Gender difference, class level and the role of internet addiction and loneliness on sexual compulsivity among secondary school students

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ABSTRACT
The study separately examined gender and class level differences in sexual compulsivity and determined the contributions of loneliness and internet addiction in explaining sexual compulsivity among secondary school students. A convenience sample of 311 male and female secondary school students with age range of 13–21 years (M = 15.61, SD = 1.63) completed a cross sectional survey that comprised demographic information and measures of loneliness, internet addiction and sexual compulsivity. Hierarchical regression statistics showed that both feeling of loneliness and internet addiction significantly contributed to level of sexual compulsion with internet addiction recording higher scores. Male secondary school children reported higher sexual compulsion than their female counterparts. Class level has no significant influence on sexual compulsivity but its effects appeared to increase as students advanced in classes. Comprehensive sexual education and preventive interventions with emphasis on intensive parent-child communication as well as internet use control for proper upbringing of children are recommended.

Introduction
Excessive sexual thoughts and desires among secondary school children may eventually result to sexual compulsivity if students are not properly guided on how to control or manage the feelings. As noted in Herkov (2016), The National Council on Sexual Addiction and Compulsivity defined sexual addiction or compulsivity as engaging in persistent and escalating patterns of sexual behaviour acted out despite increasing negative consequences to self and others. Kalichman and Rompa (1995) constructed a Compulsive Scale (SCS) and described it to measure the tendencies toward sexual preoccupation and hypersexuality. From these definitions, an individual who has compulsive sexual behaviour is obsessed with sexual thoughts and will continue to be overexcited about acting out the sexual feelings, irrespective of any negative outcomes. In line with the SCS, sexual compulsivity can be defined as the degree to which secondary school children are preoccupied with sexual thoughts and desires; and agitated about practicing these feelings regardless of negative consequences. Secondary school children who
are preoccupied with sexual thoughts, feelings, desires, behaviour or hyper-sexuality that interfere with their normal functioning could be said to be high in sexual compulsivity.

Studies on the prevalence of sexual compulsivity and its associated factors have mostly been conducted outside Nigeria (Black, 1998; Chaney & Burns-Wortham, 2015; Grov, Parsons, & Bimbi, 2010; Torres & Gore-Felton, 2007). Most of these earlier studies were on university students, homosexuals, HIV positive men and women (Grov et al., 2010; Torres & Gore-Felton, 2007), with secondary school children largely neglected. A study on secondary school children in Nigeria is therefore timely, particularly in view of the growing trend of unsupervised internet use which may put them at risk of being exposed to several indecent sexual-related activities. In addition, the lack of or inadequate attention and monitoring from parents predispose many secondary school children to feelings of loneliness; thus, putting them at risk of different social vices. The present study examined internet addiction and feeling of loneliness as possible predicting factors to sexual compulsivity among secondary school children.

Sexual compulsivity has been severally reported to have association with higher consumption of alcohol and substance use (Kalichman & Cain, 2004), anxiety, mood disorders and impulse control disorders (Grant & Steinberg, 2005; Raymond, Coleman, & Miner, 2003); and involvement in high risky sexual behaviour such as unprotected sex, drug-induced sex, increased number of sexual partners could lead to HIV and other sexually transmitted infections (Dodge, Reece, Cole, & Sandfort, 2004; Grov et al., 2010; Kalichman & Rompa, 2001; Reece, Plate, & Daughtry, 2001). Other researchers have reported the likely consequences of sexual compulsivity in individuals to include interpersonal conflict and distress, psychological distress and avoiding work responsibilities (Muench & Parsons, 2004). It is therefore important to note from the aforementioned studies that investigating internet addiction and feelings of loneliness as possible predictors of sexual compulsivity, especially in secondary school population is very relevant.

Extreme use of Internet may be regarded as a form of addiction to the use of Internet. While there is no standard definition yet to the concept of Internet addiction, however, Young (1998) defined Internet addiction as an impulse-control disorder that does not involve the use of intoxicating drugs. In the current study, we define Internet addiction as an excessive and irrepressible use of Internet affecting daily activities of an individual. Internet addicted secondary school children pass time with online chatting, games and various forms of discussion forums. In the course doing these, they are exposed to sex-related ideas that could inform their sexual behaviour.

