RESEARCH ARTICLE

KNOWLEDGE OF MODIFABLE FACTORS THAT INFLUENCE FERTILITY AMONG LAUTECH UNIVERSITY STUDENTS IN OGBOMOSO, SOUTH-WEST NIGERIA

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ARTICLE INFO	ABSTRACT

Background: Africa societies place so much emphasizes on fertility so much that couples with infertility after sometime faces considerable emotional, physical and psychological problems.
Aim: To explore knowledge of effect of age, obesity, smoking, timing of intercourse, previous STIs and environmental pollutants on fertility among University students.
Methods: This was a cross- sectional descriptive study of 420 consented students of Ladoke Akintola University of Technology (LAUTECH), Ogbomoso. They were interviewed through self–administered pre-tested structured questionnaire. Data were entered, analyzed for descriptive and inferential statistics using SPSS 20 statistical package.
Results: The mean ± SD age of the respondents was 22 ± 3.16years (range 15–40years). Most (90%) of the respondents were single at the time of interview. A (third 33.3%) participants overestimated by 10years, the age at which fertility starts to decline in women. Only one in four participants correctly identified that female fertility start to decline before 35years. Every one in five participants believed that fertility never declined in men. Only 10% of participants correctly identified the most fertile period in women's menstrual cycle. Majority of male (60.8%) and female (70.1%) respondents believed that smoking has "a lot," of effects on male and female fertility respectively. Smoking was believed to have no effect on fertility by females compared with the males (31% vs. 15% P< 0.001).Higher proportion of males than females agreed that alcohol has no effect on fertility (10.3% vs. 3.8% P< 0.001). Obesity was believed to affect fertility by 61.5% and 56.5% of males and females respectively. STIs was said to have "no effect at all" on fertility by 18.5% of participants. With use of modern contraception, 64.5% the participants believed that it has "a lot," of effect on female fertility, while more male than female said it has "no effect" on female fertility (13.5% vs. 3.3% P< 0.001).
Conclusions: Significant gaps exist in the knowledge of the students and modifiable factors that influence fertility. Students with prior information on reproductive health matters demonstrated better knowledge of impact of the modifiable factors on fertility potential of both men and women.

INTRODUCTION

It has been argued that fertility is a variable which an individual could have control over (Cleland *et al*., 1987). Most people want and expect to have children at some stage of their life. However for reasons beyond personal control they lack adequate knowledge of preventable factors that impair them from achieving this (Karin *et al*., 2013). Increasing maternal and paternal age has been shown to negatively affect fertility and obstetric outcomes (Chapman *et al*., 2006; Biro *et al*., 2012; De Graaff *et al*., 2011; Fretts 2001; Ford *et al*., 2000; Hassan *et al*., 2003; Jolly *et al*., 2000). Worldwide, there has been an increased in age of childbearing in last decade (Mills *et al*., 2011; Li *et al*., 2011; Schmidt *et al*., 2012).

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This increase were partly due to improved education, assess to effective contraception, employment opportunity for women and gender competition for the attainment of high level of educational status. As a result of these, we now have increased aged-related infertility with more peoples seeking assisted reproductive technology (ART) while some have fewer children than they desired (De Graaff *et al*., 2011; Mills *et al*., 2011). Female's fecundity starts declines from age of 30 and this accelerates by 35years while increasing age of men affect negatively the semen quality and fertility potentials (Ford *et al*., 2000; Utting *et al*., 2011; Eskenazi *et al*., 2003). It is now clearer that many underestimate the effects of age on fertility and its outcome. An Australians study observed that most respondents underestimated by at least ten years, age at which fertility tends to decline in both male and female (Karin *et al*., 2013).

Knowledge of fertile period allows a woman to fairly control her fecundity. Sexuality education, as it was observed in educated enabled such women to have more children, even with use of contraception and this negates the believe of women with lower educational status that contraceptions hinder the fertility desires of a woman (Karin *et al.*, 2013; John *et al.*, 2007; Abdulkarim *et al.*, 2010).

