

# Effect of mass media and Internet on sexual behavior of undergraduates in Osogbo metropolis, Southwestern Nigeria

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**Introduction:** The influence of media portrayals of sexual attitudes and normative expectations of young people at a critical developmental stage is of public health concern.

**Objectives:** To examine the role of mass media and Internet utilization in shaping the sexual health attitudes and behaviors of young undergraduates in Osogbo metropolis, Osun State, Nigeria.

**Materials and methods:** In a descriptive cross-sectional study, 400 undergraduates were selected using a multistage random sampling technique. Four hundred and fifty pretested, semistructured questionnaires were distributed; of these, 400 were returned properly filled. Data were analyzed using SPSS statistical software version 16.

**Results:** Mean age of respondents  $\pm$  standard deviation was 23.6 $\pm$ 2.99 years. Most were aware of the various forms of mass media (>95%). Most (64.0%) respondents spent 1–5 hours watching television, daily, and most used the Internet often. About 38.3% and 24.2% of respondents used the Internet and radio/television, respectively, as sources of information on sexual issues. Most respondents used the Internet for school assignments (83.0%, n=332), electronic mail (89.0%, n=356), and for accessing sexually explicit materials (74.5%, n=298). Most of the respondents (73.5%) opined that the Internet has a bad influence on youths' sexual behavior, although accessing the Internet for sexual material or movies was acceptable to 25.3% of them. Of the 226 respondents who had ever had sex, 226 (100%), 37 (16.4%), 31 (13.7%), and 10 (4.4%) practiced coitus, oral sex, masturbation, and anal sex, respectively; 122 (54.0%) always used condoms, whereas 90 (40.0%) never used condoms during sexual activity; 33 (14.6%) had had sex with commercial sex workers. Further analysis showed that those who were yet to marry (single) were less likely to be sexually experienced than those who were married (adjusted odds ratio [AOR] =0.075, 95% confidence interval [CI] =0.008–0.679), and those who said accessing the Internet for sexual material is not acceptable to them were also less likely to be sexually experienced than those to whom it was acceptable (AOR =0.043, 95% CI =0.016–0.122). Predictors of having multiple sexual partners include the sex of the respondent and the frequency of Internet use, with females (AOR =0.308, 95% CI =0.113–0.843) and those who rarely use the Internet less likely to have multiple sexual partners.

**Conclusion:** We conclude that uncontrolled exposure to mass media and Internet could negatively influence the sexual patterns and behavior of youths.

**Keywords:** mass media, Internet, sexual behavior, undergraduates

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## Introduction

Mass media is defined as those media that are designed to be consumed by large audiences through the agencies of technology.<sup>1,2</sup> An array of communication media reaches large numbers of the public, including radio, television, movies, newspapers,

and magazines. The Internet is a worldwide, publicly accessible network of interconnected computer networks that transmits information and services such as electronic mail, online chat, file transfer, interlinked web pages, and other documents of the World Wide Web.<sup>3</sup>

Media influences on sexual behavior were first reported in a sex education newsletter in 1981,<sup>4</sup> and since then several overviews have examined adolescents' use of media as a source of information and its possible effect on their sexual behavior.<sup>5–8</sup> Adolescents are vigorous users of the information broadcast in the media,<sup>9</sup> and concern has been raised about the influence of media portrayals on sexual attitudes and the normative expectations of these adolescents at a critical developmental stage.<sup>10</sup> The mass media and the Internet have their advantages in terms of providing necessary information for young people on sexual health and healthy sexual relationships,<sup>3</sup> but many studies have shown that mass media negatively influences teens in their sexual behaviors.<sup>1,9,11,12</sup> Over the past two decades, studies have shown an overall increase in the number of portrayals of and the amount of discussion about sex in these media and an increase in the explicitness of these portrayals.<sup>13–16</sup> Furthermore, television research shows a fairly consistent sexual message across television genres: most portrayals of sex depict or imply sexual intercourse between unmarried adults, with little or no reference to sexually transmitted infections or acquired immunodeficiency syndrome (AIDS), pregnancy, or use of contraception.<sup>17</sup>

