IJPES
www.ijpes.com
International Journal of Psychology and Educational Studies
ISSN: 2148-9378

Gender and Age Differences in the Relationship between Sensation-Seeking and Sexual Risk-Taking Behavior among Adolescents

Annie N. NJAU[1], Lucas OTHUON[2], Paul OBURU[3]

[1] *Maseno University- Educational Psychology, Kenya* *0000-0001-6723-2680*

[2] *Maseno University- Educational Psychology, Kenya* *0000-0002-6088-0914*

[3] *Maseno University- Educational Psychology, Kenya* *0000-0003-0711-509X*

ARTICLE INFO

Article History
Received 17.05.2021
Received in revised form 11.01.2021
Accepted 11.08.2022
Article Type: Research Article

ABSTRACT

The study examined gender and age differences in the relationship between sensation seeking and sexual risk behaviors among secondary school students in Kenya. The study was conducted in Kisumu Municipality. Kisumu was chosen as it is one of the leading regions in HIV prevalence, estimated at 15%. The HIV prevalence was assumed to indicate a positive relationship between sensation seeking and high sexual risk-taking behavior. A sample size of 357 adolescents (44% males and 56% females) was drawn using a stratified sampling method from a population of 10,278 secondary school students. Descriptive statistics were used to analyze quantitative data, while the qualitative data was summarized thematically. The study's findings indicated that about half the adolescents were highly sensational seekers predisposing them to take risks. There also existed significant gender differences in the prevalence of sensation-seeking and sexual risk-taking behavior, with the male adolescents being higher risk-takers than their female counterparts. Similarities in the prevalence of sensation-seeking were also reported. However, this varied across ages and different gender. Female adolescents' sensation-seeking increased earlier in life than their male counterparts.Further, the study indicated gender differences in the adolescents' tendency to indulge in sexually risky behaviors due to their sensation-seeking. This behavior tendency was higher for males than for female adolescents. Additionally, the results indicated significant age differences, with the susceptibility to indulge in such risky behaviors increasing with advancement in age.

© 2022 IJPES. All rights reserved

Keywords:
Gender differences, age-related differences, sensation seeking, sexual risk-taking

1. Introduction

As a transitional period from childhood to adulthood, adolescence is often characterized by the heightened potential for recklessness and sexual risk-taking behaviors (National Research Council, 2007; Papalia et al., 2004). The neurological gap caused by the immature prefrontal cortex (PFC) and a developed limbic system, leading to several different developmental disorders, has been suggested to explain the propensity for risk-taking in adolescents (Bednar & Fisher, 2003; Ben Zur & Reshef - Kfir, 2003; Berk, 2007; Berns et al., 2009; Steinberg, 2008). These developmental inadequacies manifest themselves in risky decision-making processes and behaviors characteristic of adolescence. Additionally, it has been reported that the temporal gap resulting from these differing neurological developmental timelines propagates the need for increased sensation seeking among adolescents (Donohew et al., 2000; Zuckerman, 1994). For example, Zuckerman (1994) defines sensation seeking as a trait characterized by seeking varied, novel, complex, and intense situations and experiences, suggesting that neurological gaps increase adolescents' willingness to take physical, social, and

[1]Corresponding author's address: Atatürk University, Faculty of Education, Erzurum/Turkeynyn
e-mail: uluhaaan@hotmail.com
Citation: Njau, A. U., Othuon, L. & Oburu, P. (2022). Gender and age differences in the relationship between sensation-seeking and sexual risk-taking behavior among adolescents in Kenya. *International Journal of Psychology and Educational Studies*, *9*(4), 1356-1367. https://dx.doi.org/10.52380/ijpes.2022.9.4.594

financial risks for the sake of doing so of such experience. Research evidence, however, shows that high sensation seekers are more likely than low sensation seekers to be involved in risky situations indicating that the high sensation seekers are more risk enticed (Donohew et al., 2000; Greene et al., 2000; Zuckermann, 1991(b)). Donohew et al. (2000), in their study on the increase in risky sexual taking behavior among adolescents in the U.S., found out that impulsive decision making and high sensation-seeking behavior were contributing factors to sexual risk-taking behaviors that were common amongst adolescents. This finding is likely to be propelled by the differing yet important neurological development timelines that are important in decision-making decisions.