Abdulkarim Mairaiga in his study of the Kanuri's (an indigenous ethnic tribe in North eastern Nigeria) sociocultural determinants of fertility observed that children regardless of gender is highly valued among their tribe and they tend to have many wives to achieve this objective, while ideal family size among them is put at sixteen (Abdulkarim *et al.*, 2010). Many women among this ethnic group in North-eastern Nigeria believe contraceptive use may make a woman infertile hence their aversion towards it (NDHS 2008). In Nigeria, as well as other developing countries secondary infertility appears to be commonest form of infertility and most are said to be due to the effect of sexually transmitted infections acquired earlier (Jolly *et al.*, 2000). Moronkola *et al.* noted from their study in Ibadan among women, that just a little over half of them believe that prior history of sexually transmitted infections could jeopardize future fertility potential in life, however, many could actually not tell when fertility tends to decline in both male and female and majority do not have a positive attitude toward seeking knowledge on reproductive health related matters (Moronkola *et al.*, 2006).

A survey of students of Ottawa University over-estimated the likely successes that assisted reproductive technology could offer and most of the students could identify basic factors that could predispose to infertility especially the influence of obesity, alcohol and smoking on fertility. Though majority over-estimated fertility potentials of women in their thirties (Kelley *et al.*, 2013). In a fertility clinic in Germany it was observed that using body mass index measurement prevalence of obesity was 9% among women and 3% among men but only 32% of men and 28% of women understand that obesity could impact negatively on fertility. It was established that behavior related fertility disorders should not be underestimated and adequate information to the general public that lifestyle mediated fertility risks should be actively promoted (Schilling *et al.*, 2012). The aim of this study is to evaluate the knowledge of Ladoke Akintola University of Technology (LAUTECH) students about modifiable factors that influence fertility. The student population was chosen on account of the fact that they represent the future generations of would be couples and also the fact that high risk behaviors that impart on fertility are predominant among them.

MATERIALS AND METHODS

This study was carried out at the LAUTECH, Ogbomoso. The study population was students in all the Faculties of the LAUTECH, Ogbomoso. It was a cross-sectional descriptive study among all consenting students of all Faculties in the University. The sample size of the study was determined by Fischer's formula (Armitage *et al.*, 2002). The proportion of the sample size was pegged at 50% due to dearth of studies on the topic. Also, a 10% attrition rate was assumed.

Thus, 420 students were recruited for the study. A multi-stage random sampling technique was used. Departments within the Faculties were selected randomly. All the level of educational classes were also selected randomly. Exclusion criteria were those who did not consent to be part of the study. The data collection instrument is a structured questionnaire containing three sections. SECTION A sought information on demographic data of the students including age, sex, tribe, religion, course of study, level of study, marital status, while SECTION B was employed to determine their knowledge of some modifiable factors that could influence fertility namely effect of alcohol, smoking, obesity, exposure to environmental pollutants, contraceptive knowledge and prior exposure to sexually transmitted infections and how they could affect fertility. Their knowledge was rated as a low, a little, no effect and don't know for all these factors and SECTION C consisted of tests on reproductive health knowledge as well as test of sources of information regarding reproductive health matters, when fertility declines in both male and female and when a woman is most fertile in the menstrual cycle as well as their knowledge of assisted reproductive technology (ART).

The questionnaire was pre-tested among 30pre-degree students of LAUTECH Ogbomoso, after which ambiguous questions were re-phrased. The questionnaire was self-administered during break period immediately after the lecture. The research assistant approached the class immediately after the lecture, he introduced the purpose of the study and their consent was sought. The non-consented students were allowed to leave the class. Approval for the study was obtained from the ethical review committee of LAUTECH Teaching Hospital, Ogbomoso. The raw data from the field was screened for inconsistencies. Analysis of data was by computer using Statistical Package for Social Sciences (SPSS) version 20. Cross-tabulation of variables was done and chi-square was used to established relationship between variables. The level of statistical significant was set at p < 0.05.

