DIGITAL HABITS AND USE OF THE INTERNET AS SOURCE OF SEXUAL AND REPRODUCTIVE HEALTH INFORMATION AMONG UNDERGRADUATES IN NORTHERN NIGERIA

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ABSTRACT

BACKGROUND: Surfing the internet and networking via social media have evolved at a startling pace.

OBJECTIVES: To determine internet and social media habits and identify predictors of their use as sexual and reproductive health resource among Bayero University students.

STUDY DESIGN: A cross section of 385 students was interviewed using pre-tested anonymous structured self-completed questionnaires.

RESULTS: Nearly all students 98.4% (n=377) had accessed the internet and most 96.3% (n=363) had visited social media sites. Face book 57.3% (n=208), Twitter 22.3% (n=81) and Blackberry Messenger 8.8% (n=32) were the most popular among students. Of those with internet access, 51.2%, 46.2%, 39.2% and 38.5% mainly searched for information on HIV/AIDS, STI, sexual activities and menstrual problems respectively. There was more than two-fold likelihood of accessing online sexual information among female students compared to males, adjusted Odds ratio (aOR=2.52); 95% Confidence Interval (95%CI= 2.41-4.86). Similarly, ever-married students had more than twice the chance relative to single students (aOR=2.2, 95%CI=1.17-4.28). Furthermore, younger students (<20 years) were twice more likely to have used online resources compared to their older colleagues (≥30 years) (aOR=2.12, 95%CI=1.32-4.17).

CONCLUSION: Undergraduate students are increasingly turning to the internet for sexual and reproductive health information. This presents an opportunity for programming.

KEY WORDS: Internet, Social media, Reproductive, Sexual health, information source

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INTRODUCTION

Compared to previous generations, the over 1.2 billion adolescents living mainly in low-and middle-income countries are more likely to attain early independence from parents and have increased digital access to information.[1] They are also more likely to postpone marriage and experiment with pre-marital sex.[2] Multiple sexual partners, low and inconsistent condom use has been reported to be common among them, thereby predisposing them to increased risk of sexually transmitted infections (STI) including HIV/AIDS.[3] There is also evidence that young people tend to avoid conventional health services or underutilize them due to the judgmental nature of the service providers, cost, stigma and lack of privacy.[4,5] With parental reluctance to take on the responsibility of providing accurate but sensitive sexual and reproductive health information, this void was mostly filled by their equally ignorant peers.[6] However, the advent of the internet and social media has dramatically changed the communication landscape, especially for these young adults. Being avid technology users, the digital revolution came as a unique opportunity to enhance health literacy among young adults. This is more so for sensitive subjects such as sexuality, STIs, HIV / AIDS, pregnancy and drug use among others.[7]

Social media has transformed the traditional unidirectional model of communication to a multidirectional, real-time, interactive access to a wide range of contents on mobile or fixed digital devices.8 It also provides for instant feedback, enhances creativity and community formation beyond borders.[9] They are in forms of blogs, discussion forums, text-messages, wikis, social networks and much more.[10] Facebook, initially a Harvard-only social network evolved into a worldwide network. Others networks that are popular among young adults include; YouTube, Vimeo, MySpace, Bebo, Flickr, Twitter and many others.[11] They

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constitute a huge and expanding repository of health information including those related to sexual and reproductive health.[12] Young people use them to explore romance, friendship and other aspects of youth culture.[13] While they present a platform for accessing information, they also pose serious challenges for parents, sexual health professionals and young people alike. Issues having to do with loss of control, content validity, sexual predators, cyber bullying and concerns about privacy have been consistently raised by different stakeholders.[14]

Nonetheless, studies in the global north indicate that these new media could be harnessed as an effective SRH information resource for the teeming technology savvy youths.[15] Very little is known about the digital habits of the large cohort of youths in developing countries including Nigeria. University students represent a highly educated, sexually active and technologically inclined group of young adults in these developing countries. Therefore, as prelude to a pilot project aimed at enhancing access to factual, accurate and culturally appropriate SRH-related information for undergraduates via a web-based platform, we assessed the baseline digital habits of Bayero University students and identified the predictors of internet use as a SRH resource. The findings could inform strategies for the main project.

