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# The Determinants of Sexual Risk Behavior for HIV/AIDS among University Students in Ilishan, Nigeria

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. Author OA designed the study, performed statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author JS participated in the design of the study coordinated the data collection process and critical revision of the manuscript. Author EJ contributed to the design of the study and critical revision of the manuscript. Author EJ also managed the literature searches. All Authors read and approved the final manuscript.*

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## ABSTRACT

**Aims:** HIV in sub-Saharan Africa is closely linked to the sexual behavior of the population. The knowledge of the impact of socio- demographic and an increasing religious movement, on risk behavior for HIV/AIDS among University students in Nigeria and the rest of the sub-Saharan Africa is uncertain and even contradictory. The aim of this study was to investigate the role of socio-demographic and religious factors in determining risk behavior for HIV/AIDS among University students in Ilishan, Nigeria.

**Methodology:** This is a cross-sectional study of 1225 university students selected by probability sampling method. Data were collected using an expert validated questionnaire. Data were collected on dependent variables i.e. being sexually active, having multiple sexual partners and inconsistent condom use, and the independent variables that included demographic, social and religious factors.

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**Results:** About a quarter 24.1% of the participants were sexually active, with a higher proportion of males being sexually active ( $p=0.000$ ). Among the participants who were sexually active, 34.2% had multiple sexual partners within the preceding six months and 53.9% of them did not use condoms consistently. Males (OR=1.646), Young adults (OR=1.924), rural dwellers (OR=1.500) and practitioners of other religions (OR=2.085) were more likely to sexually active than females, Adolescents, urban dwellers and Christians respectively. Multiple sexual partnership and inconsistent condom use among the sexually active participants were not predicted by any of the independent variables.

**Conclusion:** Risk behavior for HIV/AIDS is prevalent among university students in Nigeria. While personal religious tendencies did not predict sexual activity, an environment full of regular Christian religious activities seem to reduce risky sexual behavior. There is a need for more studies especially qualitative studies to explore the effect of religious factors on the practice of multiple sexual partnership and inconsistent condom use among sexually active students.

*Keywords: Multiple sexual partners; HIV/AIDS; inconsistent condom use; religion; sexual activity.*

## 1. INTRODUCTION

In the last two decades, HIV/AIDS has been topical in the global health community. The pandemic has reversed gains in the social and health indices achieved by many countries especially in the developing world. Sub-Saharan Africa has been worst hit by the HIV pandemic with far-reaching consequences [1]. Sub-Saharan Africa accounts for more than two-thirds of all people living with HIV (PLHIV) and nearly three-quarters of all AIDS-related deaths [2,3]. In Nigeria, the highest at risk group for HIV infection are people aged 15 to 24 years who account for over 40% of all new HIV infections among adults [4]. This has greatly hindered development and negatively affected all aspects of life in the region.

In worst hit areas, where quick and effective responses mitigated the impact of the pandemic, an unusual openness in acknowledging sexual behavior as the root of the epidemic has been credited with the broad mobilization of the voluntary sector, especially through the activities of faith-based organizations [5-7]. The open discussion of sexuality did not seem to prevent religious institutions from supporting the preventive efforts, which were based on the ABC strategy: Abstinence, Being faithful to one's partner, and using Condoms [5,8].

The main route of transmission of HIV infection in sub-Saharan African is through the heterosexual means [9]. Studies have shown that although, several factors contribute to the HIV epidemic in sub-Saharan Africa, behavioural factors are the major contributors to the transmission of HIV infection. These include indiscriminate and unprotected sexual intercourse, presence of other sexually-transmitted infections, transactional sex and male circumcision [1,10]. HIV infection in sub-Saharan Africa is closely linked to the sexual behavior of the population; hence, the main thrust of HIV prevention programs has been safer sexual practices. Empirical evidence has also shown an association between decline of HIV prevalence and changes in sexual behaviour [11]. Such efforts reduced the prevalence of HIV/AIDS in the adult population [12].