RESULTS

A total of 420 students were interviewed but only 400 questionnaires were found suitable for analysis. There were incomplete information in the remaining ones. The age range of respondents ranged between 15-40 years with a mean age of 22±3.16years. The male respondents represent 55.8% of sampled population and the female population was 44.3% with a male to female ratio of 1.3: 1. About 67.5% of the students were Yoruba with 24.3% being Igbos and 8.3% from other tribes of Hausa, Tiv and Urhobos. The Christian population from this study represents 80% and 21.8% were Muslims, with only 3% practicing traditional religion. The faculty of Agricultural sciences had the largest proportion of respondents (31.5%) and was followed by faculty of Engineering and Technology with 21.8% and the faculty of Clinical sciences having the least student with 4.8%.The representation of student by level of study showed that third year students (300level) were in the majority with 32.3% of sampled respondents and this was followed by second year students (200level) with 26.8% and 2.3% of sampled students were post graduate students. Most of the students were single representing 90% of sampled students with 4% cohabiting with their partners and only 6% being legally married to their

partners and all that are married, are in monogamous relationships Table 1.

Table 1. Sociodemographic Characteristics (N = 400)

CHARACTERISTCS	N	%
AGE		
15-24	348	87.0
25-34	50	12.5
35-44	2	0.5
SEX		
Male	223	55.8
Female	177	44.2
FACULTY		
Basic Medical Sciences	40	10
Clinical Sciences	19	4.8
Agricultural Sciences	126	31.5
Environmental Sciences	53	13.2
Management Sciences	30	7.5
Pure and Applied Sciences	45	11.2
Engineering and Technology	87	21.8
LEVEL OF STUDY		
100	46	11.5
200	107	26.8
300	129	32.2
400	59	14.8
500	50	12.5
Postgraduate	9	2.2
MARITAL STATUS		
Single	360	90.0
Cohabit	16	4.0
Married	24	6.0

The response of the students when questioned about their knowledge of when fertility begins to decline in male and female, 33.3% of the students believe that fertility starts to decline in women at >45years of age with 25.8% stating that fertility declines at 36-44years.While 24.5% do not know when fertility declines in men, 18.3% believe that fertility never declines in men with 21.3% noting fertility to decline between 20-29 years Figure 1.

About 30% of the students believe that the most fertile period in a woman's menstrual cycle is the week just before commencement of next period with 24.5% not knowing when in the menstrual cycle that a woman is most fertile and only 10.0% correctly noted that in the middle week between periods is the most fertile period Figure 2.

When asked to rate their level of knowledge about reproductive health matters 31.3% rated themselves as having some knowledge on reproductive health matters with 30.3% rated their knowledge as good and 17.3% having no knowledge regarding reproductive health matters.

The internet represent the most preferred source of obtaining information on reproductive health matters 29.1% for most of the sampled students, while 28.6% will prefer to have their information from books on reproductive health matters. Newspaper represented the least preferred source of obtaining information for most of the respondents Table 2. Male participants were more likely to seek health information from health professionals than female counterparts (14.4% versus 7.8%; P< 0.02).

Concerning modifiable factors affecting fertility, smoking has been said to have "a lot," effect on male and female fertility by 60.8% and 70.1% of respondents respectively. However, significant more female than male participants believed that smoking has no effect at all on female fertility (31% vs. 15% P< 0.001). In term of alcohol intake, 64.8% and 63.8% of participants agreed that alcohol consumption greatly affect fertility in male and female respectively. Nevertheless, more males than females agreed that alcohol has no effect on male and female fertility (10.3% vs. 3.8% P< 0.001). More participants believed that obesity affects male fertility than female fertility (61.5% vs. 56.5%), though this difference was not statistically significant.
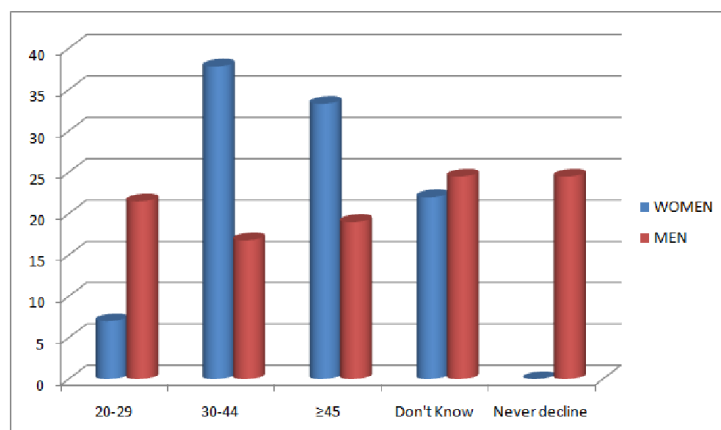

Fig. 1. Age at which participants think fertility starts to decline in women and men.