Participants and methods

Setting

The study was conducted at the Faculty of Social and Management Sciences of Bayero University Kano, Nigeria. This faculty was selected because it houses the largest registered undergraduate students in the University as at the time of the study. Established in 1975, this University is located in the city of Kano, the commercial capital of northern Nigeria. The university has two campuses spanning 3,400 hectares, a total of eight faculties and two schools, and an undergraduate student population of 28,548 (20,379 males and 8,169 females). Most of the students came from Kano, Jigawa, Katsina, Kaduna, Bauchi, and Zamfara states. In addition, there are students from other parts of Nigeria and international students from Niger Republic, Sudan, India, Pakistan, and Bangladesh.[16]

Study Design and Participants

A cross-sectional descriptive study design was used. All registered undergraduate students in the Faculty of Social and Management Sciences were eligible for inclusion in the study. Postgraduate students were excluded. A sample size of 400 students was obtained using the hypothesis testing method[17] and based on the following; 95% confidence level, a 5% margin of error, and prevalence of internet use for sexual and reproductive health information (55.2%) from a previous study.[18] The sample size was increased by 10% to account for subject non-response. A stratified sampling technique with proportionate allocation based on population of students in each department of the faculty. This was followed by the self-completion of questionnaires by the students who consented. Respondents were instructed not to write their names on the questionnaire to ensure anonymity and confidentiality. Ethical clearance was obtained from the Aminu Kano Teaching Hospital ethics committee.

Study Instrument

A structured questionnaire with mostly close-ended questions was adapted from the tool used in an earlier study.[18] Modifications were made to ensure that the instrument was suitable for the present study objectives. The questionnaire was pretested and validated among 30 students of a department that was not selected for the study (Department of History). Necessary changes were then implemented to enhance clarity. The questionnaire collected information on socio-demographic characteristics of respondents, internet and social media access and use. It also specifically inquired about the use of internet and social media as sources of sexual and reproductive health information. Furthermore questions about online experiences of students were included.

Theory and Measurements

We adapted the Integrative Model of Behavior Change[19] as the underlying theory for this study. It builds on social cognitive theory and integrates it with other theories, such as the Theory of Reasoned Action[20] and the Uses and Gratifications (U&G) theory [21] to predict that media exposure will influence behavior through shifts in behavioral intentions, which are themselves a function of attitudes, norms, and perceptions of self-efficacy acquired through media and other sources.[21,22] We adapted the Variables from a previous study[18] and they include 1). Socio-demographic and educational level variables: age, sex, level of study. 2) Variables related to access and utilization of information and communication technologies (ICT): Ever use of the Internet, frequency of use, health related information search, SRH information search, health issue searched on the Internet, perception of health information obtained from the Internet. We classified internet and social media use as ever use and never use. For those that have used it, we inquired about the frequency of use and categorized this as; daily use, use on a number of days per week and other less frequent/ occasional use.[18]

Data Analysis

Data were analyzed using SPSS version 22.24

Quantitative variables were summarized using appropriate measures of location and variability. Categorical variables were presented as frequencies and percentages. Bivariate analysis involved the use of Pearson's chi-square test or Fisher's exact test as appropriate for assessing the significance of associations between internet and social media use and socio-demographic variables. At the multivariate level, logistic regression analysis was used to obtain Crude and adjusted Odds ratios with (95% confidence intervals) for predictors of use of internet and social media as sources of sexual and reproductive health information adjusting for confounders. The co-variates included variables that were significantly associated with internet and social media use at bivariate level. P<0.05 was considered as minimal type 1 error rate in the study.