Existing studies indicate that there is a high prevalence of internet addiction among secondary school students (Bruno et al., 2014; Sasmaz et al., 2013). No doubt, internet use is very relevant for students considering the various benefits. However, addiction to it could have unpalatable consequences, especially on young children if there is no monitoring or control from matured or experienced guides. To support this assertion, Griffith (2001) explained internet addiction as a factor in students’ lives since it could lead to neurological complications, psychological disturbances and relational disorder. Also, Xianhua et al. (2013) stated that students who used internet scored significantly higher in hyperactivity-impulsivity and that better parental relationship could serve as a moderator to the risks of internet addiction. Of course, excessive sexual thoughts cannot be ignored as a possible result of excessive use of internet by secondary school children; and this might have effect on their beliefs, orientation and purpose of human sexuality.

Asides internet addiction, loneliness in a growing child could easily predispose him or her to taking unguided decisions on certain behaviour such as sexual expressions. Feeling of loneliness is a form of social isolation whereby an individual feels he or she is no longer close to anyone. Feeling of loneliness has been reported to be associated with interpersonal communication and social interaction problems (Frye-Cox & Hesse, 2013). The feeling of being alone or isolated might put some secondary school children at risk of involving in compulsive sexual behaviour; perhaps, as an emotional regulation to the feelings of loneliness. In other words, sexual compulsion may be exploited as a coping mechanism to the feeling of loneliness. Few studies have investigated sense of loneliness as a possible predicting factor to sexual compulsivity. For instance, Torres and Gore-Felton (2007) reported that feeling of loneliness is associated with sexual compulsive behaviour and substance abuse to influence sexual risk behaviour.
This suggests that a secondary school child who feels lonely is at risk of engaging in sexual compulsive behaviour and substance abuse; and may end up engaging in various forms of sexual risk behaviour. Chaney and Burns-Wortham (2015) also informed that loneliness along with non-disclosure of sexual orientation to mother and self-esteem predict sexual compulsivity. These suggest the relevance of loneliness in determining sexual behaviour in individuals.

Sexual compulsivity is a heterogeneous behaviour. Thus, understanding gender difference may help identify which sex is more prone to sexual compulsion. Possibly, this will enlighten researchers on pathophysiology basis of sexual compulsivity as a disorder and further help for possible gender-related treatment approaches. In order to identify the likely demographic variables associated with sexual compulsivity among secondary school children, gender and class level differences in sexual compulsivity were investigated. Ayodele and Akindele-Oscar (2015) found that female adolescents reported higher relational preoccupation than their male counterparts. Similarly, McKeague (2014) reported that women’s sexually addictive behaviours are more relationally motivated. This suggests that while there could be gender disparity in sexual compulsivity, females exhibit their sexual addiction in a way different from men. In contrast to this, Dodge et al. (2004) reported higher scores for men on sexual compulsivity than for women. These prior studies have shown however, that there is gender difference in sexual compulsivity.

The objective of the present study was to examine gender and class level differences in sexual compulsivity and determine the contributions of loneliness and Internet addiction in sexual compulsivity among secondary school children in Nigeria.

Methods

Design

The study adopted a cross-sectional approach and employed an ex-post facto research design. The independent variables are gender, class level, Internet addiction and sense of loneliness, while the dependent variable is sexual compulsivity. Gender was measured in two levels (male & female); class in three levels (SSSI, SSSII & SSSIII), Internet addiction and sense of loneliness were measured on interval scale.

Participants

The study involved a convenience sample of 311 school children selected from four (4) Secondary Schools within Ibadan metropolis Oyo State, Nigeria. The sample included Senior Secondary School (SSS) students of I, II and III classes. Out of the 311 students, 140 (45%) were male and 171 (55%) were female with age range of 13 and 21 years ($M = 15.61$, $SD = 1.63$). Religion distribution of the students indicated that 213 (68.5%) were Christians, 93 (29.9%) were Muslims and 5 (1.6%) were of traditional religion. Class level showed that 100 (32.2%) were in SSSI, 75 (24.1%) were in SSSII and 136 (43.7%) were in SSS III.