If these gains are to be sustained, it is logical to target the young population for HIV/AIDS prevention. This group represents the most sexually active part of the population often

having multiple sexual partners and as generally agreed, a sector that is highly sensitive to changes in behaviors—particularly sexual ones [1,5]. Adolescence and youth are well known periods for sexual risk taking [13]. Young people are impressionable and easy to reach with preventive interventions through the institutions where they spend a considerable proportion of their time. Schools are the most likely arena for initiating sexual contacts [5], it is therefore important to determine the factors that underline sexual behaviors in school settings. University students' population potentially represents the expanding middle class and has been the scene of growing activity by religious movements [5,14].

Studies of the relationship between sexual behaviors and the socio-demographic characteristics among students reveal diverse patterns [15,16]. A few studies have determined the association between religion and sexual behavior among young people in sub-Saharan Africa [14,17,18]. Religion was found to be a predictor of sexual abstinence in Zimbabwe and Côte d'Ivoire [18,19] but there was no association between religion and sexual behavior among university students in Nigeria [17]. Whereas, in a Ugandan university, more than half of twenty-five students interviewed who were members of a Pentecostal Church had engaged in sexual activity after being "born-again" [5,14]. This shows that the effect of religion on sexual behavior of young individuals is likely to be related to other contextual factors and should therefore be assessed separately for settings with similar characteristics, i.e., by country or by region [5].

The effect of the tendency towards more active religious conservatism or fundamentalism has been examined [14]. This is of particular of interest because certain religious organizations have increasingly challenged the ABC strategy, especially the condom use component [20].

The knowledge of the role of socio- demographic and an increasing religious movement in determining risk behavior for HIV/AIDS among university students in Nigeria and the rest of the sub-Saharan Africa is uncertain and even contradictory. The aim of this study was to investigate the role of socio-demographic and religious factors in determining risk behavior for HIV/AIDS among University students in Ilishan, Nigeria.

## **2. MATERIALS AND METHODS**

### **2.1 Study Setting and Sampling**

A cross-sectional study conducted at Babcock University, Ilishan Nigeria. Babcock University is a private Christian co-educational Nigerian University owned and operated by the Seventh-day Adventist Church in Nigeria. The university has strong traditions that include the centrality of faith-based teaching and the emphasis on abstinence among unmarried youth as the way to prevent HIV/AIDS. Babcock University is one of the 51 private universities in Nigeria [21]. The University has total of 8000 regular undergraduate students.

One thousand two hundred and fifty participants were targeted to increase validity of the study. The University is almost fully residential with 15 student hostels on the two campuses (12 in Ilishan and 3 in Iperu). Five hostels were selected by simple random technique via balloting (one in Iperu and four in Ilishan). Proportional allocation was used to decide the required sample size for each hostel. The students were then selected from each hostel using stratified sampling from a serially numbered list of students in each hostel. The total number of students in each hall was divided by the allocated sample size to arrive at the

sampling fraction. The first enrollee was selected by simple random sampling by balloting from the first fraction on the list. The subsequent enrollees were then chosen from the list by adding the sample fraction to the first number chosen and so on. Enrolment as a student of the institution for a minimum of six months was a pre-requisite for participation in the study.

## **2.2 Measurement**

Data were collected using self-administered questionnaire under the supervision of the investigators. Data were collected on the dependent variables i.e. being sexually active, having multiple sexual partners and inconsistent condom use, and the independent variables including socio demographic, knowledge related to HIV/AIDS transmission and prevention, self-reported academic performance, frequency of religious worship attendances and communication with parents about sexual issues. The questionnaire was designed after literature search, validated by a team of three Reproductive Health Specialists. Stability and reliability of the questionnaire was assessed by the test-retest reliability method which was carried out among 50 undergraduate students in a public university; two weeks apart ( $r=0.8$ ). The questionnaire was pretested among 125 students of a public university in Nigeria. Questionnaire administration was done during the monthly fellowship meetings which are compulsory for all students.

The questionnaire assessed social and demographic factors (such as religious affiliation and observance, place of residence); lifestyle factors (alcohol consumption); parental communication about sexual issues and sexuality.

