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Comparative cross-sectional study on the prevalence, determinants and willingness to use long-acting reversible contraception among female students attending public and private universities in Ekiti State, Southwest Nigeria

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ABSTRACT

Objectives Long-acting reversible contraception (LARC) provides continuous pregnancy prevention to women for a period of 3 to 12 years, and it is very safe and effective. The aim of this study was to determine the prevalence, determinants and willingness to use LARC among undergraduate female students attending public and private universities in Ekiti State, Southwest Nigeria

Design This survey employed a cross-sectional comparative study design.

Setting Public and private universities in Ekiti State, Southwest Nigeria.

Participants 418 female students in their undergraduate years at public and private universities (208 students in public universities and 210 students in private universities).

Primary and secondary outcomes A semistructured questionnaire was used to gather data, and analysis was done using IBM SPSS V.25. Prevalence, willingness and determinants of LARC were determined and compared between public and private universities at the level of bivariate analysis using χ^2. Multivariate regression analysis was used to determine the predictor of LARC use. The statistical significance level was placed at a p value of <0.05.

Results The mean age of female undergraduate students was higher in public universities (21.1±2.5 years) than in private universities (19.3±2.1 years). The prevalence of LARC usage among the sexually active respondents was 12.5% for public universities and 12.7% for private universities. Determinants and predictors of LARC uptake among the students in both university settings were age, marital status and good knowledge of LARC. Only about one quarter (24.0% in public universities and 24.8% in private universities) were willing to take up LARC among the students in both settings.

Conclusion The prevalence and willingness to take up LARC in the public and private universities are still low. Determinants and predictors of LARC uptake include age, marital status and good knowledge of LARC.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This study is a unique one based on the fact that it is done among students who are either adolescents or young persons and at risk of unwanted unplanned conception.
⇒ This article used a comparative study design that helps bring out the differences and/or similarities among respondents in private and public universities.
⇒ This study did not consider other methods of contraception, especially barrier methods that have the advantage of providing double protection to the respondent's age group.
⇒ This study, being a cross-sectional study, can only give a snapshot finding, and cause-and-effect relationships cannot be determined.
⇒ Being a questionnaire-based study, recall bias to some responses cannot be totally over-ruled.

BACKGROUND

Unplanned and unintended pregnancies are not only a medical issue but also now becoming a social and public health issues worldwide.[1 2] When unintended pregnancy occurs among undergraduates, the effect can be disturbing. This is because pregnancy in adolescents and young people is seen as a factor of vulnerability that can adversely affect adolescent and youth development.[3 4]

With tertiary education, most youth who are at the beginning of the exploration of their sexuality are often free of parental guidance, and with alcohol and other illegal drug use and peer influence, the occurrence of unwanted pregnancies is relatively increased.[5–7] The impact of mass and social

media on students has also been well researched, and it has been observed that they have wider access to viewing sexual activities in magazines, on phones, on the internet and on television more than before.[1]

Contraception is a device or method used to prevent pregnancies,[8–10] and while all forms of contraception and birth control methods can be used by young women,[11] long-acting reversible contraception (LARC) methods with the benefit of high effectiveness and very few contraindications are considerable, especially for youths who are nulliparous and unmarried due to their long-lasting effect with less frequent usage and rapid return to fertility.[12 13] It has no age barrier to its usage by adolescents and young adults, and when LARC is discontinued, return to fertility is prompt.[8 14]

The benefit of LARC, especially for undergraduate university students, apart from its 99% effectiveness, easy reversibility and rapid return to fertility, is the uninterrupted protection of 3 years and above of single usage, which might just be enough to take most students throughout their university stay. Also, studies from systematic reviews and meta-analyses among adolescent and young females have shown that when LARC methods are used, the 12-month continuation can be as high as 84%, and the pooled prevalence of discontinuation of LARC use was just 36.94%.[15 16] These findings show that taking up LARC by adolescents and young persons may help better adherence to contraception and give the desired benefits.

Despite these many merits and advantages, however, LARC methods are still very underutilised because of fear and other barriers.[13 17] However, it is important to note that LARC is not protective against sexually transmitted infections, including HIV/AIDS and hepatitis. In fact, intrauterine devices (IUDs) predispose in individuals with multiple sexual partners to infections.[9] Therefore, caution must be taken, and the use of barrier methods in addition is advised for students with multiple sexual partners.