Sexual discussions and displays are increasingly frequent and explicit in all forms of the mass media.<sup>3</sup> The Internet, the use of which is growing more rapidly than any previous technology,<sup>18</sup> has dramatically increased the availability of sexually explicit content.<sup>3</sup> One content analysis found that the inclusion of sexual content that ranged from flirting to sexual intercourse had increased from slightly more than half of television programs in 1997–1998, to more than two thirds of the programs in the 1999–2000 season. Depictions of intercourse (suggestive or explicit) occurred in one of every ten programs.<sup>19</sup> A US study examining 1,276 youth-directed programs broadcast in 2001–2002 showed that 82% of episodes featured sexual talk and 67% featured sexual behavior, with 11% implying, and 4% portraying sexual intercourse.<sup>20</sup>

Little is known, however, of the relationship between the media and young people's sexual behavior in Nigeria, or indeed in developing countries in general, because of the dearth of studies in this area. The alarming increase of rape, teenage pregnancies, septic abortions, and sexually transmitted infections, especially human immunodeficiency

virus (HIV), among undergraduates in Nigeria<sup>21</sup> makes research into the effects of the mass media and the Internet on their sexual behavior even more important.

## Materials and methods

This descriptive, cross-sectional study was carried out in Osogbo, the capital of Osun State, Nigeria; the target population was undergraduates in Osogbo metropolis. The town has three universities: Ladoke Akintola University of Technology Teaching Hospital (LAUTECH); Fountain University; and Osun State University. Questionnaires were administered to students at two randomly selected schools within the Universities; the lower-level medical students of Osun State University, and the upper-level basic medical laboratory science students at LAUTECH. Ethical approval to conduct this study was obtained from the Research Ethics Committee of LAUTECH, and further permission was sought and obtained from the Provost, College of Health Sciences, Osun State University, authorizing us to conduct the survey there also. In addition, verbal informed consent was obtained from each respondent.

A multistage sampling technique was used to select the respondents. An initial sample size of 340 was arrived at using the Leslie Fischer's formula for populations smaller than 10,000.<sup>22</sup> However, to increase representativeness and to remedy for nonresponse, a total of 450 pretested semistructured questionnaires were distributed. This self-administered questionnaire was divided into four sections. The first section comprised sociodemographic characteristics of respondents; the second section dealt with awareness of and use of various forms of mass media; the third section examined patterns of sexual behavior of respondents; and the last section dealt with respondents' attitudes about, and use of the Internet and its effects, especially on sexual behaviors.

The questionnaires were manually sorted and analyzed using SPSS statistical software, version 16 (IBM Corporation, Armonk, NY, USA). The validity of the data collected was ensured by double entry and by random checks for errors. Relevant frequency distribution tables and summary measures were generated. The chi-square test was used to demonstrate relationships between categorical variables, and the level of significance was set at  $P < 0.05$ , and a 95% confidence interval (95% CI), for all inferential analyses. Logistic regression analysis was used to identify predictors of being sexually experienced (that is, those who have ever had sex) and of having multiple sexual partners. In the logistic regression tables, number of television viewing hours was regrouped into two groups of "less than" or "equal to and more than" the mean viewing hours.

Outcome variables for the attitudes of respondents were scored using a five-point Likert scale (strongly agree, agree, undecided, disagree, strongly disagree). These ratings were compressed to agree, undecided, and disagree in the logistic regression tables.

## Results

Of the 450 questionnaires distributed, 400 completed questionnaires were returned, resulting in a response rate of 88.9%. Table 1 shows the sociodemographic characteristics of the 400 respondents. Most were between 20–24 years of age (59.5%) and 25–29 years of age (32.8%), with a mean age  $\pm$  standard deviation of 23.6 $\pm$ 2.99 years; the respondents were mainly female (n=227, 56.8%), Christian (n=303, 75.8%), and single (n=372, 93.0%).