## **2.3 Definition of Variables**

### **2.3.1 Independent variables**

Two age groups were defined for analysis: "< 20 years old (Adolescents)" and "≥ 21 years old (Young Adults)". Place of residence was dichotomized into "rural" and "urban". The religion was reported by selecting one of the following alternatives: "Christianity", "Islam" and "Others". In the logistic regression analysis, reporting was done using "Christian" and "Others". Religious observance was dichotomized, and coded as "not quite religious (attending worship less than or equal to twice a month)" and "relatively religious (attending worship more than twice a month)". The worship attendance was related only to periods when the students were at home with their parents on holidays. Communication with parents about sexual issues was dichotomized into "poor" and "good". The source of information about HIV/AIDS was dichotomized into "mass media" and "other" for the logistic regression analysis. The participants' self reported academic performance was coded as "below average" and at "least average" while their communication with parents about sexual issues was coded as "poor" and "good".

### **2.3.2 Outcome variables**

The variable for being sexually active was defined as "yes" or "no", based on responses to the question: "Did you have sexual intercourse in the last six months?" Multiple sexual partnerships were defined by responses to the question: "Have you had more than one sexual partner in the last six months?" The students could answer by choosing one of two options: "yes", or "no". Condom use with partner was measured by responses to the

question: "Did you use a condom all the time with all your sexual partners in the last six months?" The students could answer by choosing one of two options: "yes", or "no".

## 2.4 Statistical Methods

The statistical analysis was done using IBM SPSS software Version 20. The association independent variables and gender were tested using the Chi-square test upon which the  $p$ -values shown in Table 1 were based. The association between risk behaviors for HIV/AIDS and gender were also tested using the Chi-square test. The  $p$ -values shown in Table 2 were based on this. The associations between the independent and outcome variables were tested using the Chi-square test. The  $p$ -values shown in Table 3 were based on this.

Multivariate logistic regression was used to investigate the association between independent and outcome variables. OR and 95% CI were used as measures of association.

## 4. RESULTS AND DISCUSSION

### 4.1 Results

A total of 1225 students accepted to participate in the study and returned duly filled questionnaires. This represented a response rate of 98%. There were more female participants (57.7%) than males (42.3%).

Table 1 shows the distribution of the independent variables and their relationship with gender among the participants. The participants were predominantly single; Christians, relatively religious urban dwellers who reported their academic performance as being at least average. About two thirds (64.3%) of them were adolescents. They were universally aware of HIV/AIDS with the mass media being the most predominant source of information about HIV/AIDS (73.7%). There was significant association between participants' place of residence, self reported academic performance and gender. More females dwelled in urban areas ( $p=0.000$ ) and reported academic performance as being at least average than males ( $p=0.000$ ). There was no statistically significant association between the other independent variables and gender ( $p>0.05$ ).

Table 2 shows that 24.1% of the participants were sexually active, with a higher proportion of males being sexually active ( $p=0.000$ ). Among the participants who were sexually active, 34.2% had multiple sexual partners within the preceding six months and 53.9% of them did not use condoms consistently. There was no statistically significant difference among male and females as it relates to the practice of multiple sexual partnership and inconsistent condom use. Only 2.3% reported ever having sexually transmitted infections (STI). There was no significant relationship between history of STI and gender ( $p=0.137$ ). About a quarter (23.0%) of the participants reported that they shared sharps (Clippers, needles, blades etc.). This practice was found to be significantly ( $p=0.007$ ) higher in males (26.8%) than in females (20.2%). Concerning the participants' risk perception of HIV/AIDS, 21.3% perceive that they were at risk of HIV infection while 29.6% of them drank alcohol. The practice of taking alcohol was found to be significantly ( $p=0.000$ ) higher in males (34.9%) than in females (25.7%) whereas; there was no statistically significant relationship between risk perception of HIV/AIDS and gender ( $p=0.710$ ). A slight majority of the participants reported communication with their parents about sexual issues as being poor (52.6%). There was no significant relationship between history of parental communication and gender ( $p=0.439$ ).

