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Subjects and methods: In this cross-sectional study, three hundred and fifty (350) Medical undergraduate students were interviewed using pretested semi-structured self-administered questionnaires to assess their knowledge and practice of safer sex.

Keywords: *safer sex, medical undergraduates, STIs, unwanted pregnancy.*

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Profiling Safer Sex among Medical Undergraduate Students of Ebonyi State University, Abakaliki

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Abstract- Background: University undergraduates are at an age when experimentation with sex is prevalent. A significant number of young people still indulge in high risk sexual behavior. Hence, profiling safer sex would be important for the future health of this group. More so an improved knowledge among this group could act as a step down during peer interactions with other non-medical undergraduates.

Aim: This study was designed to assess the knowledge and practice of safer sex among Medical undergraduate students and to know to what extent their practice impacts on their health as regards contraction of sexually transmitted infections and having an unwanted pregnancy.

Subjects and methods: In this cross-sectional study, three hundred and fifty (350) Medical undergraduate students were interviewed using pretested semi-structured self-administered questionnaires to assess their knowledge and practice of safer sex. Variables were coded and analyzed with Epi info version 7 of the Centre for disease control, Atlanta. Data were presented as percentages and tables. The level of statistical significance was set at p= 0.05 (providing 95% confidence interval). Associations between variables were tested using ANOVA and χ^2 test. Logistic regression was applied to determine the influence of confounding variables on the primary outcomes.

Results: 52.3% of the respondents were aged 20-24 years, 31.4% were in 500 level of study (constituting majority of the respondents), 64.6% of respondents were males, and 54% were Catholics while 96% of the respondents were single. Among the respondents, the 6th year group had better knowledge of safer sex, statistically significant only for responses to safer sex involving protection against STIs, protected intercourse and all forms of contraception that prevents STIs (p=0.012, 0.011 and 0.016 respectively). The 5th and 6th year group identified condom use as a method of safer sex in 100% and 87% of the cases compared to other groups (p=0.0008). The groups however had similar responses to abstinence as a method of safer sex (p=0.777). Respondents in their 1st year and 2nd year of study were more likely to have contracted an STI in the past, have had an unwanted pregnancy and have more than three sexual partners (p=0.048,0.021,0.416 respectively). The 6th year group used condom consistently in 75% of cases compared to other groups (p=0.151). The 3rd year group had the highest number of respondents who were sexually active (42.9%, p=0.535). Logistic regression analysis done to determine the influence of age, religion, sex and marital status on the outcome measures showed that age and religion likely influenced a prior contraction of STIs while age alone likely influenced a prior unwanted pregnancy (p for age = 0.006, p value for religion = 0.041; p= 0.0012; OR for age- 0.213 95% CI (0.0712-0.634), OR for religion- 0.433 95% CI (0.186-0.966); OR for age- 0.068 95% CI (0.0132-0.3472) respectively).

Conclusion: It is important to incorporate safer sex education early in the curriculum of Medical undergraduates or during the senior secondary school period as part of health education. This would help reduce the adverse effects risky sexual behavior may have on the education and future reproductive careers of this group. Better knowledge would also encourage step down information during peer interactions with their non-Medical counterparts.

Keywords: safer sex, medical undergraduates, STIs, unwanted pregnancy.

I. Introduction

Safer sex is sexual activity engaged in by people who have taken precautions to protect themselves against sexually transmitted infections (STIs) and pregnancy[1]. It can also be referred to as safe sex or protected sex.[2] The term safer sex is preferred due to the fact that these practices reduce but do not completely eliminate the risk of disease transmission[2]. In contrast, unsafe sex or unprotected sex is sexual activity engaged in without precautions. Sexual behavior is determined by the attitudes of the individual concerned and underlies the thinking, beliefs, values and lifestyles of the individual as it relates to their sexuality.[3]