Results

Socio-demographic characteristics

A total of 385 questionnaires out of 400 were completed and returned, yielding a response rate of 96.3%. Reason for non-response was mainly time-related. Table I shows that less than half 44.9% (n=173) of the respondents were females and the overall mean (± standard deviation (SD) age was 24.0 (±3.52 years). Majority of students 56.6% (n=218) were of Hausa-Fulani ethnicity, Muslim 77.4% (n=298) and Single 83.6% (n=322). The respondents were from the departments of Accounting 14.3% (n=55), Business Administration 14.6% (n=56), Economics 14.6% (n=56), Geography 14.0% (n=54), Mass communication 14.3% (n=55), Political science 13.8% (n=53) and Sociology 14.6% (n=56).

Awareness and utilization of Internet and Social Media

Awareness of the internet was nearly universal 99.5% (n=383) and most students 98.4% (n=377) have ever used it. Of these, more than half 54.6% (n=206) used it daily, just above a quarter 27.9% (n=105) used it a few times a week and the rest 17.5% (n=66) were occasional users. Almost all students 97.4% (n=375) had internet enabled mobile phones. Internet was accessed mainly on mobile/blackberry phones and other hand held devices 61.0% (n=230), in cybercafés 19.1% (n=72), personal laptops 18.8% (n=71) and rarely on desktops 1.1% (n=4). Majority of the respondents who used the internet 96.3% (n=363) have visited a social networking site (SNS) at least once. Among all the SNS frequented, Facebook was the most popular 57.3% (n=208), followed by Twitter 22.3% (n=81), Blackberry Messenger 8.8% (n=32), 2go 8% (n=29) and others 3.6% (n=13). Most respondents 64.5% (n=234) used SNS mainly to make friends, search for general information 12.7% (n=46), have fun & entertainment 7.7% (n=28), chat with family and friends 7.1% (n=26), for current affairs 4.4% (n=16), business 1.4% (n=5), for academic purposes 1.1% (n=4) and others 1.1% (n=4).

Internet and Social Media as sources of sexual and reproductive health (SRH) information

About three-quarters 79.8% (n=301) of the respondents that have ever accessed the Internet, searched for sexual and reproductive health information at least once. A little above half 51.2% (n=154) of them obtained HIV/AIDS-related information. Less than half 46.2% (n=139) searched for information on STIs while over a third each (39.2% (n=148) and 38.5% (n=145) sought for information on sexual activities and menstrual disorders respectively. Others accessed information related to parenting 32.2% (n=97), pregnancy 31.6% (n=95), reproductive system and breast cancers 30.2% (n=91). More than a quarter each searched for information on sexual abuse 29.9% (n=90), labour 29.9% (n=90), breastfeeding 29.9% (n=90), contraception 27.9% (n=84) and abortion 26.2% (n=79). Furthermore, Human Papilloma Virus (HPV) vaccine 23.3% (n=70) and gay, lesbian and transsexual issues 23.2% (n=79) were the key words searched by others. Apart from sexual and reproductive health matters, other health-related issues searched for on the internet include fitness/exercise 60.5% (n=182), diet/nutrition 56.1% (n=169), obesity/slimming 39.2% (n=118) and drug abuse 39.5% (n=119).

Those that searched for information on HIV/AIDS were interested in facts and statistics about HIV/AIDS, Voluntary Counseling and Testing (availability, procedure and confidentiality), methods of prevention including condom use. Similarly, those that searched for information on other STIs were looking for symptoms and methods of prevention and treatment of various STIs including Gonorrhoea, Syphilis, Genital warts, HPV infection among others. Majority of respondents 67.4% (n=203) used the Google search engine and used links to other websites for detailed information. Other sites frequented by the rest 32.6% (n=98) of the respondents include menshealth.com, womenshealth.com, maama.com, ask.com, about.com, answers.com, askmen.com, healthcare.com and healthwatch.com, doctors.com, blackbeauty.com and purematrimony.com. Majority of the respondents (88.7%), were motivated by quest for knowledge, symptoms suggestive of STIs, convenience compared to a visit to a busy clinic, need for contraceptive information, ease of access, privacy, friends or academic assignments.