Most of the respondents were aware of the various forms of mass media, such as radio and television (99.5%), films (95.0%), newspapers and magazines (96.5%), home videos (videos viewed at home) (91.0%), and the Internet (98.7%)

(Table 2). Radio and television were the most accessible to respondents (n=88, 22.0%), followed by the Internet (n=60, 15.0%). Many of the respondents were of the opinion that the Internet and radio/television were sources of information on sexual issues (n=153, 38.3% and n=97, 24.2%, respectively), whereas more respondents (n=165, 41.3%) felt that the Internet had effects on sexual behavior, compared with other forms of mass media. Films were the favorite types of television programming for more than half of the respondents (56.3%), and about a third of respondents (n=134, 33.5%) spent an average of 3–5 hours daily watching the television (Table 3). Most of the respondents (n=263, 65.8%) had heard about the Internet from friends. Almost half of the respondents (n=198, 49.5%) used the Internet often, for such purposes as school assignments (n=332, 83.0%), email (n=356, 89.0%), and accessing sexually explicit materials (n=298, 74.5%). Of the 298 who accessed sexually explicit materials on the Internet, 56 (18.8%) did so often, 53 (17.8%) occasionally, and 189 (63.4%) rarely.

Regarding attitudes toward mass media and the Internet, most respondents disagreed or strongly disagreed that premarital sex (57.3%) and accessing the Internet for sexual materials (61.8%) were acceptable behaviors, and most agreed or strongly agreed that the Internet has a bad influence on youths' sexual behavior (73.5%) (Table 4). After scoring of outcome variables, 58.9% of respondents had negative attitudes and 41.1% had positive attitudes towards the mass media/the Internet and their sexual behavior.

Table 5 shows the sexual behavior patterns of respondents. Most of the respondents were aware of various forms of sexual behaviors, such as masturbation (89.2%), oral sex (88.0%), anal sex (84.7%), and coitus (100%); and 226 of them (56.5%) had experienced sexual intercourse. Of the 226 sexually experienced respondents, 226 (100.0%), 37 (16.4%), 31 (13.7%), and 10 (4.4%) practiced coitus, oral sex, masturbation, and anal sex, respectively; 122 (54.0%) always used condoms during sexual activity, whereas 90 (40.0%) never used condoms; 33 (14.6%) had had sex with commercial sex workers. About half of the respondents (n=117, 51.8%) first had sexual intercourse between 15–19 years of age, and most (n=171, 75.7%) had 1–2 sexual partners currently.

Most of the respondents (n=371, 92.8%) felt that mass media/the Internet had an effect on their sexual behavior, with 198 (49.5%) of them agreeing it had both positive and negative effects. Bivariate analysis of the outcome variables showed significant association between being sexually active and the respondents' age ( $P=0.001$ ), sex ( $P=0.004$ ), marital status ( $P=0.01$ ), time spent daily watching

**Table 1** Sociodemographic characteristics of respondents (n=400)

Variables	n	(%)
Age groups (years)		
Less than 20	17	4.2
20–24	238	59.5
25–29	131	32.8
30 and above	14	3.5
Sex		
Female	227	56.8
Male	173	43.2
Religion		
Christianity	303	75.8
Islam	92	23.0
Traditional	4	1.0
Others	1	0.2
Marital status		
Ever married	28	7.0
Yet to marry (single)	372	93.0
Ethnicity		
Yoruba	324	81.0
Igbo	69	17.2
Hausa	7	1.8
Level in school		
Lower level†	156	39.0
Upper level††	244	61.0
Secondary school attended		
Private	220	55.0
Public	180	45.0
Place of residence		
Rural	46	11.5
Urban	354	88.5

**Notes:** †Lower level includes first-year to third-year students; ††upper level includes fourth-year and fifth-year students.

