. The continuous distribution with parameters m and b>0 having probability and distribution functions.

$$P(x) = \frac{e^{-(x-m)/b}}{b\,[1+e^{-(x-m)/b}]^2} \qquad (1)$$

$$D(x) = \frac{1}{1+ e^{-(x-m)/b}} \qquad (2)$$

The distribution function is similar in form to the solution to the continuous logistic equation

$$X= \qquad 1$$

$$\frac{}{1+e^{-r1\,(1/x_0\,-1)1}} \quad (3)$$

$$\mu = m \quad (4)$$
$$r^2 = 1/3\Pi^2 b^2 \quad (5)$$
$$r^1 = 0 \quad (6)$$
$$r^2 = 6/5 \quad (7)$$

Where e= represent the base of natural logarithm, which is approximately equal to 2.718
Di = the probability that a student adopts given knowledge of x_1

4. THE STUDY AREA AND THE SAMPLYING PROCEDURE

Kwara State Polytechnic was founded in 1972. The students in this community come from all parts of Nigeria, representing various cultures. All undergraduates at the polytechnic had hostel accommodation. The target population for the study consisted of the registered Kwara state Polytechnic Students on one hand, and other youths outside Kwara State Polytechnic on the other hand. Both male and female were interviewed. Specifically, a total of 300 youths responded, made up of 78 male students, 66 female students, 75 male non-students, and 81 female non-students. Every department was represented. A sample of 100 respondents were also utilizes as non-student (control).
A structured questionnaire was utilized for data collection through primary source. Pre-testing of questionnaire was carried out on 25 students in the Department of Computer science, Kwara State Polytechnic (the Department of the Researcher). Corrections and adjustments were made thereafter on the questionnaire. Completions of the questionnaire were done on the spot between 21st January and 12th February, 2013 (3 weeks duration) during which period academic session was fully on. The questionnaire used was drawn to cover demographic data such as age, sex, religion, marital status, ethnic group and highest education level of parents. Information's were also sourced on sexual behavior and use of contraceptive and problems of contraceptive use.

a. Analytical Tool

In this study, contraception adoption level was measured for each sampled respondents to enable us determine the extent of the adoption of improved practices. Logic analysis was used to identify the determinants of contraceptive innovation adoption behavior of youths (students and non-students). The logit model enables us predict the likelihood of adoption decisions expected of youths not included in the original sample if we have data on their personal attributes $y=f(x_1,x_2,x_3.....x_n)$.

Table 1. Definition of Socio-Economic and Demographic Variables in the Logit Model

Variables	Unit or Type	Description
v	Binary	1, if youth is an adopter, 0, otherwise
X_1	years	Age of respondent
X_2	Naira	Income of respondent
X_3	Naira	Expenditure on non-academic items
X_4	Binary	1, if respondent had both parents living together, 0, otherwise
X_5	Binary	1,if respondent was a strong Christian; 0, otherwise
X_6	Binary	1, if respondent was an undergraduate student of kwara Polytechnic: 0, otherwise.
X_7	Binary	1, if respondent was a female undergraduate at kwara state polytechnic; 0, otherwise

5. FINDINGS

5.1. Socio-Demographic Characteristics

The ages of the respondents ranged from 15-25 years with a mean of 20.3 years. About 60% of the respondents were males. While 81% were Christians, 15% were Muslims, and 3% were married. Parents of over 75% lived together. 11% had parents who were married but lived in different towns and 1% were products of single parents. A few

respondents (8%) had divorced parents or had one or both parent's dead. There was no significant difference between the proportion of Muslims (72%) and Christians (62%) using contraceptives.

5.2. Sexual Behaviour

The investigation revealed that 55% of male students and 25% of female students had experienced sexual intercourse before entering the Polytechnic, while 8% of the male students and 12% of the female students were sexually initiated on admission into the Polytechnic. About 83% knew at least one modern contraceptive method. Among the sexually experienced students, 75% were males while 25% were female. About 60% of the sexually experienced undergraduate male students used contraceptives, out of which 88% used condoms, while among the sexually experienced undergraduate female students using contraception, up to 70% used diaphragm. Only about 9% of the males using contraception used antibiotic tablets (believing it to be contraceptive) while 14% used pills. In spite of the student's high knowledge of modern (improved) methods or innovations of contraception (82%), only 32% practiced contraception during their last sexual intercourse.

More males (63%) than females (32%) have even had sex. The overall age of first sexual intercourse ranged from 7 to 25years. A large majority (74%) of respondents had their first sexual experience between ages 14-22. A few (15%) debuted into sexual intercourse between ages 7-13 while only 3% had their first sexual experience between 23-25 years (Table 2).

Table 2. Ages of Respondents at First Sexual Experience

Ages	Percentage (%)
7-10	6
11-13	9
14-16	22
17-19	38
20-22	14
23-25	3
Don't know	2
No response	6
Total	100

A large proportion (76%) of those who were sexually experienced had been sexually active in the last three months (March – May, 2013). Over 60% of the male respondents had sex with between 1 and 3 sexual partners while 56% female respondents had sex with 1 to 3 sexual partners.

5.3. Use of Contraceptives

Of those who were sexually experienced, less than half (42%) used contraceptive during their first sexual episode. The contraceptives mostly used were condoms (56%), withdrawal (11%), safe period (12%), traditional medicine from mothers (8%). The main sources of information about contraceptives were human biology textbooks (23%), the mass media (23%) and friends (17%).

A significant relationship was found between family situation and involvement of respondents in sexual activities. A large proportion (over 90%) of respondents whose parents were divorced or separated was involved in sexual activities.

Table 3. Results from the Logit Analysis

S/NO	Explanatory Variables	Parameter Estimate	Asymptotic Standard Error Standard Error

1	Responage, X_1	0.026	0.0087	3.0115*
2	Income, X_2	0.0003	0.0002	1.5006
3	Expend, X_3	0.2821	0.2327	1.2123
4	Parent, X_4	-0.0291	0.0083	-3.5060*
5	Religion, X_5	-0.5662	0.5177	-1.0937
6	Student, X_6	-1.2995	0.3331	-3.9012*
7	Female Student, X_7	0.0026	0.0004	6.5000*

Evidence from the study indicated that female undergraduate at the kwara state polytechnic adopted contraceptive innovations better than non- students. Seven socio-economic variables were tried, out of which the following were significant in influencing student's contraceptive adoption decisions: age of students, the family situation, and being a student, particularly a female student.

6. CONCLUSION

Although many undergraduate students at kwara state polytechnic were sexually active before their entry into the polytechnic, while most of these students knew a method of contraception, this knowledge was not strongly linked with self-confidence to adopt the use. Students of high income or high pocket money category tended to engage more in premarital sexual activity than their counterparts of low income or low –pocket money category. Health education could be promoted by the guidance and counseling section of the Students Affairs Unit of the Polytechnic to better focus on students self efficiency on contraceptive adoption decisions.

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