Students' online experiences and perception of Internet and Social media as sources of SRH information

Majority of the respondents (73.3%) felt that the internet and social media are good sources of sexual

and reproductive health information. Reasons given include; wide scope of information (26.5%), ease of access (21.0%), privacy (19.9%), low cost (18.5%) and real time availability (14.1%) anywhere you go. Those that perceived them as poor sources of SRH information stated that the information may be unreliable and misleading as it may not necessarily be written by experts (62.5%). Other reasons include limited internet access (25.0%), risk of sexual solicitation and sexual predation (12.5%).

Also, a substantial proportion 57.2% (n=172) of them also reported at least one form of online harassment. More than two-thirds of those harassed 67.4% (n=116) received e-mails in which sexual activity was discussed, 65.7% (n=113) received pictures suggestive of sexual activity, 64.0% (n=110) were connected to web links with sexual content and 55.2% (n=95) received unexpected sexual solicitation. Similarly, (n=93, 54.1%) came across icons suggestive of sexual activity, 58.1% (n=100) accessed sites with sexual content without intending to do so. Furthermore, 44.8% (n=77) have been sexually harassed via, text messaging or phone calls emanating from online contacts.

Predictors of online sexual and reproductive health information use

At bivariate level, females and married students were more likely to access reproductive information online and these associations were significant ($P<0.05$). In contrast, there was an inverse relationship between age and online access of reproductive information (χtrend =6.6, P=0.01). There was also a non-significant increasing trend with the level of study (χtrend =0.18, P=0.67). No differences were observed by religion, ethnicity or state of origin ($P>0.05$) (Table II).

After adjusting for other factors using a multivariate logistic regression analysis, respondent's gender, age and marital status remained significant predictors of online access and utilization of reproductive health information. Specifically, there was more than two-fold likelihood of accessing online reproductive health information among female students compared to males, adjusted Odds ratio (aOR=2.52); 95% Confidence Interval (95%CI= 2.41-4.86). Similarly, the likelihood of sourcing sexual and reproductive health information from the internet among ever-married students was more than double those of their single counterparts (aOR=2.2, 95%CI=1.17-4.28) (Table III). Furthermore, younger students (<20 years) were twice more likely to have used online sexual and reproductive health resources compared to their older colleagues ($\geq$30 years) (aOR=2.12, 95%CI=1.32-4.17).

DISCUSSION

The proportion of students who had accessed the internet in this study compares with the proportions reported from Olabisi Onabanjo University (97.6%) and Federal University of Technology Owerri (93%) in southern, Nigeria.[25,26] However, relatively lower figures were reported from Ghana (66%) and Uganda (50%).[27,28] Our figure was similar to those reported among young adults in China (90%)[29] and US teenagers (93%).[30] Like their American counterparts[31] real-time internet access was facilitated mostly via mobile devices. The differences is most likely due to the timing of the studies as there are rapid changes in the adoption of technology, especially among young adults even in resource-limited settings.

Compared to other Nigerian students, our respondents were more avid users of the internet and social media,[32,33] but they were at par with United Arab Emirate students and young Australians.[34,35] Reported daily use were (86%) and 90% in the respective countries.[34,35] Furthermore, the proportion of our respondents visiting SNS was higher than that reported in earlier studies among undergraduates in south west Nigeria (40.5%),[36] young adults in Australia (>33%) and US teenagers (71%).[35,37] Again these figures are likely to be much higher now going by the increasing popularity of social media and global trends in internet access.

Unlike their adult counterparts, our respondents used the internet mainly for social entertainment and studies. Just like their colleagues elsewhere they used it to exchange messages in discussion forums and to create and remix media. Others used it to share videos and photographs using instagram.[38,39] Wireless internet access is increasingly available on University campuses worldwide. This could partly explain the increasing use of the internet and social media as seen in this study. However, the study population, design and level of infrastructural development are varied and could account for some of these differences.