Focus on LARC use among youths shows that disaggregated data are sparse and there is limited documentation on LARC among tertiary institution students, but using insight from data among reproductive age group women which include the youth age group, research shows that LARC use is often low, though the popularity of this method does vary by geographical location, with the highest rates in Asia and North America.[18] Few data gathered from developed countries like the United Kingdom show a low LARC uptake rate of 10.2% even among clinical sciences undergraduate university students. Studies also show that students are more likely to use condoms and emergency contraception pills in the prevention of unintended pregnancies.[19–21]

The low uptake of LARC despite its immense benefit has been observed in both developed and developing countries, and this has been linked to cost, low level of information, poor knowledge, misinformation about the devices, lack of counselling skills, husband disapproval, adverse side effects, poor accessibility, lack of youth-friendly services and bias or mistrust between youths and service providers.[18 22–25] Competence in the provision of services and increased awareness through education programmes can help increase the uptake of LARC.[26–29]

The aim of this study was to determine the prevalence, determinants and willingness to use LARC among undergraduate female students attending public and private universities in Ekiti State, Southwest Nigeria. This study aimed to answer questions on prevalence and willingness to use LARC, as well as evaluate the determinants of LARC use among undergraduate students, and to also assess whether there exist differences in these variables among students in public and private universities.

The hypotheses of this study are:

Null hypothesis

- There is no difference in the prevalence of LARC among undergraduate students in public and private universities in Ekiti State.
- There is no difference in the factors affecting the uptake of LARC among undergraduate students in public and private universities in Ekiti State.
- There is no difference in willingness to take up LARC among undergraduate students in public and private universities in Ekiti State.

Alternate hypothesis

1. There exists a difference in the prevalence of LARC among undergraduate students in public and private universities in Ekiti State.
2. There exists a difference in the factors affecting the uptake of LARC among undergraduate students in public and private universities in Ekiti State.
3. There exists a difference in willingness to take up LARC among undergraduate students in public and private universities in Ekiti State.

MATERIALS AND METHODS

Study area

This study was undertaken in Ekiti State of Nigeria. The state, created in 1996, has Ado-Ekiti as its administrative headquarters. The state has 3 senatorial districts (South, Central and North) and 16 local government areas. It is bounded by Kwara and Kogi States to the North, Ondo State to the South and East, and Osun State to the West.

Study design

This study employed a comparative cross-sectional design and was undertaken among a total of 418 (208 from public universities and 210 from private universities) undergraduate female university students attending public universities (Federal University, Oye) and private universities (Afe Babalola University, Ado-Ekiti) in Ekiti State.

Data collection

This study was done from the month of November 2019 to January 2020 using a semistructured self-administered questionnaire (online supplemental file 1) with four sections (Section A—sociodemographic characteristics;

Section B—prevalence of LARC; Section C—willingness to use LARC; and Section D—determinants of LARC) and adapted from the questionnaires on contraception and reproductive health by the Population Reference Bureau, WHO and the University of Mary Washington.[30–33] The questionnaire was pretested at the Bamidele Olumilua University of Education, Science and Technology, Ikere-Ikiti, Ekiti State, using 10% (42) of the entire questionnaire, which was not included in the study. After pretesting, appropriate corrections were made to the questionnaire where necessary.

Sample size determination

To compare the public group with the private group, the minimum sample size for this study was determined by using the formula for the comparison of two proportions:[34]

$$n = \frac{(U+V)^2\left[P_1\ (100-\ P_1)+\ P_2\ (100-P_2)\right]}{(P_1-P_2)^2},$$

where n=minimum sample size, U=standard normal deviate (SND) corresponding to the power of 90%=1.645, V=SND corresponding to 95% CI for two-tailed test=1.96, P1=proportion of students using the LARC method in public universities is 23.4%[12] and P2=proportion of students using the LARC method in private universities is 10.2%.[19] A sample size of 202 was obtained for each arm, but this increased to 225 sample size per arm (225 for public universities and 225 for private universities) when a 10% addition was done to compensate for non-response or improperly filled questionnaires.