Safer sex practices became more prominent in the late 1980's as a result of the AIDS epidemic. Promoting safer sex is now one of the aims of sex education. Safer sex is regarded as a harm reduction strategy aimed at reducing risks, though not absolute.[4] Although, some safer sex practices include contraceptive methods, most forms of contraception do not protect against all or any STIs. Likewise, some form of safer sex practices like partner selection and low risk sexual behavior are not effective forms of contraception. The term safer sex was coined in response to the AIDS epidemic and its concept included limiting the number of sexual partners, using prophylactic antibiotics, avoiding bodily fluid exchange and resisting the use of drugs that reduce inhibitions for high risk sexual behaviours.[5] Some safer sex precautions include avoiding physical contacts (masturbation, phone sex, cybersex). These minimize the risk of exchange of body fluids.[2] Others include non-penetrative sexual practices like kissing, rubbing or stroking, use of barrier method,

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example condoms (male and female), dental dams, medical gloves, protected sex toys.[2] Proper use of barriers such as condoms, depend on the cleanliness of the surfaces of the barrier and method of their application. Handling can pass contamination to and from surfaces of the barrier unless care is taken.[2]

Acknowledging that it is usually impossible to have entirely risk free sex with another person, proponents of safer sex recommend that some of the following methods be used to minimize the risk of STI transmission and unwanted pregnancy- immunization, male circumcision, periodic STI testing, monogamy and 'polyfidelity'.[2] While the use of condoms can reduce transmission of STIs, it does not do so completely.[6] The suggested effectiveness of condoms in the prevention of STIs is from 85-95%. It is deemed unlikely for effectiveness greater than 90% due to slippages, breakages and incorrect use. Inconsistent use further reduces its effectiveness to as low as 60-70%.[6]

The Bill Gate foundation in March 2013 offered 100000 US dollars grant for a condom design that significantly preserves or enhances pleasure to encourage more males to adopt the use of condoms for safer sex.[2] Sexual abstinence is sometimes promoted as away to avoid the risks associated with sexual contact, though STIs may also be transmitted through non-sexual means or by involuntary sex.[5] Evidence does not support the use of abstinence only sex education. They have been found to be ineffective in decreasing HIV infection rates.[5]

University undergraduates are mostly at an age when sexual experimentation is prevalent. The knowledge and proper practice of safer sex is important for their future health viz preventing them from contracting sexually transmitted infections and having an unwanted pregnancy. Both can have a deleterious effect on their reproductive health and education. A significant number of these young people still indulge in high risk sexual behavior. This study seeks to primarily have an idea of the knowledge and practice of safer sex amongst Medical undergraduate students and to know to what extent their practice impacts on their health as regards contraction of STIs and having an unwanted pregnancy.

II. Subjects and Methods

Between 15th December 2016 and 1st June, 2017, we conducted a cross-sectional observational study of 400 Medical undergraduate students of Ebonyi State University Teaching Hospital, Abakaliki. Ebonyi State University is located in South Eastern Nigeria and has four major campuses located at Ezzamgbo (main campus), Presco (hosting 2nd year to 6thyear Medical students), Centre for Arts and Sciences (hosting first year Medical Students) and Ishieke campus. There are six levels in the Medical School of Ebonyi State University in increasing order of seniority, from 100 level/ 1st year to 600 level/ 6thyear. Respondents were obtained from the different levels of study from the Medical School, excluding non-Medical students. Each level or study group were approached just before the start of a lecture and their consent obtained after the purpose of the study was explained to them. Respondents to participate in the study were then selected using systematic random sampling technique whereby every second seated student was selected after randomly selecting a starting point.

The questionnaires were pretested among non-Medical students of Ebonyi State University who were not part of the study for clarity, assessment of length of time of administration, comprehension and other attributes. The questionnaire assessed the socio-demographic data of the participants, their knowledge and practice of safer sex and outcomes as measured by contraction of STIs or having had an unwanted pregnancy. Informed consent was obtained from the respondents before the questionnaires were administered and ethical approval was obtained from the authorities.

Data were coded and analyzed using Epi info version 7.0 of the Center for Disease and Control, Atlanta, 2015. The χ^2 and ANOVA tests were used for statistical analysis, logistic regression analysis was applied to determine the relationship between the outcome measures and some confounding variables such as age, religion, sex and marital status.

III. Results

A total of the 400 questionnaires distributed out of which 350 questionnaires were properly filled and available for analysis, giving a recovery rate of 87.5%.