With the increasing access and utilization of the internet and social media, it is therefore not surprising that a high proportion of our respondents obtained health information from the internet. This is at the higher end of the range reported among adolescents in previous studies.[15,41] Specifically, the proportion of students accessing sexual and reproductive health information online (78.6%) in the present study was much higher than the figures reported from Ekiti, south-west Nigeria (32.9%)[42] and Ghana (34.3%).[27] A relatively lower figure was also reported from the US (41%).[31] In the latter study, teenagers specifically

reported that they searched for information on health topics that are hard to talk about including sex and drugs. Here also, variations in study population, design and timing of the study could explain some of these differences. The health topics searched on by our respondents was also similar to what was reported among these groups previously.[27]

Though enthusiastic about Internet and social media as sources of health information including sexual and reproductive health information, our respondents also expressed concerns about the safety of the online environment. In other studies even parents have expressed their worry on the use of this portal as a source of SRH information among youths. For instance, in the Senegalese study earlier alluded to, tension arose as the use of innovative and interactive technologies by youths collided with conservative values of some parents.[43] An appropriate mix of multiple media platforms including both the new and traditional media strategies was suggested as a means for improving health literacy among these young people while minimizing the risks of the online environment.[43] Furthermore, although Australian youths were interested in sexual health information, they did not want to access it at the cost of their own sense of comfort. They identified participation, stigma, careful presentations of self; privacy concerns and humor as important to them in sexual health messaging. Fears of bullying and gossip were other key considerations.[35] This is equally important in our setting as untoward experiences were reported by some of our respondents.

Personal factors such as gender, religion, academic level and socio-economic status have been reported to predict access and internet content used by Nigerian undergraduates in the south west.[36] It is therefore, not surprising that being female and married predicted the use of internet and social media as sources of SRH information among our respondents. These categories of students are likely to be more concerned about contraception, pregnancy and childbirth and since information regarding these are readily available online real-time they are likely to avail themselves of this opportunity. Also, the inverse relationship between age and internet use for SRH is not surprising. Although one expects younger students to be more avid users of the internet, the older ones are probably more likely to be sexually matured and concerned about issues related to contraception, pregnancy and STIs / HIV / AIDS. Other workers have reported the adventurous and technology savvy nature of the younger generations who also have better learning capability for new media and technologies. Although, this did not translate into the adoption of this portal as a source of sexual and health information.[36]

Our respondents are a selected group of well-educated undergraduates in one university in northern Nigeria. They are by no means typical of all university students or young people in the region. Therefore inferences from the study need to be taken within these limits. Secondly, we minimized the effect of social desirability bias by using anonymous, self completed questionnaires with little opportunity for discussion between respondents. Thirdly, rapidly evolving technology and increased availability of the Internet even in resource-limited settings means study findings related to access and utilization could soon be obsolete. However, the findings of this study could be used to inform the pilot ICT based SRH intervention platform, which if found to be effective could be scaled up taking cognizance of the culture, opportunities and challenges in our environment.

Our findings indicate that even students in resource-limited settings have become increasingly reliant on the internet as source of SRH information compared to previous generations whose favorite source was family members.[37]

This was especially so among the married female students. This is likely to impact positively on their SRH and in the future development of their community and country.

Young adults, especially females who are prone to dropping out of school in a setting like ours would be more empowered if they have access to information and services that would provide them with the wherewithal to avoid risky behavior, remain responsible and continue their education for longer without unintended interruptions, find better paying jobs and develop skills necessary to make responsible decisions and maintain positive SRH throughout their life. Utilizing this opportunity would require securing such web-based platforms to fence-off global sex predators, control cyber bullying and unsolicited explicit mails. In order to improve access to SRH among young people in resource poor countries, it is important to provide standardized information; customize and tailor information to local cultures and values; provide for interactivity; privacy; autonomy; portability; and cost-effectiveness as already suggested by earlier workers.[38] Apart from considering the local context, the application of these new media should be integrated with pre-existing effective cultural channels of impacting SRH and other life enhancing skills to our young ones. Youths also need to know that it is not all that is found online that can be trusted.[39] Others have suggested that elements crucial for developing such interventions include establishing a multidisciplinary team, allowing adequate time for obtaining approvals,

securing sufficient resources for building and maintaining an online presence, and developing an integrated process and impact evaluation framework.[40] Specifically, the contents should be age accurate and gender appropriate, it should start early and focus on abstinence, culturally relevant and appropriate. Furthermore, it should facilitate dialogue with trusted adults and counselors and provide for referral to health care providers in the University health services.[38]