**Abbreviation:** n, number.

**Table 2** Perceptions of respondents about mass media/the Internet (n=400)

Variables	Radio and television n (%)	Films n (%)	Newspapers and magazines n (%)	Home video n (%)	Internet n (%)
Awareness	398 (99.5)	380 (95.0)	386 (96.5)	364 (91.0)	395 (98.7)
Readily accessible	388 (97.5)	218 (54.5)	90 (22.5)	400 (100.0)	260 (65.0)
Personal favorite	99 (24.8)	94 (23.5)	22 (5.5)	56 (14.0)	120 (30.0)
Source of information on sexual issues	97 (24.2)	46 (11.1)	37 (9.2)	67 (16.8)	153 (38.3)
Has effects on sexual behavior	72 (18.0)	57 (14.3)	17 (4.2)	89 (22.2)	165 (41.3)

**Abbreviation:** n, number.

television ( $P=0.03$ ), frequency of Internet use ( $P=0.0003$ ), and frequency of accessing sexually explicit materials on the Internet ( $P=0.001$ ) (Table 6).

In the analysis of possible predictors of being sexually experienced (Table 7), for the variable “accessing Internet for sexual material/movies is acceptable to me” and using “agree” as the reference, respondents who stated that accessing Internet for sexual material/movies was not acceptable to them were 23 times (1/0.043) less likely to be sexually active (experienced) than those who stated that accessing

the Internet for sexual material/movies was acceptable; this finding was statistically significant for “disagree” (odds ratio [OR] =0.043, 95% CI =0.016–0.122,  $P<0.001$ ).

Similarly, for the variable “marital status” and using “ever married” as the reference, those who were single (yet to marry) were about 13 times (1/0.075) less likely to be sexually active than those who were married, and this finding was also statistically significant (OR =0.075, 95% CI =0.008–0.679,  $P=0.021$ ). Thus, predictors of level of sexual activity were the attitude “accessing the Internet for sexual material/movies is acceptable to me” and respondents’ marital status.

In the analysis of possible predictors for having multiple sexual partners (Table 8), for the variable “sex” and using “male” as the reference, females were about three times (1/0.308) less likely to have multiple sexual partners than males, and this was statistically significant (OR =0.308, 95% CI =0.113–0.843,  $P=0.022$ ).

For the variable “frequency of Internet use” and using “rarely” as the reference, those who used the Internet often were about five and a half times (1/5.450) more likely to have multiple sexual partners than those who rarely used the Internet, and this finding was statistically significant (OR =5.450, 95% CI =1.035–28.703,  $P=0.045$ ). Similarly, for the same variable and using “rarely” as the reference, those who used Internet occasionally were about seven times (1/7.295) more likely to have multiple sexual partners than those who rarely used the Internet, and this finding also was statistically significant (OR =7.295, 95% CI =1.085–49.040,  $P=0.041$ ).

## Discussion

Almost all the respondents in this study were aware of the Internet and the mass media, with more than 9 of 10 respondents knowing about the various forms of mass media. This is similar to what has been reported in earlier studies,<sup>1,3</sup> and it is expected because young people have been said to be vigorous users of the mass media.<sup>9</sup> Only about a fifth of the students in this study had ready access to radio and television, and even fewer (15%) had ready access to the Internet.

