

## Computer-Mediated Communication as Predictor of Risky Sexual Behaviours among Adolescent Students: Implication for Childhood Sex Education and Counselling

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### Abstract

*This study examined the extent of the relationship between computer-mediated communication and risky sexual behaviours among adolescent students in Nigeria (N=415). Computer-Mediated Communication Eligibility Questionnaire, Adolescent Students' Use of Computer-Mediated Communication, and School Adolescent Students' Risky sexual Behaviours Questionnaire were used for data collection in the study. Mean, Standard deviation, Pearson correlation method and Regression statistics were used for data analysis. The results indicated that the extent adolescent students' engage in computer-mediated communication and risky sexual behaviour is high and there was a significant relationship between computer-mediated communication and risky sexual behaviours. The findings were discussed and educational, counselling and research implications were examined.*

**Keywords:** *Computer-mediated communication, risky sexual behaviours, correlate, adolescent students*

### 1. Introduction

For the past few decades, the integration of computers and communication technologies has revolutionized communication and made possible new and expanded forms of group work. In fact, for many people, electronic messaging, computer conferencing and electronic interactions are becoming more commonplace than using postal services. Thus, people (including in-school adolescents) have dived into the use of computerized devices to facilitate interpersonal interactions and this is known as computer-mediated communication. According to McQuail (2005), computer-mediated communication refers to those interpersonal interactions that occur through the use of networked computer applications. Bishop (2009) observed that computer-mediated communication has to do with communications via messaging applications, social networking platforms (e.g., Facebook, 2go, WhatsApp, BBM, Badoo, Skype, Twitter, Instagram, Pinterest, Myspace, Skyrock, Usenet, YouTube, Foursquare), e-mails, blogs, video, audio, phone, and online calls. Bishop (2009) further noted that this communication system has become integral to the initiation, development and maintenance of interpersonal relationships; and that the communication system is

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involved in the subtle shaping of communication in almost every relational context. Individuals exploit the features of these media to make their best impression and attract attention, thereby making face-to-face meetings less attractive even in business field. However, the nature of computer-mediated communication makes it easier for individuals to engage in communication with others regardless of time or location (Dunn, 2013) and in-school adolescents tend to dive into the use of such communication system.

In Campbell and Park's (2014) observation, computer-mediated communication has become a primary resource for in-school adolescents to expand and test boundaries. Thus, Computer-mediated communication plays an integral role in the emancipation process by providing young people with the autonomy and flexibility to connect with their peers and carry out their social lives. Considering the spontaneity and immediate access afforded by the phone, laptop or any other computerized device for communication, in-school adolescents can get to each other through linking of profiles in social networking platforms, posting of text, photo and video content, instant messaging and email. Therefore, it is not surprising that risky sexual behaviours have emerged as social practices.

Risky sexual behaviour is referred to as behaviour that increases one's risk of contracting sexually transmitted infections or experiencing unintended pregnancies. Such behaviours include having sex at an early age, especially before 18 years of age, having multiple sexual partners, having sex while under the influence of alcohol or drugs, unprotected sexual intercourse including unprotected genital, oral or anal sex with infected person, having sex with somebody who has a multiple sex partners, having sex with a partner who injects or has ever injected drugs, exchange of sex (sex work) for drugs or money, unwanted kissing, unwanted caressing, rape and sexual abuse, among others (Centers for Disease Control and Prevention, 2010; WHO, 2002).

Sexual behaviour during adolescence is peculiar because this is the period in which individuals start experiencing marked changes in their sexual makeup following puberty. Nwankwo (2014) argued that as they become conscious of their sexes, adolescent boys and girls get attracted to each other. At this time they begin to develop strong relational feelings thereby becoming more susceptible to unhealthy or risky sexual behaviours including: maintaining sexual relationships with multiple partners, sexting, sexual harassment through phone calls or chats, verbal threats, exposure to sexual media contents, sharing or exchange of pictures and profiles online, sending of romantic text messages, hang-out, romantic chats and romantic phone calls (Valkenburg & Peter, 2008). The present researchers consider these behaviours as risky sexual behaviours that may manifest through the use of computer-mediated devices and may transcend into the major risky sexual behaviours mentioned earlier, according to Centers for Disease Control and Prevention (2010) and WHO (2002).