Table I: Socio-demographic characteristics

Characteristics	Frequency No. (%)
Sex	
Male	212 (55.1)
Female	173 (44.9)
Total	385 (100.0)
Age group	
<20	59 (15.3)
20-29	86 (22.3)
≥30	240 (62.4)
Total	385 (100.0)
Level	
100	68(17.7)
200	108(28.1)
300	57(14.8)
400	152(39.5)
Total	385(100.0)
Religion	
Islam	298(77.4)
Christianity	87(22.6)
Total	385(100.0)
Ethnicity	
Hausa/Fulani	218(56.6)
Yoruba	45(11.7)
Igbo	26(6.8)
Others	96(24.9)
Total	385(100.0)
Marital status	
Single	322(88.7)
Ever married	63(17.4)
Total	385(100.0)

Table II: Factors associated with online use of sexual and reproductive health information among university students, Nigeria, 2012.

Characteristics	Uses online sources of sexual and reproductive information: Yes	No	Total	χ^2	*P*-value
Age group					
<20	53(89.8)	6(10.2)	59(15.3)		
20-29	69(80.2)	17(19.8)	86(22.3)		
≥30	179(74.6)	61(25.4)	240(62.3)		
Total	301(78.2)	84(21.8)	385(100.0)	6.6	0.01+
Sex					
Male	145(68.4)	67(31.6)	212(55.1)		
Female	156(90.2)	17(9.8)	173(44.9)		
Total	301(78.2)	84(21.8)	385(100.0)	26.4	<0.001
Marital status					
Single	244(75.8)	78(24.2)	322(83.6)		
Ever married	57(90.5)	6(9.5)	63(16.4)		
Total	301(78.2)	84(21.8)	385(100.0)	5.8	0.016
Level					
100	53(77.9)	15(22.1)	68(17.7)		
200	84(77.8)	24(22.2)	108(28.1)		
300	42(73.7)	15(26.3)	57(14.8)		
400	122(80.3)	30(19.7)	152(39.5)		
Total	301(78.2)	84(21.8)	385(100.0)	0.18	0.67+
Religion					
Islam	239(80.2)	59(19.8)	298(77.4)		
Christianity	62(71.3)	25(28.7)	87(22.6)		
Total	301(78.2)	84(21.8)	385(100.0)	3.2	0.08
Ethnicity					
Hausa/Fulani	170(78.0)	48(22.0)	218(56.6)		
Yoruba	31(68.9)	14(31.1)	45(11.7)		
Igbo	18(69.2)	8(30.8)	26(6.8)		
Others	82(85.4)	14(14.6)	96(24.9)		
Total	301(78.2)	84(21.8)	385(100.0)	6.5	0.09

+ χ trend Chi-sqaure test for trend

Table III: Predictors of online use of sexual and reproductive health information among university students, Nigeria, 2012.

Factors	Frequency No. (%) Uses Internet for SRH† information	Crude OR (95%CI)	*P* value	Adjusted OR(95%CI)	*P* value
Sex					
Male*	145(68.4)	1.0			
Female	156(90.2)	4.24(2.3-7.89)	<0.001	2.52(2.41-4.86)	0.012
Age group					
<20	53(89.8)	3.01(1.17-8.21)	0.019	2.12(1.32-4.17)	0.031
20-29	69(80.2)	1.38(0.73-2.65)	0.29	1.03(0.81-1.97)	0.16
≥30*	179(74.6)	1.0			
		1.0			
Marital status		3.04(1.2-8.15)	0.016	2.2(1.17-4.28)	
Single*	244(75.8)				
Ever Married	57(90.5)				0.03

*Referent category. Crude OR = odds ratio at bivariate level.
Adjusted OR = en-bloc adjustment for sex, age group and marital status.
† Sexual and reproductive health