From the data collated, most of the respondents belonged to the age group 20-24 (52.3%) while the least group was 35-39 (0.6%). Most of the respondents 110 (31.4%) were in 500L of study while the least were in 200L. 124 (35.4%) of respondents were females while 226 (64.6%) of respondents were males. Most of the respondents 189 (54%) were Catholics. Expectedly, 336 (96%) of respondents were single.

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Table 1: Frequency distribution of socio-demographic variables of the respondents

Socio-demographic Variables	Frequency N=350	Percentage
Age		
15-19	39	11.1%
20-24	183	52.3%
25-29	110	31.4%
30-34	16	4.6%
35-39	2	0.6%
Sex		
Male	226	64.6%
Female	124	35.4%
Marital status		
Single	336	96%
Married	14	4%
Religion		
Anglican	36	10.3%
Catholic	189	54%
Pentecostal	113	32.3%
Traditional	12	3.4%
Year of study		
100L	36	10.3%
200L	26	7.5%
300L	77	22%
400L	44	12.6%
500L	110	31.4%
600L	57	16.3%

From the above it is noted that the 20-24 age group had the highest population among the age groups while the 35-39 year old group had the least. There were more males than females and expectedly, 96% of respondents were single. Among the respondents also, 54% were Catholics while the 5th year group had the highest respondents among the classes/levels of study, 31.4%.

Table 2: Frequency distribution and comparison of responses as regards knowledge of safer sex among the groups

Parameters	Yr1 N=36	Yr2 N=26	Yr3 N=77	Yr4 N=44	Yr5 N=110	Yr6 N=57	X^2	P-value
Safer sex involves								
i. Prevention of unwanted pregnancy	12 (33.3%)	15 (57.7%)	36(46.8%)	27 (61.4%)	69 (62.7%)	45 (78.9%)	10.69	0.06
ii. Protection against STIs	6 (16.7%)	12 (46.2%)	30 (39%)	24 (54.5%)	72 (65.5%)	39 (68.4%)	14.53	0.012
iii. All forms of contraception that protects against STIs	18 (50%)	9 (34.6%)	15 (19.5%)	24 (54.5%)	72 (65.5%)	30 (52.6%)	13.88	0.016
iv. Protected intercourse	6 (16.7%)	9 (34.6%)	63 (81.8%)	24 (54.5%)	75 (68.2%)	39 (68.4%)	14.69	0.011
v. All forms of contraception	3 (8.4%)	6 (23.1%)	9 (11.7%)	6 (13.6%)	45 (40.9%)	6 (10.5%)	13.46	0.02
Methods of safer sex								

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Condoms	18 (50%)	18 (69.2%)	48 (62.3%)	33 (75%)	96 (87.3%)	57 (100%)	20.99	0.0008
Diaphragm	6 (16.7%)	9 (34.6%)	12 (27.3%)	30 (68.2%)	45 (40.9%)	39 (68.4%)	23.87	0.0002
Having one faithful partner free from STI	9 (25%)	3 (11.5%)	33 (42.9%)	18 (41%)	63 (57.3%)	36 (63.2%)	9.77	0.082
Kissing	0 (0%)	0 (0%)	3 (3.9%)	6 (13.6%)	0 (0%)	0 (0%)	10.35	0.066
Sex toys	0 (0%)	3 (11.5%)	0 (0%)	3 (6.8%)	0 (0%)	0 (0%)	10.73	0.06
Dental dams	0 (0%)	6 (23.1%)	3 (3.9%)	0 (0%)	0 (0%)	0 (0%)	20.64	0.0009
Abstinence	12 (33.3%)	6 (23.1%)	39 (50.6%)	15 (34.1%)	45 (41.9%)	15 (26.3%)	2.495	0.777
Phone sex	0 (0%)	3 (11.5%)	3 (3.9%)	9 (20.5%)	6 (5.5%)	3 (5.3%)	7.322	0.198
Non-penetrative sex	0 (0%)	3 (11.5%)	6 (7.8%)	18 (40.9%)	15 (13.6%)	18 (31.6%)	14.945	0.011
Masturbation	0 (0%)	3 (11.5%)	3 (3.9%)	6 (13.6%)	3 (2.7%)	0 (0%)	7.071	0.215