**Table 1. Gender disaggregated distribution of Babcock University Students according to selected social, demographic and religious characteristics; January 2014 (n=1225)**

<b>Variable</b>	<b>All Frequency (%)</b>	<b>Male Frequency (%)</b>	<b>Female Frequency (%)</b>	<b>P-value</b>
<b>Gender</b>				
Male	518 (42.3)			
Female	707 (57.7)			
<b>Age in years</b>				
Adolescents	788 (64.3)	325 (62.7)	463 (65.5)	0.321
Young Adults	437 (35.7)	193 (37.3)	244 (34.5)	
<b>Marital status</b>				
Single	1219 (99.5)	514 (99.2)	705 (99.7)	0.248
Married	6 (0.5)	4 (0.8)	2 (0.3)	
<b>Residence</b>				
Rural	163 (13.3)	101 (19.5)	62 (8.8)	0.000
Urban	1062 (86.7)	417 (80.5)	645 (91.2)	
<b>Religion</b>				
Christianity	1146 (93.6)	494 (95.4)	652 (92.2)	0.085
Islam	70 (5.7)	21 (4.1)	49 (6.9)	
Others	9 (0.7)	3 (0.3)	6 (0.8)	
<b>Observance of religious worship</b>				
not quite religious	134 (10.9)	63 (12.2)	71 (10.0)	0.240
relatively religious	1091 (89.1)	455 (87.8)	636 (90.0)	
<b>Source of Information about HIV/AIDS</b>				
Mass media	903 (73.7)	365 (70.5)	538 (76.1)	0.084
Health workers	269 (22.0)	127 (24.5)	142 (20.1)	
Others	53 (4.3)	26 (5.0)	27 (3.8)	
<b>Self-reported academic performance</b>				
Below average	81 (6.6)	51 (9.8)	30 (4.2)	0.000
At least average	1144 (93.4)	467 (90.2)	677 (95.8)	
<b>Communication with parents about sexual issues</b>				
poor	644 (52.6)	279 (53.9)	365 (51.6)	0.439
good	581 (47.4)	239 (46.1)	342 (48.8)	

Table 3 shows the relationship between the independent and outcome variables. A higher proportion of young adults were sexually active than adolescents ( $p=0.000$ ). The other factors that were significantly associated with being sexually active were marital status ( $p=0.000$ ), place of residence ( $p=0.004$ ), Religion ( $p=0.009$ ), observance of religious worship ( $p=0.022$ ) and communication with parents about sexual issues (0.046). Sexual activity was not significant associated with Source of Information about HIV/AIDS and self reported academic performance ( $p>0.05$ ). Among the participants who were sexually active, none of the independent variables showed statistically significant relationship with the practices of having multiple sexual partners and inconsistent condom use.

Table 4 shows the result of multivariate logistic regression analysis. Sexual activity was predicted by gender, age group, place of residence and religion. Males (OR=1.646), Young adults (OR=1.924), rural dwellers (OR=1.500) and practitioners of other religions OR= (2.085) were more likely to sexually active than females, Adolescents, urban dwellers and Christians respectively. Multiple sexual partnership and inconsistent condom use among the sexually active participants were not predicted by any of the independent variables.

**Table 2. Gender disaggregated distribution of HIV related risk behavior among Babcock University students; January 2014**

Variable	All	Male	Female	P-value
	Frequency (%)	Frequency (%)	Frequency (%)	
Sexually active Ever had sex (1225)	295 (24.1)	155 (29.9)	140 (19.8)	0.000
Multiple sexual partner in the last six months (295)	101 (34.2)	57 (36.8)	44 (31.4)	0.334
Inconsistent condom use in the last six months (295)	159 (53.9)	81 (52.3)	78 (55.7)	0.552
Ever had sexually transmitted infection (1225)	28 (2.3)	8 (1.5)	20 (2.8)	0.137
Sharing of sharps, needles, clippers, blades, sharps etc.	282 (23.0)	139 (26.8)	143 (20.2)	0.007
poor/no HIV/AIDS risk perception (1225)	964 (78.7)	405 (78.2)	559 (79.1)	0.710
Alcohol Consumption (1225)	363 (29.6)	181 (34.9)	182 (25.7)	0.000
poor/no parental communication about sexual issues	644 (52.6)	279 (53.9)	365 (51.6)	0.439

## 4.2 Discussion

The preponderance of female participants in the study is reflective of the higher proportion of female students in Babcock University. This is contrary to the known gender tilt in access and participation in University education towards males [22]. However, it is established that institutions in Africa are admitting an increasing proportion of female students [23,24].