Sampling technique

A multistage sampling technique was employed in the selection of eligible participants for the study. In Stage 1, Federal University, Oye-Ekiti was chosen via a simple random sampling technique (balloting) as against Ekiti State University, Ado-Ekiti for public university respondents, while Afe Babalola University was selected purposively (the only private university) in the State for private university respondents. At Stage 2, three colleges/faculties were randomly chosen using a simple random sampling technique (balloting) from each of the universities selected at stage 1. At Stage 3, three departments were chosen using a simple random sampling technique from each of the three colleges earlier selected at Stage 2. This gave a total of nine departments per institution, and an equal allocation of questionnaires to each of the departments was done. At Stage 4, the systematic sampling technique was employed to select respondents after the sampling interval had been determined by dividing the number of allocated questionnaires (25) by the list of students in each department (sampling frame). The first respondent was chosen using a simple random sampling technique (balloting). Replacement was done where the chosen respondent declined to participate by selecting the next student on the list, and the sample interval was subsequently applied from the selected respondents.

Data analysis

Data were sorted with incomplete questionnaires removed, coded, entered and analysed using IBM Statistical Package for the Social Sciences (SPSS) statistics V.25. Categorical variables were summarised as proportions charts and tables. Continuous variables were presented as means (SD), and the comparison between the public and private universities was done. Statistical significance of the observed differences in the cross-tabulated variables was determined using χ^2. Multivariate regression analysis was used in the determination of the significance of the determinants of LARC. A p value of less than 0.05 at 95% CI was used as the level of significance.

Ethical considerations/patient and public involvement

Ethical approval (Ref. No.: ERC/2018/09/14/142A) was obtained from the Health Research and Ethical Committees of the Federal Teaching Hospital, Ido Ekiti. Also, permission was taken from the authorities of the universities before going ahead with the study. Informed consent was taken from each of the participants, and confidentiality was maintained by distributing the questionnaire anonymously. Patients or the public were not involved in the design, conduct, reporting or dissemination plans of our research.

RESULTS

Sociodemographic characteristics

The mean age of the respondents in the public universities was 21.1±2.5 years with a range of 38–16 years, while

Table 1 Sociodemographic characteristics of respondents compared between public and private universities

Variables	Public N=208 N (%)	Private N=210 N (%)	χ^2	P value
Age (in years)				
<20	63 (30.0)	121 (57.6)	35.812	<0.001
20–24	124 (59.6)	84 (40.0)		
25–29	21 (10.1)	5 (2.4)		
Mean age±SD	21.1±2.5	19.3±2.1	7.861	<0.001
Age range	16–28	15–28		
Religion				
Islam	35 (16.8)	54 (25.7)	4.925	0.026
Christianity	173 (83.2)	156 (74.3)		
Marital status				
Married	12 (5.8)	7 (3.3)	1.429	0.232
Single	196 (94.2)	203 (96.7)		
Ethnicity				
Yoruba	170 (81.7)	118 (56.2)	41.771	<0.001
Hausa	14 (6.7)	18 (8.6)		
Igbo	21 (10.1)	40 (19.0)		
Others	3 (1.5)	34 (16.2)		

the mean age of the respondents in the private universities was 19.3±2.1 years with a range of 28–15 years, and this difference is statistically significant (p<0.001). More than three quarters of the university students in both public (83.2%) and private (74.3%) universities were Christians. Most students were single in both public and private (94.2% and 96.7%, respectively) universities, with more married respondents among students in public universities (5.8%) than private universities (3.3%). This difference shows no statistical significance (p=0.232) (table 1).

The ethnicity of most of the students was Yoruba (81.4%) in the public university, while in the private university, around half (56.2%) were of Yoruba ethnicity. However, while only 1.5% of the students in public universities belong to other ethnicity, about 16% of those in private universities are from other ethnicities. These differences in the ethnicity of the students in the public and private universities showed statistically significant results at a p value of <0.001 (table 1).

Prevalence of LARC usage (currently using) compared among sexually active respondents

The prevalence of LARC use among sexually exposed students in public universities was 12.5% (7.1% for implant and 5.4% for IUD), while the prevalence in private universities was 12.7% (4.8% for implant and 7.9% for IUD). There was no statistically significant difference in the prevalence between the respondents in the two university settings (p=0.970). The proportion of implant among LARC users was more in the students of public universities (57.1%) than the students of private universities (37.5%). However, IUD use was more among students using LARC in private universities (62.5%) than their public counterparts (42.9%). There exists no statistically significant difference in the proportion of implant and IUD use among LARC users in the two groups at a p value of 0.375 (table 2).