Measures

Data were collected using a structured questionnaire that consisted of the above demographic characteristics and the following reliable scales measuring variables of interest in the study.

Sexual compulsivity was assessed through the adoption of the 10-item Sexual Compulsivity Scale (SCS) developed by Kalichman and Rompa (1995) and this was geared towards assessing tendencies toward excessive sexual preoccupation and urges. Responses on the scale were assessed on a 5-point Likert-type scale, ranging from ‘not like me’ to ‘Very much like me’. High score on the scale indicates a greater degree of sexual compulsivity in respondent. More importantly, SCS has been reported to have acceptable validity in various populations such as heterosexual and homosexual men and women, HIV positive men and college students regarding the evaluation of hypersexuality (Kalichman, Johnson, Adair, et al., 1994; Grov et al., 2010). Dodge et al. (2004) reported construct validity of the SCS; by
relating the scale with frequencies of sexual behaviour and number of sexual partners in a sample of heterosexual college students; and significant relationships were obtained. We reported alpha reliability coefficient of .89 in the current study.

Loneliness was assessed by 20-item UCLA Loneliness scale developed by Russell, Peplau, and Ferguson (1978); which was designed to measure individual's subjective feelings of loneliness and of social isolation. Respondents are expected to indicate on a 5-point Likert scale ranging from 'I never feel this way' to 'I often feel this way'. High score on the scale indicates a greater degree of loneliness in respondent. Russell (1996) reported internal consistency with coefficient ranging from .89 to .94 and test-retest reliability of .73. We reported alpha reliability coefficient of .92 in the current study.

Internet Addiction was evaluated by 20 items Young's Internet Addiction Test (YIAT20) developed by Young (1998). The scale assesses the degree to which respondents' internet use affect their daily routine, social life, productivity, sleeping pattern and feelings (Frangos, Frangos, & Sotiropoulos, 2012). Responses on the scale were assessed on a 5-point Likert-type scale, ranging from 'Rarely' to 'Always'. High score on the scale indicates a greater degree of internet addiction in respondent. In the current study, we obtained an alpha reliability coefficient of .73.

Ethical consideration and procedures

In order to ensure ethical consideration in data collection, an ethics application was made and approved by the Schools’ Ethical Committees where dates were given to physically meet with school principals. The school principals were further informed of the research objectives. Questionnaires were administered to students in their various classes. All participants were informed about the study and equally provided written consent. No compensation was given to the students for participating in the study. At the point of meeting with the students, we stressed that their names were not required in completing the questionnaires and that information given would be used for research purpose only. With 400 questionnaires distributed, 364 were retrieved altogether from the participants out of which, 311 were properly completed. These were used for data analyses in the study. The actual number of questionnaires used indicates a response rate of 77.75%; having discarded 53 that were not properly completed.

Statistical analyses

Data collected were subjected to analyses using IBM SPSS 24 version. Both descriptive and inferential statistics were computed in the study. Descriptive statistics such as mean, standard deviation and percentages were used to analyse demographic characteristics of the respondents. Inferential statistics of bivariate and hierarchical multiple regression were computed. A bivariate correlational analysis was conducted to observe relationships among all variables, after which two-model hierarchical multiple regression was used to test the independent and joint contributions of predictor variables in explaining the criterion variable in the study. At first stage, Internet addiction was entered and at the second stage, sense of loneliness was entered. Statistics were reported significant at .01 and .05 levels of significance.