a) Knowledge of safer sex was observed in increasing level of study. Respondents in year 6 had the highest correct response to prevention of unwanted pregnancy being a component of safer sex (78.9%). This was however not statistically significant (p=0.06). Same trend is observed for safer sex involving methods for protection against sexually transmitted infections (STIs) with 68.4% of respondents in year 6 correctly responding and the difference here was statistically significant (p=0.012). Respondents in year 6 again had the best response as regards safer sex involving all types of contraception which was statistically significant (p=0.02)

b) Knowledge of methods for safer sex was noted in increasing level of study. All respondents in their sixth year of study correctly responded to condoms being a method for safer sex and the difference noted in the groups was statistically significant (p=0.0008). All groups except year 3 and 4 correctly responded to kissing not being a method of safer sex. This was however not statistically significant. There was a similar response among the groups for abstinence which is not a method of safer sex. This was not statistically significant (p=0.777).

Table 3: Showing the frequency and comparison of year of study with outcome measures.

Parameter	Yr1 N=36	Yr2 N=26	Yr3 N=77	Yr4 N=44	Yr5 N=110	Yr6 N=57	X^2	P-value
Sexually active	9 (25%)	9 (34.6%)	33 (42.9%)	9 (20.5%)	36 (32.7%)	24 (42.1%)	0.862	0.353
Prior screening for STIs including HIV	21(58.3%)	9 (34.6%)	21 (27.3%)	9 (20.5%)	51 (46.4%)	21(36.8%)	8.289	0.141
Use of condom always during sex	4 (44.4%)	1 (3.8%)	10 (30.3%)	3 (33.3%)	12 (33.3%)	18 (75%)	6.723	0.151
Number of sexual partners								
1	3 (33.3%)	3 (33.3%)	29 (87.9%)	8 (88.9%)	27 (75%)	24 (100%)		
2	3 (33.3%)	0 (0%)	2 (6.1%)	1 (1.1%)	4 (11.1%)	0 (0%)		
3	0 (0%)	6 (66.6%)	0 (0%)	0 (0%)	3 (8.3%)	0 (0%)	1.011	0.416
>3	3 (33.3%)	0 (0%)	2 (6.1%)	0 (0%)	2 (5.6%)	0 (0)%		
Previous STI	9 (25%)	3 (11.5%)	6 (13.6%)	0 (0%)	15 (13.6%)	3 (5.3%)	2.32	0.048
Previous unwanted pregnancy for self or partner	6 (16.7%)	6 (23%)	0 (0%)	6 (13.6%)	9 (8.2%)	0 (0%)	2.866	0.021

Among the respondents, the third year group had the highest number of sexually active respondents (42.9%) compared to the other groups. This was however not statistically significant (p=0.353). Surprisingly, the first year group had the highest number of respondents who had previously been screened for STI including HIV in the past (58.3%) compared to the other groups. This was however not statistically significant (p=0.141). Among respondents in the 6th year group, 75% of them used condoms consistently. This was however not statistically significant when comparisons were made with the other groups (p=0.151). Respondents in the first year of study were more likely to have more than one sexual partner

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(33.3%) compared with other groups. This was however not statistically significant (p= 0.416). Respondents in year 1 and 2 of study were more likely to have had a previous STI or unwanted pregnancy respectively among the groups (25%, 23% respectively). The differences noted were statistically significant (p=0.048 and 0.021 respectively).

Table 4: Logistic regression analysis showing the influence of some sociodemographic parameters (confounders) on the outcome measures

a) Prior history of sexually transmitted infection (STI)

Parameters	z- statistic	P-value	OR 95% CI	Likelihood ratio
Age	-2.7784	0.006	0.213 (0.0712-0.634)	15.22
Religion	-2.043	0.041	0.433 (0.186-0.966)	
Sex	-0.1567	0.876	0.903 (0.253-3.23)	
Marital status	-0.031	0.976	0.0001 (0.000-1.566)	

Age and religion were factors more likely to influence the behavior of respondents as regards having previously contracted a sexually transmitted disease including HIV.

b) Prior history of unwanted pregnancy

Parameters	Z-statistic	P-value	OR 95% CI	Likelihood ratio
Age	-3.228	0.0012	0.068 (0.0132-0.3472)	11.42
Religion	-0.809	0.419	0.697 (0.290-1.673)	
Sex	1.619	0.106	4.295 (0.735-25.08)	
Marital status	-0.022	0.982	0.0002 (0.0000-1.562)	

Only age was likely to influence sexual behavior of respondents as regards themselves or their partners having had an unwanted pregnancy previously.