Among students using LARC in public universities, half of them had their LARC provided by doctors, 42.9% by nurses and 7.1% by community health extension workers (CHEWs). However, in a private university, half of the LARC was provided by doctors and the other half by nurses. There exists no statistically significant difference in the public and private universities as regards the source of LARC procurement (p=0.730) (table 2).

Determinants of LARC use compared between respondents from the public and private universities

Out of the assessed determinants, age (p value: 0.003), marital status (p value: 0.004) and knowledge (p value: 0.027) showed statistical significance with LARC uptake (table 3).

A binary logistic regression for the predictors of LARC uptakes in both the public and private universities

Predictors for LARC uptake among students in public universities were in the age group of 25–29 years (with p value 0.035 and about four times likely to take up contraception; AOR 4.391), being married (with p value 0.021 and about four times likely to take up contraception; AOR 4.470) and having good knowledge of LARC (with p value 0.016 and about five times likely to take up contraception; AOR 4.783), while the predictors among private university students were only limited to being married (with p value 0.007 and about 10 times likely to take up contraception; AOR 10.124) and having good LARC knowledge (with p value 0.038 and about three times likely to take up contraception; AOR 3.188) (table 4).

More than one-fourth of the students in public (29.6%) and more than one-third of the students in private (38.2%) universities were willing to take up LARC after participating in the study. There exists no statistically significant difference in the willingness to take up LARC among the two groups of female students (p=0.369). However, among those willing to take it up, the majority of them have a preference for implant (86.2% in public and 90.5% in private) than IUD. The willingness among the two university settings is not statistically significantly different (p=0.647) (table 5).

Table 2 Prevalence of long-acting reversible contraception use (currently using) compared between sexually active respondents from the public and private universities

Variable	Public N=112 N (%)	Private N=63 N (%)	χ^2	P value
Currently using LARC (implant/IUD) as a form of contraception				
Yes	14 (12.5)	8 (12.7)	0.001	0.970
No	98 (87.5)	55 (87.3)		
Currently using an implant as a form of contraception				
Yes	8 (7.1)	3 (4.8)	0.388	0.533
No	104 (92.)	60 (95.2)		
Currently using an IUD (Copper T) as a form of contraception				
Yes	6 (5.4)	5 (7.9)	0.455	0.500
No	106 (94.6)	58 (92.1)		
Proportion of implant usage among LARC users	**n=14**	**n=8**		
Yes	8 (57.1)	3 (37.5)	0.786	0.375
No	14 (42.9)	8 (62.5)		
Proportion of IUD among LARC users	**n=14**	**n=8**		
Yes	6 (42.9)	5 (62.5)	0.786	0.375
No	14 (57.1)	8 (37.5)		
Source of your LARC	**n=14**	**n=8**		
Doctor	7 (50.0)	4 (50.0)	0.629	0.730
Nurse	6 (42.9)	4 (50.0)		
CHEW	1 (7.1)	0 (0.0)		

CHEW, community health extension worker; IUD, intra-uterine device; LARC, long-acting reversible contraception.

Table 3 Determinants of long-acting reversible contraception use compared between respondents