Results

Bivariate correlation results

Results of bivariate correlation analyses on interrelationships of variables in Table 1 showed that age of respondents positively relates with class level \( (r = .58; p < .01) \) and internet addiction \( (r = .12; p < .01) \), but does not with loneliness \( (r = -.01; p > .05) \) and sexual compulsivity \( (r = .08; p > .05) \). Class level does not relate with internet addiction \( (r = .10; p > .05) \), loneliness \( (r = .01; p > .05) \) and sexual compulsivity \( (r = .06; p > .05) \). Internet addiction significantly and positively related to loneliness \( (r = .32; p < .01) \) and sexual compulsivity \( (r = .47; p < .01) \). Loneliness is positively related to sexual compulsivity \( (r = .38; p < .01) \).
Two-model hierarchical regression results

Results of a two-model hierarchical multiple regression in Table 2 showed that at first model, internet addiction contributed significantly to the regression model, $F(1, 309) = 88.63$, $p < .01$ and accounted for 22% of the variation in sexual compulsivity. Addition of loneliness in second model led to a significant increase to 28% of variation in sexual compulsivity with joint contribution to the regression model $F(2, 308) = 60.47$, $p < .01$. Similarly, at the second model, internet addiction ($\beta = .39$, $p < .01$) and loneliness ($\beta = .26$, $p < .01$) independently predicted sexual compulsivity among secondary school children.

In Table 3, gender difference in sexual compulsivity was investigated among secondary school children using t-test and it was found that male respondents ($M = 25.28$, $SD = 10.04$) significantly reported higher sexual compulsivity than their female counterparts ($M = 19.96$, $SD = 9.37$). The result indicates that there is gender difference in level of sexual compulsivity among secondary school children $t(309) = 4.82$, $p = .000$.

In examining the influence of class level on sexual compulsivity, One-way Analysis of Variance (ANOVA) was conducted and the results in Table 4 showed no significant influence of class level on sexual compulsivity $F(2, 308) = .58$, $p = .558$. However, observation of the graphical presentation of the class levels indicates that sexual compulsion increases as secondary school children get to higher class (see Figure 1).

Discussion

Correlational analyses revealed significant direct relationships between internet addiction and sexual compulsivity. This suggests that the more secondary school children are addicted to internet use, the more they are predisposed to sexual compulsive behaviours. It was also noted that internet addiction independently predicted sexual compulsivity among secondary school children. These findings are consistent with previous studies that have confirmed positive association between internet use and increased sexual behaviour orientation and hyperactivity in students (Adebayo, Udegbe, & Sunmola, Table 1. Mean, standard deviation and correlational matrix between variables in the study ($N = 311$).

| Variable          | 1    | 2    | 3    | 4    | 5    |
|-------------------|------|------|------|------|------|
| Age               | –    | –    | –    | –    | –    |
| Class level       | .58**| –    | –    | –    | –    |
| Internet addiction| .12* | .10  | –    | –    | –    |
| Loneliness        | −.01 | .01  | .32**| –    | –    |
| Sexual compulsivity| .08  | .06  | .47**| .38**| –    |
| $M$               | 15.61| 2.12 | 58.87| 51.14| 22.36|
| SD                | 1.63 | .87  | 19.07| 11.22| 10.02|

**$p < .01$; *$p < .05$.**

Table 2. Summary of hierarchical regression analysis for variables predicting sexual compulsivity of secondary school children ($N = 311$).

| Variable          | Model 1 |          | Model 2 |          |
|-------------------|----------|----------|----------|----------|
|                   | $B$      | SEB      | $\beta$  | $B$      | SEB      | $\beta$  |
| Internet addiction| .25      | .03      | .47      | .21      | .03      | .39**    |
| Loneliness        |          |          |          | .23      | .05      | .26**    |
| $R$               | .47      |          |          | .53      |          |          |
| $R^2$             | .22      |          |          | .28      |          |          |
| Adj $R^2$         | .22      |          |          | .28      |          |          |
| $R^2$ change (%)  | .22      |          |          | .06      |          |          |
| $F$               | 88.63**  |          |          | 60.47**  |          |          |
| $F$ change        | 88.63**  |          |          | 25.34**  |          |          |

**$p < .01$.**
Xianhua et al., 2013). It suggests that sexual compulsivity which could emanate from being preoccupied with sexual thoughts and desires are parts of the risks of problematic internet use or internet addiction in students.