IV. Discussion

The study was conducted among Medical undergraduate students of Ebonyi State University, Abakaliki at different levels of Medical training. It was aimed at ascertaining the knowledge and practice of safer sex among them and how it has impacted on their health viz a past history of unwanted pregnancy and contraction of STIs. University undergraduates are at an age when experimentation with sex is prevalent. The findings of this study highlighted the interrelationships between year of study and knowledge/practice of safer sex; and also between practice and contraction of STIs and unwanted pregnancy among respondents. Some statistically significant difference were noted between individual variables. The results of this study are in agreement with the fact that older (higher level) Medical students are more knowledgeable than their younger colleagues (lower level of training) in safer sex. This knowledge impacted their sexual behavior as a significant number of older students in higher classes modified their sexual behaviors with the knowledge they had. Respondents in year 1 and 2 of study were more likely to have more than 3 sexual partners and this was observed in the higher levels of previous contraction of STI and having an unwanted pregnancy in the two groups compared to the other groups. This highlights the need for introduction of safer sex earlier in the curriculum of Medical training.

Assessment of the knowledge of what safer sex involved showed a generally average knowledge of safer sex involving methods to prevent unwanted pregnancy. There was an increase in knowledge of this particular component with increasing level of study. In Nigerian Medical curriculum, exposure to Obstetrics and Gynaecology usually starts at the 5th year of Medical education. This may explain the trend noted in this study where all the parameters used to assess knowledge of safer sex showed an increased knowledge with higher levels of Medical education. This is similar to a study conducted at University of Lagos, though among non-Medical students. Assessment of the methods for achieving safer still showed an average knowledge among the respondents but with greater knowledge noticed among the 5th and 6th year groups. All respondents in the 6th year group responded correctly to the important role of condom use in practicing safer sex while there was similar response as regards abstinence being a method to achieve safer sex. Abstinence in the sense is not a safer sex method. This shows that more work needs to be done to train and retrain young adults on safer sex. There were slight variations between the findings of this study and that done by Apoola A et al at the University of Lagos. The dissimilarity would likely be due to the fact that the respondents in this study are Medical students and would have been exposed to some form of lectures on safer sex compared to their non-Medical counterparts.

A significant proportion of the respondents were sexually active, more in the first and second year groups and this group were more likely to have contracted a sexually transmitted disease in the past and themselves or their partners had an unwanted pregnancy. They are

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also the group in this study shown to have more than three sexual partners compared to their older counterparts and not have used condoms consistently. These findings may be attributed to the fact that they have a poorer knowledge of safer between the groups, are less experienced and younger. Some of these findings are similar to the findings from the studies by Apoola A et al, Chin B et al, Lau JT et al and Zhang D et al.

Logistic regression analysis done to determine the effect of age, religion, marital status and sex on the outcome measures showed that age and religion were likely to influence the respondents sexual behaviors as regards having had a previous STI and age likely the only factor to influence the sexual behaviors as regards having an unwanted pregnancy in the past. This is not surprising as age and religion play an important part in sexual behavior in Africa. Most of the respondents were Christians with up to 54% Catholics. These religious groups preach abstinence and prohibit pre-marital sex. More so, as individuals get older, they gain experience and are not likely to indulge in high risk sexual behaviors as shown in this study.

V. Conclusion and Recommendations

Undergraduates are truly at an age when sexual experimentation is rife. Knowledge and practice of safer sex is still poor or at best average. There are other factors that influence sexual behaviors besides the knowledge of safer sex such as age and religion. Individual at a lower level of training are more likely to engage in high risk sexual behavior with attendant consequences that may jeopardize their future reproductive career.

From the foregoing, it is imperative that safer sex should be incorporated into the curriculum of Medical undergraduates at an early stage of training. This could also be incorporated into the senior secondary school curriculum as part of health education. When fully armed with the knowledge of safer sex, Medical undergraduates can be the bridge between awareness campaigns for safer sex and their non-Medical counterparts, acting to step down information to this group that they often interact with while practicing same.

Conflict of Interest

The authors have no conflict of interest to declare.

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