Variables	Public N=208 N (%)	Private N=210 N (%)	Total N=418 N (%)	χ^2	P value
Age (years)					
<20	63 (30.3)	121 (57.6)	184 (44.1)	11.414	0.003
20–24	124 (59.6)	84 (40.0)	208 (49.7)		
25–29	21 (10.1)	5 (2.4)	26 (6.2)		
Mean age±SD	21.1±2.5	19.3±2.1		7.861	<0.001
Age Range	16–28	15–28			
Religion					
Islam	35 (16.8)	54 (25.7)	89 (21.3)	4.775	0.072
Christianity	173 (83.2)	156 (74.3)	329 (78.7)		
Marital status					
Married	12 (5.8)	7 (3.3)	19 (4.5)	4.775	0.004
Single	196 (94.2)	203 (96.7)	399 (95.5)		
Ethnicity					
Yoruba	170 (81.7)	118 (56.2)	288 (68.9)	3.723	0.293
Hausa	14 (6.7)	18 (8.6)	32 (7.7)		
Igbo	21 (10.1)	40 (19.0)	61 (14.6)		
Others	3 (1.5)	34 (16.2)	37 (8.8)		
Knowledge of LARC					
Good	49 (23.6)	70 (33.3)	119 (28.5)	4.904	0.027
Poor	159 (76.4)	140 (66.7)	299 (71.5)		
Fear of pain					
Yes	36 (17.3)	27 (12.9)	63 (15.1)	1.617	0.204
No	172 (82.7)	183 (87.1)	355 (54.9)		
Fear of side effects					
Yes	28 (13.5)	30 (14.3)	58 (13.9)	0.059	0.807
No	180 (86.5)	180 (85.7)	360 (86.1)		
Partner's preference					
Yes	30 (14.4)	20 (9.5)	50 (12.0)	2.382	0.123
No	178 (85.6)	190 (90.5)	368 (88.0)		
Availability at the school health					
Yes	32 (13.5)	20 (4.8)	52 (12.4)	3.295	0.069
No	176 (86.5)	190 (95.2)	366 (87.6)		
Use by colleagues					
Yes	57 (27.4)	58 (27.6)	115 (27.5)	0.002	0.961
No	151 (72.6)	152 (72.4)	303 (72.5)		

LARC, long-acting reversible contraception.

DISCUSSION

The mean age of respondents in this study was 21.1±2.5 years for public universities and higher than 19.3±2.1 years in private universities. However, both values are within the university students in Nigeria age range. This higher mean age found in the public university may indicate higher contraception needs and higher knowledge of contraception, which may help improve uptake. The findings of this study for the public university students are similar to the findings in a study on contraceptive use, the knowledge and sexual behaviour of female students in an Uganda University where 21.7 years was reported as the mean age and another study in Ethiopia where 72.4% of the college students studied for LARC utilisation are within the age range of 20–24 years.[12 35] Also, the mean age of the study in the public university of 21.1±2.5 years

Table 4 Binary logistic regression for the predictors of long-acting reversible contraception uptake

	Public		Private	
	AOR (95% CI)	P value	AOR (95% CI)	P value
Age (years)				
<20	1.000		1.000	
20–24	1.738 (0.192–15.766)	0.623	0.509 (0.070–3.716)	0.505
25–29	4.391 (1.398–48.384)	0.035	6.610 (0.631–69.259)	0.115
Marital status				
Married	4.470 (1.803–24.880)	0.021	10.124 (1.589–174.079)	0.007
Single	1.000		1.000	
Knowledge of LARC				
Good (≥50%)	4.783 (1.346–16.995)	0.016	3.188 (1.307–33.083)	0.038
Poor (<50%)	1.000		1.000	
Constant	0.029	0.001	0.052	0.008

AOR, adjusted odd ratio.

is close to the findings in a study among tertiary institutions students in Osun State, Nigeria, where a mean age of 23.6 years was documented.[5] However, the finding in the private university showed a relatively lower mean age of 19.3±2.1 years and is similar to finding among Gondar Northwest Ethiopia female students where the mean age of 19.5±1.7 years was reported, though majority of the students are within the age range of 20–24 years as against less than 20 years of age for the private group in this study.[36]

The prevalence of LARC use in this study is low among university female undergraduates across board. The prevalence rate of 12.5% among public university undergraduate students and 12.7% among private undergraduates was found. The rates among the public undergraduate university students and their private counterpart are almost equal as noted above, and the small difference observed is not statistically significant. This finding is lower than what was reported among university students in two separate studies in Ethiopia (20% and 23.4%) and among adolescents and young women in North London (28%)[12 14 36] but higher than findings among clinical students in a UK institution, community college students of Texas and female university students in Lesotho where the prevalence rates of 10%, 9% and 1%, respectively, were reported.[20 37 38] This study finding is also higher than as reported in a University of Zimbabwe's study on factors influencing the uptake of LARCs among female undergraduate students where an uptake rate of between 2.5% and 7.5% was reported for IUCD and implant, respecrively.[39] This study also found out that among the LARC users in the public university, more are on implant (57.1%) as against 42.9% on IUD. However, among the private university students, a larger percentage is on IUD (62.5%) as against implant (37.5%). The findings among public university students with higher use of implant are similar to the findings among female students of a college in Debre Berhan Town of Ethiopia with about 80% LARC users using implant and also a Zimbabwe's study that reported a higher use of implant that IUCD among the student population.[12 39] The source of LARC procurement in both universities is majorly through doctors (50% in both) and nurses (42.9% in public and 50% in private). A small percentage (7.1%) of public university students, however, procured LARC through CHEWs.