Adolescents look to social networks as a key source of information and advice in a critical developmental period thereby becoming vulnerable to risky sexual behaviours. In a study by Lenhart et al (2010), 31% of adolescents also use online searches to gain answers to many of their health concerns, 31% of online adolescents get health, dieting, or physical fitness information from the internet while 70% of adolescents who use the internet report they use it to gather information about health topics that are hard to discuss with others, such as drug use and sexual health. Cross and Morgan (2003) had earlier blamed the media for the changing sexual attitudes and behaviours of students. Students currently receive more sex education through Life Orientation, peer education and through media, for example, TV programmes. Consequently, Berkman (2010) observed that while social media use is an integral part of the daily life of adolescents, there are a number of risks associated with social media use including, negative effects on mental health, cyberbullying, texting or sexting, dangers of sexual solicitation, and exposure to problematic and illegal content and privacy violations that may lead to risky sexual behaviours. Valkenburg and Peter (2008) found that adolescents' frequent exposure to

sexually explicit internet material is associated with greater sexual uncertainty. Liau, Khoo and Hwaang (2005) found that online romantic contact among adolescents results in face-to-face meeting. It should be noted that, the emergence of computer technology has created strong effect on human sexual affairs. Such technology cut across every sphere of life making it difficult to have control over certain issues all over the world. The situation is not quite different from what is obtainable in different parts of Nigeria today.

In recent time, there is drastic increase in the number of adolescent students that are using computerized devices such as; phones, i-pads and laptops to facilitate their interpersonal interactions. The adolescent students have opportunity to establish and maintain relationships with opposite sex through phone calls and chats using facebook, whatsapp, 2go and twitter among others, and often use the medium to discuss sexual matters or romance, exchange pictures, and negotiate for face-to-face contact. Thus, there is observable and regrettable evidence of high rate of adolescent students hang-out around plazas, fly-overs, and stadiums and other recreational centers and hotspots in Nigeria and this predisposes the adolescent students to risky sexual behaviours.

Literature shows that adolescence is a period of rapid growth and dramatic body changes coupled with development of sexual organs and this make the adolescents to develop persistent desire and passion for opposite sex friendship. As a result, the in-school adolescents are prone to major risky sexual behaviours such as inconsistent condom use, sex with multiple partners, masturbation, sexual intercourse with stranger, anal or oral sex, caressing of opposite sex mate, rape, sexting, sexual harassment, unwanted touch, unwanted kiss, attempted rape, 'half-naked' dresses, among others.

Consequently, there is lamenting increase in the number of adolescent students who experience unwanted pregnancy, unsafe abortion and sexually transmitted diseases (STDs). Also, many adolescents have dropped out of school, many have signed in for early and immature marriages, many have experienced stillbirths, many have experienced death in the course of unsafe abortion or STIs and many have experienced birth complications including Vesico Vaginal Fistular (VVF). This situation is worrisome not only to the present researcher but also to parents, teachers, counsellors, educators, and even government. If this unsatisfactory state of affairs is left unaddressed the in-school adolescents will continue to be victims of unwanted pregnancy, unsafe abortion, sexually transmitted infections (STIs), early marriage, forced marriage and many of them will drop out of school. But then, it is unclear how communication via computerized devices could relate with risky sexual behaviours. Therefore, the objective of this study is to investigate the relationship between computer-mediated communication and risky sexual behaviours among adolescent students in Nigeria.

## **2. Method**

### **2.1 Design of the Study**

The study utilized correlational research design. Nworgu (2006) states that the correlational research design seeks to establish what relationship exists between two or more variables. It is the kind of design that shows how two or more variables in a study relate. Thus, based on the purpose of this study, the researcher used correlational design to find out the extent of relationship between the predictive (computer-mediated communication) and the criterion (risky sexual behaviour) variable in the study.

### **2.2 Area of the Study**

The study was carried out in Uyo Education zone of Akwa Ibom State, Nigeria. This education zone comprises only Uyo Local Government Area, which is the Capital of Akwa Ibom State. Uyo is a fast-growing city, as the city has witnessed massive

infrastructural growth in the past nine years. The city boasts of recreational areas such as the Ibom Connection and the prestigious Le Meridian Ibom Hotel & Golf Resort.

Secondary schools in Uyo Education Zone have embraced computer curriculum and provide basic computer knowledge to the students. The students have access to mobile phones, laptops, i-pads, desktop computers, recharge cards, network and internet services that prompt them to make calls, text, email, chat and game using social network platforms such as facebook, myspace, skype and instagram among others. Coupled with numerous recreational centers, the social world of adolescents in this area has expanded enabling them to form relationships with one another and to satisfy their belongingness needs.

### **2.3 Population of the Study**

The population of this study comprised all senior secondary school two (SSII) students in public secondary schools in Uyo Education Zone of Akwa Ibom state. According to the data collected from Akwa Ibom State Secondary Education Board, Uyo (2015), the total number of SSII students is 5863 as at 2015/2016 school session. SSII students were considered appropriate for this study because they were more mature to understand the research instruments than SSI students and were not getting ready for certificate examination like SSIII. Also, the researcher assumes that SSII students have knowledge about computer-mediated communication and risky sexual behaviour to be able to respond adequately and appropriately to questionnaire items.