**Table 3** Use of mass media/the Internet by respondents (n=400)

Variables	n (%)
Favorite programs on television	
Films	225 (56.3)
News and documentaries	98 (24.5)
Sports	22 (5.5)
Education	55 (13.7)
Average amount of time spent watching television daily (hours)	
0–2	122 (30.5)
3–5	134 (33.5)
More than 5	85 (21.2)
No response	59 (14.8)
Source of knowledge about the Internet	
Friends	263 (65.8)
Parents	13 (3.3)
School	93 (23.2)
Others	31 (7.7)
Reasons for Internet use (multiple responses allowed)	
School assignments	332 (83.0)
Email	356 (89.0)
Sports	164 (41.0)
Sex movies and pornography	298 (74.5)
News	196 (49.0)
Frequency of Internet use*	
Often	198 (49.5)
Occasionally	116 (29.0)
Rarely	86 (21.5)
Frequency of accessing sexually explicit materials (n=298)*	
Often	56 (18.8)
Occasionally	53 (17.8)
Rarely	189 (63.4)

**Note:** \*Often indicates daily to weekly use; occasionally indicates once or twice a month; and rarely indicates once in two to three months.

**Abbreviation:** n, number.

**Table 4** Attitudes of respondents to mass media/the Internet (n=400)

Variables	Strongly agree n (%)	Agree n (%)	Undecided n (%)	Disagree n (%)	Strongly disagree n (%)
Premarital sex is acceptable to me	27 (6.8)	69 (17.3)	75 (18.8)	72 (18.0)	157 (39.3)
Accessing the Internet for sexual material or movies is acceptable to me	27 (6.8)	74 (18.5)	52 (13.0)	84 (21.0)	163 (40.7)
The Internet has a bad influence on youths' sexual behavior	152 (38.0)	142 (35.5)	48 (12.0)	36 (9.0)	22 (5.5)
Frequent exposure to mass media is likely to promote sexual permissiveness among youth	120 (30.0)	56 (14.0)	44 (11.0)	31 (7.7)	149 (37.3)
Protected sex (use of condoms) could be encouraged among youth through mass media	163 (40.8)	143 (35.8)	49 (12.2)	29 (7.2)	16 (4.0)
It is the modern time now, and youths could be involved in premarital sex	97 (24.3)	180 (45.0)	36 (9.0)	41 (10.2)	46 (11.5)

**Abbreviation:** n, number.

This differs from what has been reported in other studies, which generally have found that most adolescents have access to the mass media and the Internet.<sup>1-3,10,23</sup> This may not be surprising, however, as these previous studies were carried

out in developed countries where information technology is not only more advanced, but also more readily affordable and accessible than it is in developing countries like Nigeria.

Regarding sexually explicit materials, most of the respondents opined that the Internet (~40%) and radio and television (~25%) were sources of sexually explicit materials. This has been similarly reported in other studies.<sup>10,20</sup>

**Table 5** Sexual behaviors of respondents (n=400)

Variables	n (%)
Awareness of forms of sex behavior (multiple responses allowed)	
Masturbation	357 (89.2)
Oral sex	352 (88.0)
Anal sex	339 (84.7)
Coitus	400 (100.0)
Sexually experienced	
Yes	226 (56.5)
No	174 (43.5)
Most recent sexual exposure (n=226)	
Last 1 week	103 (45.6)
Last 3 months	46 (20.4)
Last 6 months	32 (14.1)
Others	45 (19.9)
Practice of forms of sexual behavior (n=226) (multiple responses allowed)	
Masturbation	31 (13.7)
Oral sex	37 (16.4)
Anal sex	10 (4.4)
Coitus	226 (100.0)
Frequency of condom use (n=226)	
Always	122 (54.0)
Occasionally	14 (6.0)
Never	90 (40.0)
Sex with commercial sex workers (n=226)	
Yes	33 (14.6)
No	193 (85.4)
Age at first intercourse (years) (n=226)	
Less than 15	11 (4.9)
15-19	117 (51.8)
20-24	65 (28.7)
25-30	33 (14.6)
Current number of sexual partners (n=226)	
None	45 (19.9)
1-2	171 (75.7)
3-5	10 (4.4)