Behavioral risk factors for HIV are related to having sex in whichever form and to substance use including alcohol. Other risk factors relate to age, gender, occupation and income of individuals. This study demonstrated a prevalence of risk behavior for HIV infection which was either worse among males or equally distributed between males and females. The practice of being sexually active was also found to be significantly associated with certain demographic, religious and social factors. However, this study did not show significant association between demographic, religious and social factors on one hand and multiple sexual partnership and inconsistent condom use among the sexually active participants.

The results of our study indicated that the proportion of students who were sexually active was relatively low compared to other universities [17,25]. The findings of this study have some agreements with previous studies in settings outside Africa and in East Africa where it was concluded that male gender, older age and living in the rural setting were predictors of being sexually active but the finding that not being religious was not a predictor of sexual activity is an unusual one [5,26-29]. A study carried out in the USA focused on the associations between four religious dimensions (personal devotion, personal conservatism, institutional conservatism and participation in a religious community) and sexual behavior revealed that religious dimensions were variously self-identified with sexual behavior. Three of the four dimensions (personal devotion, frequent attendance, and institutional conservatism) were linked to a lower number of sexual partners in the previous year; however, young women who associated with personal conservatism tended to have a higher number of partners. However, no association with any of the four religious dimensions was found regarding abstinence [5,28]. Religion does moderate sexual activity. Our study found that while being a Christian is protective factor for sexual activity, being religious is not. Participation in Christian religious activities in Babcock University is mandatory for all

students irrespective of their religion and their personal tendency to participate in religious activities. It is likely that these activities have actually moderated the sexual behavior of the students leading to relatively lower rate of sexually active students. This suggests that a Christian environment promotes sexual inactivity irrespective of young peoples' individual sexual tendency.

A number of studies, like this one, have also demonstrated a high level of risk sexual behavior among young people. The practice of multiple sexual partnership and inconsistent condom use is common among young people [29-32]. However, unlike our study, a number of factors have been demonstrated to predict risky sexual behaviors. These include gender, alcohol and substance abuse, religion and religious participation, HIV prevention information and behavioral skills [5,30-32]. While many of these studies investigated the predictors of multiple sexual partnership and inconsistent condom use among the general population of young people and university students, our study focused on the sexually active University students.

### **4.3 Implication for Policy and Research**

In view of the prevalence of risk behavior for HIV/AIDS among Babcock University Students, there is a need for comprehensive school based strategies to promote behavioral skills that mitigate risky sexual behavior. Since it has been shown to predict sexual inactivity, Christian religious activities should continue to be encouraged where feasible. This should be augmented by deliberate health education intervention targeted against risky sexual behaviors. There is a need for more studies on the effect of religion and religious activities on sexual risk behaviors for HIV/AIDS among young people in Nigeria. Qualitative researches to explore the predictors of multiple sexual partnership and inconsistent condom use among sexually active Babcock University Students are recommended.

### **4.4 Limitations of the Study**

Our findings should be interpreted in relation to its target group, and its generalization to all individuals of the same age should be made with some caution. The majority of these university students have grown up in a more protected environment than many others in their age group. More than eighty five percent of the students reside in urban areas whereas; only 49.6% of the general Nigerian population lives in urban areas [33]. The university students were mainly unmarried.

This study design was cross-sectional; hence, ascertaining causality between the variables analyzed may be difficult. We could not rule out the possibility that some of the participants falsely reported sexual behavior that would be viewed as socially desirable or undesirable as the case may be. If this were the case, it could have lead to misclassification and, in such a case, would most likely distort the findings. The participants were guaranteed anonymity, and the questionnaires were filled in an environment that ensured confidentiality.



**Table 3. Association between selected participants' characteristics and sexual risk behavior for HIV/AIDS among Babcock University students; January 2014**