### **2.4 Sample and Sampling Techniques**

The sample of the study comprised all the 415 SSII in-school adolescents who used computer-mediated communication in all the 14 public secondary schools in Uyo Education Zone of Akwa Ibom State. A pre-survey was conducted by the researcher to identify these in-school adolescents. The sample was selected using a multi-stage procedure. First, the 14 secondary schools in Uyo Education Zone were divided into two - urban and rural schools using systematic sampling technique. This was to enable easy identification and access to schools in both the urban and the rural areas for the pre-survey.

In the second stage, proportionate stratified random sampling technique was used to select 1/3 of the SSII population in each school which gave a total of 1954 in-school adolescents for the pre-survey in the 14 public secondary schools in Uyo Education Zone. This technique was considered because, according to Nworgu (2006:101), proportionate stratified random sampling ensures greater representativeness of the sample relative to the population and guarantees that the minority constituents of the characteristics are better approximations of the population characteristics.

In the third stage, purposive sampling technique was used to select a total of 415 students who met the inclusion criteria for the study. The inclusion criteria involved the in-school adolescents scoring 50% and above in the computer-mediated communication eligibility questionnaire. The researcher kept contact details (such as the name, school and class) of the in-school adolescents who met the inclusion criteria to enable easy access during the actual study.

### **2.5 Instrument for Data Collection**

For the pre-survey, Computer-Mediated Communication Eligibility Questionnaire - (CMCEQ) with "Yes" or "No" response format, was developed by the researchers and used to ascertain in-school adolescents that were eligible for the study. In the actual study, two instruments were used for data collection: In-School Adolescents' Computer-Mediated Communication Questionnaire (ISACMCQ), Adolescent students, Risky Sexual Behaviours Questionnaire (ASRSBQ).

*Adolescent Students' Use of Computer-Mediated Communication Questionnaire (ASUCMCQ)*: The ASUCMCQ is a researcher-developed questionnaire. The questionnaire has two sections –A and B. Section A sought for personal information such as gender and location. Section B has 19 items that focused on the extent of in-school adolescents' engagement in computer-mediated communication using a 4-point Scale of Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE).

*Adolescent Students' Risky Sexual Behaviours Questionnaire (ASRSBQ)*: The ASRSBQ is a researcher-developed questionnaire. This questionnaire has two sections –A and B. Section A sought for personal information such as gender and location. Section B has 16 items that focused on the extent of in-school adolescents' engagement in risky sexual behaviours using a 4-point Scale of Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE).

## **2.6 Validation of the Instrument**

The copies of the instruments were given to three experts for face validation. One expert each was selected from Department of Educational Foundations in the areas of Guidance and Counselling, and Childhood Development and another from the Department of Science Education in the area of Measurement and Evaluation, all from a reputable university in Nigeria. The validates were required to assess and scrutinize the instrument with regard to the response format, appropriateness of the items and language clarity, especially as they relate to the purpose of the study. Thereafter, the researcher effected all the modifications and suggestions given by the validates.

## **2.7 Reliability of the Instrument**

In order to establish the internal consistency (reliability coefficient) of the instrument, the validated instruments were trial tested with 50 eligible SSII in-school adolescents selected from four secondary schools (two in the urban area and two in the rural area) in Ikot Ekpene Education Zone of Akwa Ibom State, which lies parallel to the study area. Each adolescent students selected was given the two set of the instruments (ASUCMCQ, ASRSBQ) to complete and return back to the researcher on the spot. The scores of students were collated and analyzed using Cronbach Alpha method. ASUCMCQ yielded a reliability coefficient of 0.84 alpha, while ASRSBQ yielded a reliability coefficient of 0.78 alpha.

## **2.8 Method of Data Collection**

The researcher visited each school used for the study with two research assistants. After brief discussion with the school principals about the purposes and the significance of the study in order to gain approval, the researcher solicited for the assistance of the school counsellors (where available) and the form teachers to mobilize the adolescents students that met the inclusion criteria for the study whose contacts were kept by the researcher during the pre-survey. Having obtained the informed consent of those adolescents students, copies of the questionnaires were administered to them by the researcher and the research assistants. This process took up to five working days to reach completion as researcher and the research assistants visited each school at least two times to make sure all the students that met the inclusion criteria were contacted to take part in the study.

## 2.9 Method of Data Analysis

The data collected in the study were scored in item-by-item format and then grouped into different categories based on the research questions and hypotheses in the study using SPSS version 16. Item-by-item descriptive statistics of mean and standard deviation was performed to show the extent adolescents students engage in computer-mediated communication and risky sexual behaviours and the results were used to answer research questions 1 and 2 respectively.