**Abbreviation:** n, number.

**Table 6** Association between sexual activity and other characteristics of respondents (n=400)

Variable	Sexually active		$\chi^2$	P-value
	No (%)	Yes (%)		
Age groups (years)				
Less than 20	14 (82.4)	3 (17.6)	15.4	0.001
20-24	101 (42.4)	137 (57.6)		
25-29	57 (43.5)	74 (56.5)		
30 and above	2 (14.3)	12 (85.7)		
Sex				
Female	113 (49.8)	114 (50.2)	8.4	0.004
Male	61 (35.3)	112 (64.7)		
Marital status				
Single	168 (45.2)	204 (54.8)	6.0	0.01
Married	6 (21.4)	22 (78.6)		
Time spent watching television daily (hours) (n=341; no response =59)				
0-2	49 (40.5)	73 (59.5)	6.7	0.03
3-5	57 (42.5)	77 (57.5)		
More than 5	22 (25.9)	63 (74.1)		
Frequency of Internet use*				
Often	66 (33.7)	132 (66.3)	16.6	0.0003
Occasionally	63 (53.8)	53 (46.2)		
Rarely	45 (46.3)	41 (53.7)		
Frequency of accessing sexually explicit materials (n=298)*				
Often	12 (21.4)	44 (78.6)	14.8	0.001
Occasionally	16 (30.2)	37 (69.8)		
Rarely	90 (47.6)	99 (52.4)		
Place of residence				
Rural	25 (54.3)	21 (45.7)	2.5	0.11
Urban	149 (42.1)	205 (57.9)		

**Note:** \*Often indicates daily to weekly use; occasionally indicates once or twice a month; and rarely indicates once in two to three months.

**Abbreviation:** n, number.

**Table 7** Binary logistic regression of sexual activity against its possible predictors (n=400)

Variables	Categories of variable	P-value	Odds ratio	95% confidence intervals	
				Lower	Upper
Sex	Male (reference)	0.129	0.620	0.335	1.149
Ethnicity	Hausa (reference)	0.020			
	Yoruba	0.978	0.969	0.106	8.852
	Ibo	0.287	3.613	0.339	38.521
Number of television viewing hours	Above the mean (reference)	0.445	0.774	0.400	1.496
Age	≥25 years (reference)	0.142	0.575	0.275	1.204
Level in school*	Upper level (reference)	0.097	1.825	0.898	3.709
Frequency of Internet use <sup>†</sup>	Rarely (reference)	0.115			
	Often	0.094	2.095	0.883	4.974
	Occasionally	0.757	1.158	0.456	2.942
Accessing the Internet for sexual material/movies is acceptable to me	Agree (reference)	<0.001			
	Disagree	<0.001 <sup>‡</sup>	0.043	0.016	0.122
	Undecided	0.050	0.279	0.078	0.998
Marital status	Ever married (reference)	0.021 <sup>‡</sup>	0.075	0.008	0.679

**Notes:** \*Lower level includes first-year to third-year students; upper level includes fourth-year and fifth-year students; <sup>†</sup>often indicates daily to weekly use; occasionally indicates once or twice a month; and rarely indicates once in two to three months; <sup>‡</sup>statistically significant.

**Abbreviation:** n, number.

Several studies have shown clearly that sexual content is prevalent on television.<sup>24–26</sup> The Internet has also been said to make sexually explicit materials more accessible to youth than ever before.<sup>10,27</sup> Approximately 17% of respondents also considered home videos to be a source of sexually explicit materials, and a little more than that felt that these also affect sexual behavior. This has been corroborated by other studies,<sup>28–30</sup> and it has been reported that sexual content is more explicit in movies than on television.<sup>10</sup>

Interestingly, despite the fact that most of the respondents considered the Internet to be a source of sexually explicit materials and to have effect on their sexual behaviors, most

of them also considered the Internet to be their favorite source of information and entertainment. It is therefore surprising that only a few studies (and even fewer studies in developing countries) have examined the sexual content of the Internet in relation to the sexual behavior of the young people. There is a great deal of existing literature on the influence of mass media on the behaviors of adolescents and young adults, particularly in the United States and other Western cultures; thus, the strength of this study is that it is assessing a country where not as much research has been done on the relationship between mass media and sexual behavior.