Variables	Sexual activity		Multiple sexual partnership		Inconsistent condom use	
	Frequency (%)	P-value	Frequency (%)	P-value	Frequency (%)	P-value
<b>Gender</b>						
Male	155 (29.9)	0.000	57 (36.8)	0.334	81 (52.3)	0.552
Female	140 (19.8)		44 (31.4)		78 (55.7)	
<b>Age in years</b>						
Adolescents	154 (19.5)	0.000	50 (32.5)	0.503	80 (51.9)	0.483
Young Adults	141 (32.3)		51 (36.2)		79 (56.0)	
<b>Marital Status</b>						
Single	289 (23.7)	0.000	100 (34.6)	0.668	153 (52.9)	0.032
Married	6 (100.0)		1 (16.7)		6 (100.0)	
<b>Residence</b>						
Rural	54 (33.1)	0.004	24 (44.4)	0.080	28 (51.9)	0.739
Urban	241 (22.7)		77 (32.0)		131 (54.4)	
<b>Religion</b>						
Christianity	266 (23.2)	0.009	89 (33.5)	0.094	142 (53.4)	0.864
Islam	24 (34.3)		8 (33.3)		14 (58.3)	
Others	5 (55.6)		4 (80.0)		3 (60.0)	
<b>Observance of religious worship</b>						
not quite religious	43 (32.1)	0.022	18 (41.9)	0.254	22 (51.2)	0.697
relatively religious	252 (23.1)		83 (32.9)		137 (54.4)	
<b>Source of Information about HIV/AIDS</b>						
Mass media	207 (22.9)	0.279	70 (33.8)	0.888	111 (53.6)	0.888
Health workers	73 (27.1)		25 (34.2)		39 (53.4)	
Others	15 (28.3)		6 (40.0)		9 (60.0)	
<b>Self-reported academic performance</b>						
Below average	21 (25.9)	0.688	9 (42.9)	0.388	11 (52.4)	0.885
At least average	274 (24.0)		92 (33.6)		148 (54.0)	
<b>Communication with parents about sexual issues</b>						
Poor	170 (26.4)	0.046	58 (34.1)	0.960	98 (57.6)	0.132
Good	125 (21.5)		43 (34.4)		61 (48.8)	

Table 4. Predictors of sexual risk behavior among Babcock University students; January 2014

<b>Variables</b>	<b>Sexual activity OR (95%CI)</b>	<b>Multiple sexual partnership OR (95%CI)</b>	<b>Inconsistent condom use OR (95%CI)</b>
<b>Gender</b>			
Male	1.646 (1.249-2.171)	1.222 (0.743-2.012)	
Female			1.174 (0.731-1.886)
<b>Age in years</b>			
Adolescents			
Young Adults	1.924 (1.462-2.531)	1.394 (0.839-2.316)	1.064 (0.659-1.718)
<b>Marital Status</b>			
Single		3.538 (0.392-31.940)	
Married	3E+009 (0.000-)		1E+009 (0.000-)
<b>Residence</b>			
Rural	1.500 (1.031-2.182)	1.697 (0.894-3.221)	
Urban			1.084 (0.578-2.034)
<b>Religion</b>			
Christianity			
Others	2.085 (1.256-3.463)	1.440 (0.639-3.246)	1.183 (0.526-2.663)
<b>Observance of religious worship</b>			
not quite religious	1.405 (0.930-2.122)	1.376 (0.691-2.740)	1.262 (0.640-2.487)
relatively religious			
<b>Source of Information about HIV/AIDS</b>			
Mass media			
Others	1.168 (0.864-1.578)	1.041 (0.606-1.788)	1.017 (0.607-1.707)
<b>Self-reported academic performance</b>			
Below average	1.065 (0.623-1.821)	1.216 (0.482-3.067)	
At least average			1.037 (0.418-2.575)
<b>Communication with parents about sexual issues</b>			
Poor	1.243 (0.945-1.637)	1.108 (0.669-1.836)	1.510 (0.934-2.442)
Good			

## 5. CONCLUSIONS

Risk behavior for HIV/AIDS is prevalent among university students in Nigeria. There are identifiable predictors of being sexually active which can be targeted for design of intervention to mitigate the spread of HIV/AIDS among University students. While personal religious tendencies did not predict sexual activity, an environment full of regular Christian religious activities seem to reduce risky sexual behavior. There is a need for more studies especially qualitative studies to explore the effect of religious factors on the practice of multiple sexual partnership and inconsistent condom use among sexually active students.

## ETHICAL ISSUES

Ethical clearance and permission was obtained from the Babcock University Teaching Hospital Ethical Committee. Prior to the administration of questionnaire, the purpose of the study and how to fill the questionnaire was explained to the students. The students were free to decline participation in the study. Informed consent was obtained from each student. The investigators and research assistants ensured quietness and privacy while the questionnaires were being filled out. The completed questionnaires were to be turned in anonymously.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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