Pearson Correlation Coefficient was employed to answer research question 3. The results of data analysis for the research questions 1 and 2 were interpreted using real limit of numbers as follows: very high extent (3.50-4.00), high extent (2.50-3.49), low extent (1.50-2.49), very Low Extent (0.50-1.49). To ascertain the extent of relationship between the variables relating to research questions 3, the following guideline was used: 0.00-0.19 (very low extent), 0.20-0.39 (low extent), 0.40-0.59 (moderate extent), 0.60-0.79 (high extent) and 0.80 and above (very high extent). The decision rule for testing the hypothesis was to reject the null hypothesis if the exact probability value (p-value) is less than the a priori probability value (0.05 level of significance), otherwise do not reject. In addition, line graph was plotted to confirm the relationship between computer-mediated communication and risky sexual behaviours among adolescents' students.

## 3. Results

**Table 1. Frequency Table for Demographic Variables**

<b>Demographic Variables</b>	<b>N</b>	<b>%</b>
<b>Parenting styles</b>		
Authoritative	112	27.0
Authoritarian	142	34.2
Laissez-faire	161	38.8
Total	415	100
<b>Gender</b>		
Male	239	57.6
Female	176	42.4
Total	415	100
<b>Location</b>		
Urban	223	53.7
Rural	192	46.3
Total	415	100

Table 1 showed the demographic variables in frequency and percentage. In terms of gender, male in-school adolescents were 239 (57.6%) while the female adolescent students were 176 (42.4%). In terms of location, adolescent students from urban area were 223 (53.7%) while adolescent students from rural area were 176 (46.3%).

### 3.1. Research Questions

The research questions in the study were answered as follows:  
Research Question 1: What is the extent adolescent students engage in computer-mediated communication?

**Table 2. Mean and Standard Deviation Showing the Extent of Adolescent Students Engagement in Computer-Mediated Communication (N = 415)**

S/N	Items	$\bar{X}$	SD	Decision
1.	I enjoy making romantic phone calls with my friends	3.41 ±	.80	High Extent
2.	I do sex chat with friends in either Facebook, WhatsApp, Twitter, 2go, Skype, BBM, Badoo, Myspace, Instagram, Pinterest, Skyrock, Usenet,	3.33 ±	.94	High Extent
3.	I send romantic text messages through one or more of e-mail, blogs, SMS.	3.49 ±	.69	High Extent
4.	I send my nude pictures to friends through Facebook, WhatsApp.	3.33 ±	.84	High Extent
5.	I paste my nude pictures online	3.52 ±	.69	High Extent
6.	I make conference chat with friends about sex	3.44 ±	.80	High Extent
7.	I make mid-night calls discussing about love and I like online dating.	3.37 ±	.85	High Extent
9.	My boy or girl friend's first contact was through social network.	3.51 ±	.66	High Extent
10.	My phone number is available online for	3.44 ±	.77	High Extent
11.	If I like somebody I search for his/her phone number online so that I can call him/her.	3.44 ±	.77	High Extent
12.	I enjoy night sex chatting.	3.44 ±	.76	High Extent
13.	I enjoy night sex chatting.	3.39 ±	.73	High Extent
14.	If I like somebody's picture online I make effort to see the person physically.	3.53 ±	.59	High Extent
15.	I go through peoples' profile online to know whether I can make contact.	3.38 ±	.65	High Extent
16.	I follow pornographic celebrities on Facebook,	3.43 ±	.59	High Extent
17.	I download pictures and videos that show naked people or sexual activities.	3.11 ±	.74	High Extent
18.	I like calling my lover (s)	3.34 ±	.72	High Extent
19.	My lover calls me every time.	3.26 ±	.71	High Extent
19.	Phone calls and chats enable me to maintain	2.92 ±	.81	High Extent
	<b>Cluster mean</b>	<b>3.37 ±</b>	<b>.34</b>	<b>High Extent</b>

The results in Table 2 show that the extent in-school adolescents engage in all the listed computer-mediated communication is high. The cluster mean of 3.37 with standard deviation of 0.34 is indication that the extent in-school adolescents engage in computer-mediated communication is high.

### 3.2 Research Question 2

What is the extent adolescent student engage risky sexual behaviours?

**Table 3. Mean and Standard Deviation Showing the Extent of Adolescent Students Engagement in Risky Sexual Behaviours (N = 415)**