It was further revealed that a significant direct relationship between loneliness and sexual compulsivity exists. This means that the more secondary school students feel lonely or isolated, the more they are preoccupied with sexual thoughts that could predispose them to sexual compulsive behaviours. Loneliness was found to have independent contribution in explaining sexual compulsivity in secondary school children. These findings are line with Torres and Gore-Felton (2007); who had earlier reported significant association between feeling of loneliness and sexual compulsive behaviour. Consequently, secondary school children who are left alone uncared or not catered for are exposed to risky behaviours that could jeopardize their future.

The results of hierarchical multiple regression also revealed that internet addiction and feeling of loneliness jointly predicted sexual compulsivity in this study. The finding corroborate with Chaney and Burns-Wortham (2015) who observed that loneliness along with other variables like non-disclosure of sexual orientation to mother and self-esteem predicted sexual compulsivity. However, Internet addiction was found to record a higher significant percentage. This explains how influential Internet addiction is in the formation of sexual orientations and ideas of human sexuality among secondary school children. Perhaps, Online Sexual Activities (OSA) as reported by Eleuteri, Tripodi, Petruccelli, Rossi, and Simonelli (2014) constitutes the major objective of internet use in this population; rather than for constructive learning and knowledge’s sake. Though, OSA has been reported to have some positive and negative facets, its negative and harmful sexual orientations are enduring.

Further, there was gender difference in sexual compulsivity. Male secondary school children were higher in sexual compulsivity than their female counterparts. This finding corresponds with Dodge

| Table 3. | Table 4. Summary of one-way ANOVA of class levels on sexual compulsivity. |
| DV | Gender | N | Mean | Std | df | t | P |
| Sexual compulsivity | Male | 140 | 25.28 | 10.04 | 309 | 4.82 | .000 |
| | Female | 171 | 19.96 | 9.37 | |

| Source | Sum of squares | df | Mean squares | F | P |
| Between groups | 117.58 | 2 | 58.78 | .58 | .558 |
| Within groups | 30,995.81 | 308 | 100.64 | |
| Total | 31,113.39 | 310 | |

**Figure 1.** Presents a graphically analysis of classes of secondary school children and their level of sexual compulsivity.
et al. (2004) that men are more sexually compulsive in behaviour than women. This gender difference can be attributed to the socio-cultural factors that appear flexible towards the male in terms of sexual expression than to the female. We also examined class level differences in the way secondary school children report sexual compulsivity. No substantial difference was found in sexual compulsivity. However, there was an indication that as the students’ progress in classes, there is a possibility of becoming more preoccupied with sexual thoughts. This is in line with the report of Perry, Accordino, and Hewes (2007) that upper class students had an increase in sexual sensation seeking than lower class students. Possibly, students learn from their mates or become more knowledgeable in the search for sexual-related information.

Conclusions

In view of our findings, the following conclusions are put forward: First, internet addiction and sense of loneliness significantly (independently and jointly) contributed in explaining level of sexual compulsivity among secondary schoolchildren with internet addiction recording higher contribution. Second, there is gender difference in the level at which secondary school children reported sexual compulsivity with male students recording greater level. Though, class level did not significantly influence sexual compulsivity in students however, there is a signal that students may be more preoccupied with sexual thoughts that could lead to sexual compulsive behaviours as they get advance in classes.

Recommendations

The outcomes of this study are imperative considering the sensitivity of sex among teenagers. It is therefore recommended that there should be sexual education and preventive intervention with emphasis on smooth parent-child communication as well as internet control measures for proper upbringing of children (both at home and in schools). We recommend that school environment should be made friendly enough for secondary school children to discuss their sex-related challenges without fear. Also, school-based programmes should be implemented with focus on educating secondary school children at all levels on sexual risk behaviour and risk factors as well as how they can overcome disturbing sexual thoughts. At home, parents should create time for open discussion between them and their wards on sensitive issues like sex and its associated risk factors as well as possible coping strategies. Specifically, parents should give enough time for their wards and monitor their activities off and in schools. All these could be achieved with the involvement of school psychologists or counsellors.

Author’ contribution

A.M.L. conceived and designed the study. A.M.L wrote the methods and results sections and contributed to the introduction and discussion. E.S.I contributed to the introduction and discussion.

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Disclosure statement

The authors declare no conflict of interest.
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