**Table 8** Binary logistic regression of multiple sexual partners against its possible predictors (n=400)

Variables	Categories of variable	P-value	Odds ratio	95% confidence intervals	
				Lower	Upper
Sex	Male (reference)	0.022*	0.308	0.113	0.843
Ethnicity	Hausa (reference)	0.021			
	Yoruba	0.161	0.144	0.010	2.167
	Ibo	0.014*	0.022	0.001	0.465
Number of television viewing hours	Above the mean (reference)	0.786	0.875	0.332	2.300
Age	≥25 years (reference)	0.124	0.388	0.116	1.296
Level in school <sup>†</sup>	Upper level (reference)	0.848	0.889	0.266	2.967
Frequency of Internet use <sup>‡</sup>	Rarely (reference)	0.101			
	Often	0.045*	5.450	1.035	28.703
	Occasionally	0.041*	7.295	1.085	49.040
Accessing the Internet for sexual material/movies is acceptable to me	Agree (reference)	0.262			
	Disagree	0.122	0.376	0.109	1.300
	Undecided	0.955	0.966	0.288	3.243
Marital status	Ever married (reference)	0.999	0.000	0.000	0.001

**Notes:** \*Statistically significant; <sup>†</sup>lower level includes first-year to third-year students; upper level includes fourth-year and fifth-year students; <sup>‡</sup>often indicates daily to weekly use; occasionally indicates once or twice a month; and rarely indicates once in two to three months.

**Abbreviation:** n, number.

Two thirds of the respondents learned about the Internet from friends and less than 4% from parents. This pattern is likely to result in varied and unbalanced information, often with poor quality. Respondents' main reasons for using the Internet were for school assignments and email; however, three quarters of the respondents also used the Internet to view sexually explicit movies and pornography. This is similar to what was reported in a study of 813 university students from across the United States, in which 87% of the males and 31% of the females reported seeking out pornography themselves.<sup>31</sup> This calls for concern, because the Internet and mass media may be the sources of first impressions and ongoing perceptions that are critical in the development of a young person's sexual attitudes, expectations, and behaviors. If young people's initial explorations of sex happen in the context of the online "sexual marketplace,"<sup>10</sup> it will be difficult for them to develop healthy concepts of sex and their own sexuality. Young adolescents are shaped by their experiences. Furthermore, sexually explicit content may present new ideas, which in turn may influence an adolescent's development of values and perception of healthy sexual relationships. The sexually explicit information found on the Internet is often inaccurate and harmful. It often lacks descriptions of intimacy or the development of deep personal relationships. Rather, it encourages sexual acts without any emotional connection, which in turn may begin to shape a person's sexual values, attitudes, and behaviors, and consequently may interfere with healthy sexual development.

In this regard, it is critical to view the Internet as a new social environment in which universal adolescent issues pertaining to identity formation, sexuality, and self-worth are explored in a virtual world. Easy and continuous access to the Internet provides tremendous opportunities for adolescent socialization, allowing them to connect with their peers as well as with complete strangers from across the world. Clearly, the Internet is transforming the social world of adolescents by influencing how they communicate, establish and maintain relationships, and find social support. Therefore, it is essential to gain awareness of both the potential benefits and risks of teen Internet use and to provide strategies to guide safe and positive practice.