S/N	Items	$\bar{X}$	SD	Decision
1.	I enjoy having unprotected sex with anybody	3.18 ± .83		High Extent
2.	I don't use sex toys (e.g., a vibrator) during sex.	2.62 ± 1.22		High Extent
3.	I watch or view people that do sex in TV, phone, computer etc.	3.37 ± .85		High Extent
4.	I derive sexual pleasure from touching somebody.	3.51 ± .66		High Extent
5.	I have sex somewhere other than a bed (e.g., floor, bush, shower, kitchen, rest room).	3.44 ± .76		High Extent
6.	I don't Prefer oral sex over normal intercourse.	3.44 ± .67		High Extent
7.	I become aroused by voyeurism (e.g., Peeping Toms).	3.44 ± .76		High Extent
8.	I have sex without condom.	3.39 ± .74		High Extent
9.	I become aroused by watching pornographic images.	3.20 ± .83		High Extent
10.	I do not have sex with more than one person at the same day.	3.14 ± .79		High Extent
11.	I do not have sex with stranger.	3.24 ± .93		High Extent
12.	I don't force somebody to have sex with me.	3.17 ± .81		High Extent
13.	I do not prefer anal sex to normal intercourse.	3.27 ± .79		High Extent
14.	I take drugs to enable me have sex well.	3.29 ± .70		High Extent
15.	My sex partner has other sex partners.	3.40 ± .61		High Extent
16.	I exchange sex for money.	3.33 ± .74		High Extent
	<b>Cluster mean</b>	<b>3.27 ± .36</b>		<b>High Extent</b>

*M=mean, SD= Standard deviation*

The results in table 3 show that the extent adolescent students engage in all the listed risky sexual behaviours is high except for those behaviours expressed in items 2, 6, 10, 11, 12 and 13. Overall, the cluster mean of 3.27 with standard deviation of 0.36 confirm that the extent adolescent students engage in risky sexual behaviours is high.

### 3.3. Research Question 3

What is the extent of the relationship between computer-mediated communication and risky sexual behaviours among adolescent students?

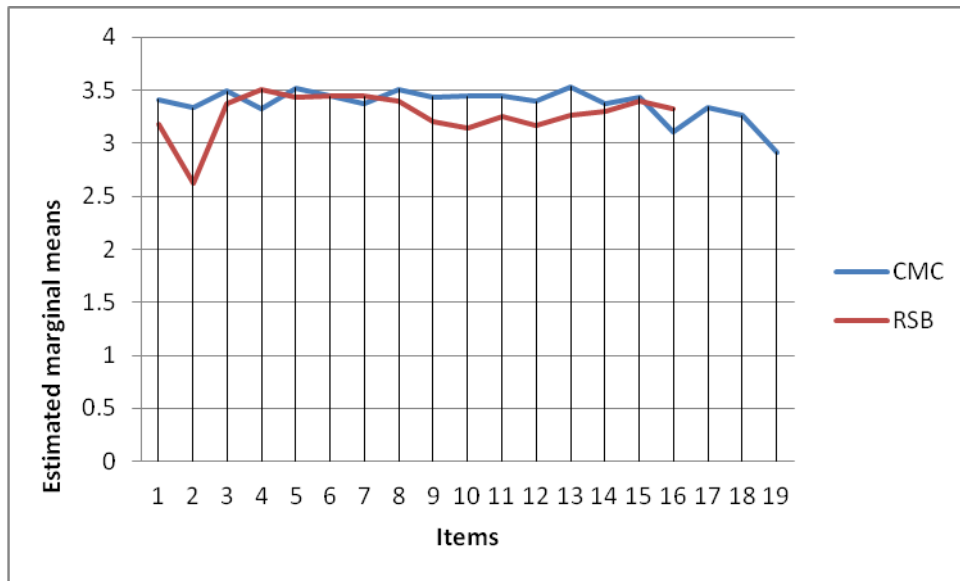
**Table 4. Pearson Correlation Analysis Showing the Extent of the Relationship between Computer-mediated Communication and Risky Sexual Behaviour among in Adolescent Students**

Variables	N	$\bar{X}$	SD	r	Decision
Computer-mediated communication		3.37 ± .33			
Risk sexual behaviours	415		3.27 ± .36	.77	High Extent

r=Pearson Correlation Coefficient, N=total number of respondents.

From table 4 it is observed that in-school adolescents had mean score of 3.37 with standard deviation of 0.33 in the use of computer-mediated communication, and mean score of 3.27 with standard deviation of 0.36 in their engagement in risky sexual behaviours. The value of the correlation coefficient (r), which is 0.77 indicate that the extent of the relationship between computer-mediated communication and risky sexual behaviours is high.





**Figure 1. Graphical Representation of the Relationship between Computer-Mediated Communication (CMC) and Risky Sexual Behaviours (RSB) among Adolescent Students**

Figure 1 shows the graphical representation of the relationship between computer-mediated communication and risky sexual behaviours among adolescent students. The estimated marginal means indicate the extent of adolescent students' engagement in computer-mediated communication (blue line) and risky sexual behaviours (red line). The vertical grid lines link each item to its estimated marginal mean. It is observed that the lowest mean in computer-mediated communication is 2.9 (item 19) while the highest mean is 3.5 (items 5 & 13), whereas the lowest is in risky sexual behaviours is 2.6 (item 2) while the highest is 3.5 (item 4). This therefore confirms the high extent linear relationship existing between computer-mediated communication and risky sexual behaviours among adolescent students.