This study also found out that age (students aged 25–29 years are 4.4 times more likely to use LARC in public universities and 6.6 times more likely to use LARC in private universities compared to those aged less than 20 years), marital status (4.5 times in public and 10 times in private than single) and good knowledge of LARC (4.7 times in public and 3.2 times in private than those with poor knowledge) are statistically significant predictors to uptake of LARC among the female students in both public and private universities. This shows, therefore, that

Table 5 Willingness to take up long-acting reversible contraception (LARC) compared between respondents (who are sexually active and not on LARC) in the public and private universities

Variable	Public n=98 n (%)	Private n=55 n (%)	χ^2	P value
Willingness to use LARC				
Yes	29 (29.6)	21 (38.2)	1.996	0.369
No	36 (36.7)	21 (38.2)		
Not sure	33 (33.7)	13 (23.6)		
The one you are willing to use, if yes	**n=29**	**n=21**		
Implant	25 (86.2)	19 (90.5)	0.210	0.647
Copper	4 (13.8)	2 (9.5)		

there exist relationship between age, marital status, good LARC knowledge and LARC use.

The predictors of LARC among the students as found by this study are age, marital status and good knowledge of LARC. The findings of this study are similar to the findings of a study on factors influencing the uptake of LARC among female undergraduate university students in Zimbabwe where age, religion, marital status and knowledge of LARC were factors documented to be associated with LARC uptake.[39] It is also similar in part to findings reported among young women and adolescents in North London and among students in Gondar Ethiopia where it was marital status was reported as a predictor for LARC use.[14 36] Another study among a separate group of female college students in Ethiopia reported good knowledge of LARC as predictor for its use, similarly to one of the factors found by this study.[12]

The willingness to take up LARC among the student respondents in both study areas (public and private universities) was also assessed by this study. The willingness to take up LARC was still low among students in the two university settings with only 24% and 24.8% of the respondents willing in public and private universities, respectively, with no significant difference. This low willingness can be attached to poor knowledge, misconception about its use, access to LARC and cost of the commodity,[40] and this might improve if more students are aware and know the benefits of LARC. However, this finding is inconsistent with a study on current barriers and potential strategies to increase the use of LARC to reduce the rate of unintended pregnancies in Australia where despite multiple attempts to increase awareness, student's uptake of contraception remains low.[41] Out of those willing to take up LARC, majority (more than four-fifths) have preference for implant in both universities (82.0% in public and 86.5% in private).

The low prevalence and the less willingness to take up of LARC may lead to higher occurrence of unwanted pregnancies, unsafe abortion, complications of abortion, psychological and emotional disorders.[42] The financial burden of these consequences of unwanted unplanned pregnancy on the students and their families can also be devastating as high uptake of LARC has been documented to lead to saving of cost that is attributed to unwanted pregnacies.[42]

Strengths and limitations of this study

This study is a unique one based on the fact that it is done among students who are either adolescent or young persons and at risk of unwanted unplanned conception. It is also one of the few studies conducted on this topic among these types of study participants in sub-Saharan Africa. However, being a cross-sectional study, it can only give a snapshot finding, and a cause-and-effect relationship cannot be determined. It could also be subject to recall bias, being a questionnaire-based study.

CONCLUSION

The prevalence of LARC use is very low among female undergraduates of both public and private universities despite high sexual exposure and activities among them. The study also found that age, marital status and knowledge are predictors for the uptake of LARC among the female undergraduate students in the public university, while only marital status and knowledge are the predictors among the private university students. Furthermore, the willingness to take up LARC as a form of contraception among the students is low in both institutions.

Relevant stakeholders and government agencies are encouraged to put in place necessary awareness campaign programmes to increase the uptake of LARC so that the prevalence and adverse effects of unplanned pregnancies due to unprotected sexual exposure can be reduced.

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