Table 2. Respondents Preferred Sources of Information on Reproductive Health Matters

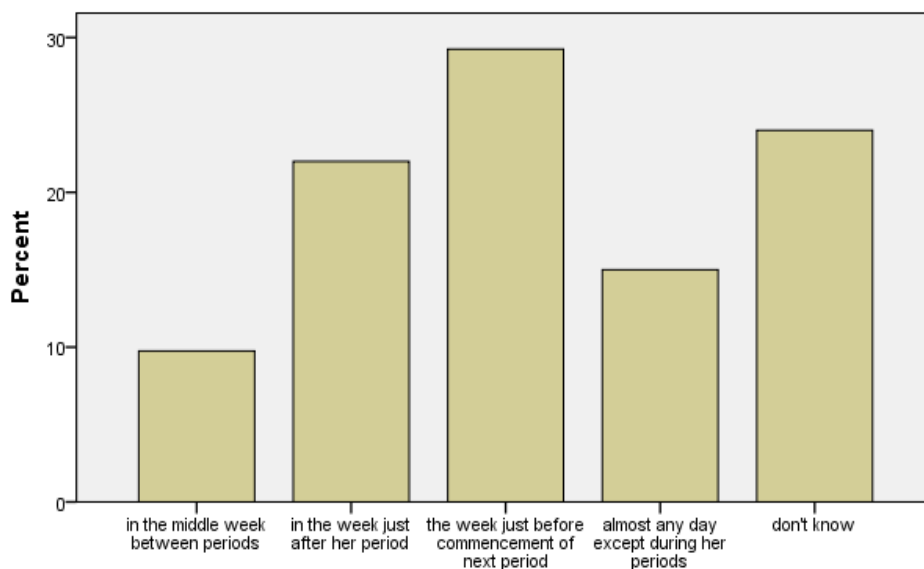| Preferred sources of Information	Frequency*	Percentage (%)
Internet	116	29.0
Health Professionals	89	22.3
Family/Friends	99	24.8
Educational institutions	84	21.0
Mass- Media	70	17.5
Newspaper	78	19.5
Books	114	28.5

*Multiple choices allowed

Fig 2. Participants opinion about fertile period in women's menstrual cycle

Environmental pollutants was agreed by the participants to affect more male than female fertility (68.5% vs. 50% not statically significant). Sexually transmitted infections (STIs) was agreed by 64.5% of the participants to have "a lot," of effect on future fertility, while 18.5% said it has "no effect at all" on fertility and 16.8% don't know. With use of modern contraception, 64.5% the participants believed that it has "a lot," of effect on female fertility, while more male than female said it has "no effect" on female fertility (13.5% vs. 3.3% P< 0.001) and 11.5% of male with 7.3% of female participants don't know if it has effect on fertility.

DISCUSSION

This study has shown that considerable knowledge gaps exist among these University students on knowledge of factors that influence fertility. While 33.3% overestimated age at which fertility declines in women by about 10years at more than 45years of age, the majority of sampled students do not know when fertility declines in men. These results are similar to studies from Australia and Pakistan (Karin *et al*., 2013 and Sumera *et al*., 2000). The poor knowledge demonstrated by these students may reflect general societal attitude towards reproductive health matters, as people generally regard it as an innate attribute that one will generally get knowledgeable of with time.