### 3.4. Hypothesis Testing

There is no significant relationship between computer-mediated communication and risky sexual behaviours among adolescent students.

**Table 5. Summary of Regression Analysis for the Relationship between Computer-mediated Communication (CMC) and Risky Sexual Behaviour (RSB) among Adolescent Students**

Variables	N	F	R <sup>2</sup>	$\beta$	Sig.	Decision
CMC	415	610.85	.597	.772	.000	Rejected
RSB						

*Predictors: (Constant), CMC. Dependent Variable: RSB; df = 1, 413; p < .05.*

The results in Table 5 shows that computer-mediated communication significantly predicts risky sexual behaviours among adolescent students,  $R^2 = .59$ ,  $F(1, 413) = 610.85$ ,  $\beta = .77$ ,  $p < .05$ . Since the exact probability value (.000) is less than the a priori probability value (0.05), the null hypothesis which states that there is no significant relationship between computer-mediated communication and risky sexual behaviours among

adolescent students is rejected. The  $R^2$  value of .59 shows that computer-mediated communication accounts for 59% of the variance in risky sexual behaviours. The Beta ( $\beta$ ) weighting of .77 indicates that for every standard deviation unit change in computer-mediated communication, risky sexual behaviour will rise by .77 (77%).

#### 4. Discussion of Findings

The study found that the extent adolescent student engage in computer-mediated communication is high. This is to say the degree adolescent students use computerized devices to aid interpersonal interaction is high in Nigeria. From the findings, it is clear that as computer-mediated communication has risen in popularity over the past years, adolescent students have been found spending an excess amount of time on the internet in general and social networking sites in particular in addition to call makings. For instance, they make calls with phones, chat with or send message to friends in one or more of Facebook, WhatsApp, Twitter, 2go, Skype, BBM, Badoo, Myspace, Instagram, Pinterest, Skyrock, Usenet, YouTube, Foursquare among others. They also send text messages through one or more of e-mail, blogs, SMS among others; send pictures to friends through Facebook, WhatsApp among others; paste pictures online; involve in online dating; contact opposite sex friends through social network; make phone number available online for potential or new friends to call; search for friends through facebook; download pictures and videos that show naked people or sexual activities; learn how to do sex online; maintain distance friendships through chatting, messaging and phone calls; assist their friends to get the phone number of the person they love and hide number to call somebody. These findings support Walther (1996) who observed that when communicating through an electronic medium, individuals are less likely to engage in stereotyping and are less self-conscious about physical characteristics, and thus become comfortable engaging deeply on the communication. Adolescent students therefore find it easier to relate with other people within and outside their locations without fear or trembling. The finding is consistent with Ling (2004) who argued that mobile telephony has emerged as the most integral resource that adolescents use to exercise their autonomy and align themselves with peer culture because of its communicative function. Thus, adolescent students are comfortable communicating through computer-mediated approach than face-to-face approach because of comfort and anonymity computer-mediated communication afforded them. The finding is also in line with Lenhart's (2010) assertion that adolescents throughout the country regularly use the internet and cell phones to gather information and communicate with each other. The finding support Nielsen (2009) who observed that adolescents look to social networks as a key source of information and advice and they also use online searches to gain answers to many of their health concerns and this has significantly increased their engagement in computer-mediated communication. Furthermore, the finding is in line with Lenhart, Ling, Campbell and Purcell (2010) who observed that adolescents have found that they gained more independence and freedom through owning a cell phone that enable them to communicate with their parents or friends and that they often use voice calling to seek out social support when needed to discuss personal matters. The finding is also in congruent with Bishop's (2009) finding that individuals exploit the features of social media to make their best impression and attract attention, thereby making face-to-face meetings less attractive. Again, the finding is in line with Campbell and Park (2014) who observed that computer-mediated communication has become a primary resource for adolescents to expand and test boundaries.

Computer-mediated communication has made it easier for individuals, including in-school adolescents to engage in communication with others despite of time or location. Without computer-mediated communication system it would be difficult for in adolescent students to establish and maintain interpersonal relationships especially with people

outside their household. Since adolescent students in the study area have at least one mobile device that can browse, make call, send text messages or chat and they are as well and are exposed to internet operations, and online chatting using Skype, Myspace, Instagram, Facebook, 2go, Twitter, Badoo and other platforms, they are likely to face some consequences of such communication system. However, as noted in the background of the current study, there is evident of high rate of adolescents' hang-out, especially in the evening and night hours, around recreational centers and hotspots in Nigeria and this habitually make the adolescent students susceptible to risky sexual behaviour.