REFERENCES

1. United Nations Department of Economic and Social Affairs, Population Division (2011). World Population Prospects: The 2010 Revision http://esa.un.org/unpd/wpp/index.htm. Last accessed 12th July 2014
2. Cohen AS. Delayed marriage and abstinence until marriage: On a collision course? The Guttmacher Report on Public Policy 2004;7(2):3-5.
3. Widman L, Noar SM, Choukas-Bradley S, Francis DB. Adolescent sexual health communication and condom use: a meta-analysis. Health Psychol. 2014;33(10):1113-1124.
4. Janssen M, Davis J. The youth worker's role in young people's sexual health- a practice framework. Youth Studies Australia 2009; 28(4):19-28.
5. Ralph L, Berglas N, Schwartz S, Brindis C. Finding teens in their space: Using social networking sites to connect youth to sexual health services. Sexuality Research and Social Policy 2011; 8(1): 38–49.
6. Iliyasu Z, Aliyu MH, Abubakar IS, Galadanci HS. Sexual and reproductive health communication between mothers and their adolescent daughters in northern Nigeria. Health Care Women Int. 2012;33(2):138-52.
7. Guse K, Levine D, Martins S, Lira A, Gaarde J, Westmorland W, Gilliam M. Interventions using new digital media to improve adolescent sexual health: a systematic review. J Adolesc Health. 2012;51(6):535-43.
8. Lefebvre C. Integrating cell phones and mobile technologies into public health practice: A social marketing perspective. Health Communication Practice 2009;10(4):490–494.
9. Thackeray R, Neiger BL. A multidirectional communication model: Implications for social marketing practice. Health Promotion Practice 2009;10(2):171-5.
10. Boyd D, Ellison NB. Social Network Sites: Definition, History and Scholarship. Journal of Computer-Mediated Communication 2008;13:210-213.
11. Junco R. The relationship between frequency of Facebook use, participation in Facebook activities and student engagement. Computers & Education 2011;58:162–171.
12. Evers CW, Albury K, Byron P, Crawford K. Young People, Social Media, Social Network Sites and Sexual Health Communication in Australia: "This is Funny, You Should Watch It". International Journal of Communication 2013;7:263–280.
13. Guse K, Levine D, Martins S, Lira A, Gaarde J, Westmorland W, Gilliam M. Interventions Using New Digital Media to Improve Adolescent Sexual Health: A Systematic Review. Journal of Adolescent Health 2012;51(6): 535-543.
14. Levine D, McCright J, Dobkin L, Woodruff A, Klausner J. SEXINFO: A Sexual Health Text Messaging Service for San Francisco Youth. American Journal of Public Health 2008;98(3); 393-395.
15. Nwagwu WE. The Internet as a source of reproductive health information among adolescent girls in an urban city in Nigeria. BMC Public Health 2007;7:354.
16. http://www.buk.edu.ng Accessed 17th August 2014
17. Lwanga S, Lemeshow S. Sample size determination in health studies: a practical manual, Geneva, World Health Organization 1991:23-41.
18. Jiménez-Pernett J, Olry de Labry-Lima A, Bermúdez-Tamayo C, García-Gutiérrez JF, Salcedo-Sánchez MC. Use of the internet as a source of health information by Spanish adolescents. BMC Medical Informatics and Decision Making 2010;10:6-12.
19. Larose R, Mastro D, Eastin MS. Understanding Internet Usage: A Social-Cognitive Approach to Uses and Gratifications. Social Science Computer Review 2001;19(4):395-413.
20. Sheppard, BH, Hartwick J, Warshaw PR. The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research. Journal of Consumer Research 1988;15, 325–343.
21. Grellhesl M, Narissra M, Punyanunt-Carter NM. Using the uses and gratifications theory to understand gratifications sought through text messaging practices of male and female undergraduate students. Computers in Human Behavior 2012;28 (6): 2175–2181.
22. Raacke J, Bonds-Raacke J. MySpace and Facebook: Applying the uses and gratifications theory to exploring friend-networking sites. CyberPsychology & Behavior 2008; 11(2): 169-174. doi:10.1089/cpb.2007.0056.
23. Kalmus V, Realo A and Siibak A. Motives for internet use and their relationships with personality traits and socio-demographic factors. TRAMES 2011;15(65/60):385–403.
24. IBM Corp. Released 2013. IBM SPSS Statistics for Windows, version 22.0: Armonk, NY: IBM Corp.
25. Bankole OM, Oludayo BS. Internet Use Among Undergraduate Students of Olabisi Onabanjo