While only about 25% of respondents could correctly identify the most fertile period in a woman's menstrual cycle in this study, 46% were able to identify same in Sumera Ali *et al*., 2000 and this might be on account of differential characteristics of the study population. Sumera Ali *et al* 2000 study was done among adult population with prior experience in childbearing. The proportion that could identify fertile period in a woman in (Karin *et al*., 2013) study was 60% and this might also be attributed to influence of study environment as Australia is a developed country with well-structured health and educational program as opposed to Nigeria and Pakistan. While 51.7% of the sampled students have sought information regarding reproductive health matters and of those that have ever sought information, with 30.3% rating their knowledge as good.

This contrast with (Karin *et al*. 2013) study where close to 61% of respondents rated their knowledge as good and also from (Kelly *et al*., 2013) from Canada with high proportion of respondents with good understanding of reproductive health matters. This might be a general reflection of health promotion and intervention strategies in these two developed countries.

Only 43% of the total students population believed past history of sexually transmitted infections could affect fertility later in life, this is smaller than (Moronkola *et al*., 2006) study from Ibadan of 56%. The probable reason may be that women from the Ibadan study who were attending family planning could have better structured information on impact of sexually transmitted infection through routine health talk usually given to them. The figure is also smaller than (Clifford *et al*., 2008) where about 57% of respondents know that prior history of sexually transmitted infections could affect fertility later in life. This might be because Clifford study was done among secondary school student with much degree of information on reproductive health matters as this is incorporated into school's curriculum in Canada.

While only 20% of students are aware of assisted reproductive technology (ART) in this study, this is similar to (Sumera Ali *et al*., 2000) study with awareness of assisted reproductive technology at 22%. The reason for this may be on account of the fact that both countries are developing countries with poor awareness of this technology in the two countries. This result contrast with (Kelly's *et al*., 2013) study where almost all respondents sampled are aware of assisted reproductive technology. The wide availability of this procedure in this country may account for this. The result from this study was also lower than what was obtained from Enugu, Nigeria about awareness of student on sperm donation for the procedure of invitro- fertilization with an awareness rate of 98.3% of respondents (Onah *et al*., 2008). The likely reason for this is the fact that the study was carried out among medical students in whom knowledge about assisted reproductive technology is expected to be high as opposed to this study involving students from other disciplines. Concerning, the contribution of ART in helping infertile couples, 36.3% believe it can only do little in solving problem of infertile couple while about one third believe it can solve all problems of infertile couple.

This differs from (Kelly *et al*., 2013) study where almost 80% of student interviewed claim it can solve all problems of infertility. This might bring to the fore the role of mass media, as undue exaggeration of success derivable from this procedure might be responsible for this differential. The most preferred source of obtaining information is via the internet at 29.0% on reproductive health matters from this study as opposed to (Karin *et al*., 2013) study with 58%, the fact that it is the most preferred in the two studies shows the growing impact that internet is having on peoples life as it is readily accessible even via the phone. The huge disparity in sizes in the two studies might have to do with ease of access in the two countries.

While those who have had access to information on reproductive health matters as a percentage of total sampled student 33.5% believe that smoking and obesity affect male factor fertility with 36% believing that smoking and obesity affecting female factor fertility. This is quite similar to (Karin *et al*., 2013) study of 40% and 35% of these factors affecting fertility in both men and women and this may underscore the fact that emphasis on these factors is not often stressed in most health intervention and promotion strategies as it relates to fertility. The students that are married appear to have better knowledge of impact of modifiable factors that influence fertility and this might be on account of deliberate attempt at seeking knowledge to equip them with challenges that fertility may throw up in marriage.

Across all Faculties and the level of study, knowledge of impact of smoking, obesity, alcohol intake and prior history of STI as it affect fertility was poor, though among students of Faculty of Clinical sciences and Basic medical sciences they appear to have better knowledge of impact of these factors. This may account for the high incidence of high risk social and sexual behavior among student population and quite similar to what was obtained Kano, Nigeria (Kaabir *et al*., 2004). While the effect of smoking and its relationship to lung cancer is well known, the impact of obesity on cardiovascular diseases and Diabetes Mellitus is more stressed as against its effect on fertility.

Conclusion

The study has shown that substantial gaps exist in the knowledge of these students and modifiable factors that influence fertility. Students with prior information on reproductive health matters demonstrated better knowledge of impact of above listed factors on fertility potential of both men and women.

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