Half of the respondents said they used the Internet often, and there was a significant association between frequency of Internet use and frequency of accessing sexually explicit materials on the Internet, with frequent users of the Internet more likely to frequently access sexually explicit materials. There was also a significant association between being sexually active and the frequency of Internet use and frequency

of accessing sexually explicit materials on the Internet, with those who used the Internet or accessed sexually explicit materials often being more likely to be sexually active. This is similar to the finding of Brown et al,<sup>32</sup> who in their longitudinal study found that the quintile of teens who consumed the greatest amount of sexual-media content in early adolescence were more than twice as likely as those with lighter sexual-media diets to have initiated sexual intercourse by the time they were 16 years old. This may be another reason for concern about increasing access to mass media/the Internet, especially with the advent of mobile phones, laptops, and other portable electronic devices with facilities for accessing the Internet and watching movies.

About 6 of 10 respondents had poor attitudes towards mass media/the Internet and their sexual behavior, and a quarter of them considered viewing sexually explicit materials or sex movies on the Internet to be acceptable. This is similar to what was reported in a study carried out among undergraduates in the United States, wherein two thirds of the males and half of the females considered viewing pornography to be acceptable.<sup>31</sup> Nearly 60% of the respondents in the current study were sexually active, with nearly half of these having had their most recent sexual exposure within a week before data collection. This pattern has been reported in earlier studies generally showing that young adults, especially those in developing countries, are becoming more sexually experienced.<sup>33,34</sup> It was, however, interesting to find a significant relationship between being sexually active and factors such as time spent watching television and frequency of Internet use. This relationship also has been reported in previous studies. Peterson et al<sup>35</sup> found an association between duration of television viewing and early initiation of sexual intercourse among adolescents. Brown and Newcomer<sup>11</sup> also found that junior-high-school students who watched television with more sexual content were more likely to have initiated sexual activity than were those who watched less sexual-media content.

More than 9 of 10 respondents in this study felt that mass media/the Internet had an effect on their sexual behavior, and about half of them believed the effect was both positive and negative. This is similar to the opinions shared by previous authors.<sup>1,3</sup> The Internet might have a positive effect on teenagers, as there are some sites that create awareness about teen pregnancy, human immunodeficiency virus, and sexually transmitted diseases. These sites could be used by young people when they have nowhere else to turn. However, research has shown that mass media/the Internet can also negatively influence young people's sexual behavior because teenagers are more likely to start having sexual relationships earlier

without using protection.<sup>1,3</sup> Multivariate analysis showed that acceptability of accessing the Internet for sexual materials was a predictor of the likelihood of being sexually active; the frequency of Internet use for accessing sexual materials/pornography was also found to be predictive of respondents' likelihood of having multiple sexual partners. These findings corroborate reports from other researchers on the negative influence that Internet use may have on adolescents' sexual behaviors.<sup>1,3,11,32,35</sup>

## Conclusion and recommendations

Most of the respondents in this study were aware of the various forms of mass media and the Internet, although only a few of them had ready access to these. Most of the respondents spent 3–5 hours a day watching television, and most also used the Internet often. There was a significant relationship between sexual activity, time spent watching television, and the frequency of Internet use: those who spent more time watching television and those who used the Internet more frequently were more likely to be sexually active. Frequency of Internet use for accessing sexual materials was found to be a predictor of being sexually active and of the likelihood of having multiple sexual partners.

On the basis of these findings, the authors recommend that young people be educated on the proper use of mass media/the Internet. The directors and producers of programs broadcasted on mass media/the Internet should be educated on the need to balance portrayals of sexual activity with the possible consequences of choices in sexual behavior. Parents are also encouraged to be involved in their children's patterns and choices of mass media and Internet use. Families should regularly discuss with their children the limitations of the information in the mass media and its potential misuse in relation to reproductive health and rights. As a matter of support, parents should adhere to the available rule of "parental guidance" when watching certain movies and programs in the mass media, most especially on television and the Internet. Because Nigerian undergraduates are required to take a general course on information and communication technology as a way of acquiring basic knowledge in this arena, colleges and institutions should use this opportunity to educate students on the use and misuse of the mass media and proper use of the Internet as source of information on sexual issues.

## Disclosure

The authors report no conflicts of interest in this work.

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