University, Ago Iwoye, Nigeria. Library Philosophy and Practice 2012;2:8-12.
26. Anunobi CV. Dynamics of internet usage: A case of students of the Federal University of Technology Owerri (FUTO) Nigeria. Educational Research and Reviews 2006;1(6): 192-195.
27. Borzekowski DLG, Fobil, JN, Asante KO . Online access by adolescents in Accra: Ghanaian teens' use of the Internet for health information. Developmental psychology 2006;42(3):450-458.
28. Ybarra M, Kiwanuka J, Emenyonu N, Bangsberg DR. Internet use among Ugandan adolescents: implications for HIV intervention. PloS Med. 2006;3:e433.
29. Wallis C. New media practices in China: Youth patterns, processes and politics. International Journal of Communication 2011; 5:406–436.
30. Levine D. Using Technology, new media and mobile for sexual and reproductive health. Sex Res Soc Policy. 2011; 8:18–26.
31. Rideout VJ, Foehr UG, Roberts DF. Generation M2: Media in the Lives of 8- to 18-Year-Olds. Menlo Park, CA: Kaiser Family Foundation; 2010:34-39.
32. Ani OE. Internet access and use: A study of undergraduate students in three Nigerian universities. The Electronic Library 2010;28(4):555-567.
33. Nweze CMT. The use of ICT in Nigerian universities: A case study of Obafemi Awolowo University Ile-Ife. Library philosophy and practice 2010:494-497.
34. Ningshen K and Shakir M. Internet usage among young Arab students: preliminary findings. European and Mediterranean Conference on Information Systems 2009 (EMCIS2009) July 13-14 2009, Crowne Plaza Hotel, Izmir
35. Australian Communications and Media Authority. Click and connect: Young Australians' use of online social media. Quantitative Research Report 2009:23-26.
36. Alabi OF. Personal factors as predictors of content-specific use of the Internet by Ajayi Crowther University Students in Nigeria. New Media and Mass Communication 2013;16:79-87.
37. Lou C, Zhao Q, Gao E, Shah I H. Can the Internet Be Used Effectively to Provide Sex Education to Young People in China? Journal of Adolescent Health 2006;39(5):720-728.
38. Craig-Rushing S, Stephens D. Use of media technologies by Native American teens and young adults in the Pacific Northwest: Exploring their utility for designing culturally appropriate technology-based health interventions. The Journal of Primary Prevention 2011; 32(3): 135-145. doi: 10.1007/s10935-011-0242-z
39. Bremer J. The internet and children: advantages and disadvantages. Child Adolesc Psychiatr Clin N Am. 2005, 14(3):405-28.
40. Gold J, Pedrana AE, Sacks-Davis R, Hellard ME, Chang S, Howard S, Keogh L, Hocking JS, Stoove MA. A systematic examination of the use of online social networking sites for sexual health promotion. BMC Public Health. 2011; 11: 583. doi: 10.1186/1471-2458-11-58.3
41. Nwalo KIN, Anasi SNI. Access to and use of reproductive health information among in-school adolescent girls in Lagos State, Nigeria. Health Education Journal 2012;71(1): 90-101.
42. Ola TM, Oludare BA. Sexual Practices and Knowledge about HIV/AIDS among Nigerian Secondary School Students. International Journal of Health Research 2008; 1(4): 197-205.
43. Glik D, Massey P, Gipson J, Dieng T, Rideau A and Prelip M. Health-related media use among youth audiences in Senegal. Health Promotion International 2014 doi:10.1093/heapro/dau060