Another finding of this study is that the extent adolescent student engage in risky sexual behaviour is high. The adolescent students are expose to risky sexual behaviours such as inconsistent condom use, sex with multiple partners, caressing of opposite sex mate, rape, sexting, sexual harassment, unwanted touch, unwanted kiss, attempted rape, 'half-naked' dresses, having sex at an early age, having sex while under the influence of alcohol or drugs, unprotected with infected person, early sexual activity, having sex with somebody who has a multiple sex partners, having sex with a partner who injects or has ever injected drugs and exchange of sex (sex work) for drugs or money among others. The finding is in line with Olugbenga-Bello, Adebimpe and Abodunri (2009) who reported high rates of risky sexual activities among Nigerian adolescents. The finding is consistent with Hewett, Menschl and Erulkar (2014) who established that risky sexual behaviour among adolescents is high.

These findings confirm that risky sexual behaviour is peculiar to adolescence period since the adolescents start experiencing marked changes in their sexual structure in response to puberty. The period makes the individuals conscious of their sexes, and become attracted to each other, especially opposite sex. They develop persistent desire and passion for opposite sex friendship and this pushes them to high extent of engagement in risky sexual behaviours as established in this finding. Since this study has also found that the adolescent students extent of engagement in computer-mediated communication is high, one may say that there is relationship between computer-mediated communication and risky sexual behaviours because in-school adolescents are using computerized devices such as phone, i-pad and laptop among others to facilitate their interpersonal interactions.

The study also found that the extent of the relationship between computer-mediated communication and risky sexual behaviours among adolescent students is high. It was further confirmed that there is a significant relationship between computer-mediated communication and risky sexual behaviours among adolescent students. In particular, it seems that the more an adolescent student engages in computer-mediated communication, the more he or she engages in risky sexual behaviours. Thus, the high extent of engagement in computer-mediated communication may be responsible for the high extent of engagement in risky sexual behaviours among adolescent students. Therefore, one may state that adolescent students may not have engaged highly in risky sexual behaviours if they did not engage highly in computer-mediated communication. This is particularly true because, as noted earlier, computer-mediated communication allows individuals to relate with others comfortably even without the knowledge of the individuals' real identity. It is therefore possible for the adolescent students to be deceived in romantic relationships as they may be too young to understand the intricacies of such relationships. This finding is in line with Postmes, Spears and Lea (2013) who posited that when communicators share a common social identity, they appear to be more susceptible to group influence, social attraction, stereotyping, gender typing, and discrimination in anonymous computer-mediated communication. Although computer-mediated communication gives people the opportunity to traverse social boundaries, paradoxically, it can also afford these boundaries greater power, especially when they define self- and group identity. The finding is consonance with Walther (1996) who found out that the role that anonymity plays in online communication can also encourage some users to be less defensive and

form relationships with others more rapidly, and be at risk of relationships with 'evil' consequences which may result in risky sexual behaviours. The finding furthermore agrees with Ramirez and Zhang (2007) who opined that computer-mediated communication allows more closeness and attraction between two individuals than a face-to-face communication.

Based on this finding, there is need for emphasis on extent computer-mediated communication spreads misinformation, perpetuates myths of safe sex, and how it can encourage risky sexual behaviours. Such misinformation, myths, and encouragement feature scenes of unprotected sex, and the consumption of such information is associated with having sex with multiple partners, engaging in paid sex, and other risky sexual behaviours.

## **5. Conclusion**

There is no gainsaying the world is fast becoming a global village and as a result people, including adolescent students, have dived into the use of computer-mediated communication to boost up interpersonal interactions. The present study demonstrates that high extent of adolescent students' engagement in computer-mediated communication resulted in high extent of their engagement in risky sexual behaviours and there is significant relationship existing between computer-mediated communication and risky sexual behaviour. Thus, implications, recommendations and suggestions for further study are therefore drawn in this study based on this conclusion.

## **6. Implications for Childhood Sex Education and Counselling**

The findings of the study have implication for childhood sex education and counselling. This is because it may be possible that if sex education and counselling are provided for individuals at childhood stage they may not fall victims of risky sexual behaviour. The finding that the extent adolescent students engage in computer-mediated communication is high implies that adolescent students are using computer-mediated devices, such as phones, laptops, desktop computers, i-pads among others to boost up their interpersonal interactions. Thus, there is high tendency that the adolescent students will establish and maintain interpersonal relationships with people they do not really know and such relationship might result in unpleasant experience. Also, there is high propensity that the adolescent students' high engagement in computer-mediated communication will predispose them to romantic relationships with the opposite sex since computer-mediated communication can enable them to reach out to each other at convenience and this may make them always susceptible to risky sexual behaviours if their use of computer-mediated communication is not subjected to control. Thus, there is need for childhood educators and counsellors to guide individuals on the proper usage of computer-mediated communication from the childhood stage before they reach adolescence stage of development.

The finding that the extent adolescent students engage in risky sexual behaviours is high implies that the adolescent students are involved in sexual practices which might result in unwanted pregnancy and sexually transmitted infections as the primary consequences; unsafe abortion, early marriage, stillbirths, Vesico Vaginal Fistular (VVF) and death as the secondary consequences. Thus, the adolescent students may not be able to grow, develop and function well as they are likely to be exposed to a lot of physical, psychological, mental, social and biological challenges such as stunted growth, low self-esteem, loss of self-confidence, loss of memory, feelings of frustration, feelings of rejection, self-downing and depression among others. Hence, the educational pursuit of the adolescent students will be thwarted if their engagement in risky sexual behaviours continues.

The finding that the extent of the relationship between computer-mediated communication and risky sexual behaviour among adolescent students is high; and that there is significant relationship between computer-mediated communication and risky sexual behaviours implies that the more adolescent students use computer-mediated devices to enhance interpersonal interactions the more they are susceptible to risky sexual behaviours. This is dangerous as it shows the tendency for adolescent students to lose focus in school and be distracted because their romantic partners ('boy friends' or 'girl friends') are likely to be calling or chatting with them every time. Also, through the computer-mediated communication, the adolescent students would have opportunity to be discussing, especially through WhatsApp, 2go, Facebook, among others, about sex and how they can meet to have sexual experiences. They can share opinions, pictures, stories and information regarding sex within their network and all these have negative consequences. On the whole, adolescent students' engagement in risky sexual behaviours will continue to be high in as much as their engagement in computer-mediated communication is high and the relative consequences of the risky sexual behaviours such as unwanted pregnancy and sexually transmitted diseases including HIV/AIDS and other reproductive health challenges will continue to be the country's concern if the adolescent students' use of computer-mediated communication is not regulated. It could be that the reason for the high extent relationship between computer-mediated communication and risky sexual behaviours is because adolescent students are lacking computer-mediated communication and sexual behavioural counselling. Thus, the menace arising from computer-mediated communication and risky sexual behaviours may persist until computer-mediated communication and sexual behavioural counselling are fully implemented in primary and secondary schools.

## 7. Recommendations

The following recommendations were made based on the findings and the implication of this study:

- Proper and adequate sexuality education should be given to adolescent students to help them avoid risky sexual behaviours.
- Prompt computer-mediated communication orientation should be given to adolescent students to help them overcome negative influences of such communication system.
- More counsellors should be employed and retrained through in-service training programmes, capacity building workshops and refresher courses on computer-mediated communication and sexual behavioural counselling. Moreover, there should be a paradigm shift in methods, approaches, skills and techniques of counselling. Since the world is going global and technological, counselling should follow the same trend to be able to solve the 21<sup>st</sup> century problems and challenges of the adolescent students.
- Just like a child who is not up to 18 years old is not allowed to vote or be voted for during general elections or to own voter card in Nigeria, a child that is below 18 years old should not be allowed, by law, to own cell phone, laptop or computer with internet access or engage in computer-mediated communication without proper and adequate orientation.
- Teachers and school heads should collaborate with school counsellors (where available) to provide the necessary information and knowledge regarding the use of computer-mediated communication and engagement in risky sexual behaviours to students.
- School curriculum and schedules should provide enough time for extra-curricular activities so that counsellors can utilize the time to help students on personal-social matters such as computer-mediated communication and risky sexual behaviour. In addition, schools should develop and implement gender-friendly programmes that

will focus on computer-mediated communication and risky sexual behaviours among the students.

- Adolescent students should make conscious effort to avoid being involved in the wrong use of computer-mediated communication and risky sexual behaviours.
- Researchers should develop e-counselling model for the modification of risky sexual behaviour among adolescents. This model might be the quickest and most effective method of modifying risky sexual behaviour arising from engagement in computer-mediated communication among adolescent students.

## 8. Limitation of the Study

It is imperative to state here that though the present study provides important clues for future researchers, it is not far from some limitations. First, the school principals were misunderstanding the subject of investigation. They considered the study to be something that might have negative influence on the students or implicate the schools. This delayed their approval due to ethical considerations until the researcher explained to them what the study really means.

Another limitation of this study was in the aspect of sampling. The pre-survey that was carried out to find out students with the needed characteristics for the study was quite challenging as many students did not show positive response even when they were qualified to take part in the study. Consequently, the researcher had to access all the public secondary schools in the area in order to identify qualified participants for the study.

Again, it was not easy for the students to understand the concept of computer-mediated communication and risky sexual behaviours until they were enlightened. Due to privacy issue, some of the respondents appeared to be sensitive in giving honest responses. However, the researcher and the research assistants explained to the respondents that the information needed were for research purpose only.

## Approval of the Study

This study has been approved by the research committee of the Department of Educational Foundations, University of Nigeria, Nsukka.

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