Other studies to determine the relationship between sensation seeking and sexual risk-taking confirmed a significant relationship. For example, Chandra et al. (2003), in their research to establish the relationship between high-risk sexual behavior and sensation-seeking, affirmed that indeed sensation seeking was an essential factor that contributed to high-risk sexual behavior. Similarly, in their study examining impulsivity, sensation seeking, and risk behaviors among HIV-positive and HIV-negative heroin users, Paydary et al. (2016) found that HIV-positive individuals scored high on the Barrat Impulsivity Scale and the Sensation Seeking Scale. They concluded that impulsivity and sensation-seeking are likely to render individuals susceptible to the practice of more risky behaviors. However, the generalizability of the results is limited because they rely on specific groups, such as heavy alcohol users and heroin addicts, who formed the sample of their study. According to the Kenya Health Demographic Survey (KDHS) of 2008, adolescents in Kenya aged 13-19 are sexually active, and 50% of the new HIV/AIDs infections occur among adolescents aged 15-24 (KNBS & ICF Macro, 2010). In addition, 1% of women and 9 % of men had more than one sexual partner during the last year preceding the survey (KNBS & ICF, 2010). Besides, 48% of all abortion cases are reportedly among girls aged 14 – 24 years (The Republic of Kenya, 2010). Ragnarsson et al. (2001), in their study carried out in Kenyan urban informal settlements, found that 28% of the women used condoms inconsistently and had multiple partners. These practices predisposed them to HIV/AIDS infections and unwanted pregnancies).

Prevalence of HIV and AIDS has widely been used to estimate the extent of sexual risk-taking (TICH, 2005). Although the HIV and AIDs prevalence in Kenya has reduced to 5.1 %, with that of young women aged 15 – 24 being 5.6 %, this prevalence is still considered high due to the detrimental consequences associated with the disease (Kenya National Bureau of Statistics (KNBS) & ICF Macro, (2010). Further, this situation signals the likelihood of unsafe sexual practices like non-condom use and multiple sexual partners among adolescents despite increased awareness and interventions against sexually risky behavior (Ragnarsson et al. 2001). These incidences indicate the existence of sexual risk-taking among adolescents. Thus, there is a need to examine the underlying relationships between factors that influence sexual risk-taking, providing necessary interventions to address the situation.

A study by Nyende (2011) examining the factors that predispose boys' risk-taking behavior in day secondary schools in Kisumu Municipality found that sexual risk-taking was the riskiest behavior boys engaged in, and that of all aspects of peers provided the most significant incentive for sexual risk-taking. This perspective was also supported by Nyasoro (2011), who carried out a study examining sexual activity among adolescent girls. However, Nyende's study was carried out among adolescent boys, while Nyasoros' was carried out among girls in Kisumu. The current study sought to explore more profound insights into the gender and age differences in the relationship between sensation seeking and sexual risk-taking behaviors amongst adolescents. This view would enrich the understanding of the sexual risk-taking behavior among adolescents and is, therefore, more likely to provide valuable information for policy formulation to address this concern.

As highlighted earlier, adolescent sexual risk-taking behavior is Kenya's leading reproductive health concern. This concern results from increased new HIV/AIDS infections among the youth aged 15-24 years and sexual irresponsibility characterized by increased abortion and unwanted pregnancy cases (The Republic of Kenya, 2010). Importantly, sexual intercourse has been pointed out as is the leading mode of HIV and AIDS infection (Raffaelli & Crocket, 2003; The Republic of Kenya, 2010). The increased HIV/AIDS infection is exacerbated by risky sexual behaviors such as early sexual debut, inconsistent use of condoms during sex, and multiple sexual partners (The Republic of Kenya, 2010). In Kisumu Municipality, the high prevalence of HIV/AIDs (11.2%) has been attributed to increased risky sexual behavior (TICH, 2005; The Republic of Kenya, 2009). This prevalence could be a manifestation of sexual irresponsibility (Njue et al., 2009).

Gender differences have widely been reported to moderate adolescents' sensation seeking and sexual risk-taking. For example, a study by Cross et al. (2013) indicated that male adolescents were more likely to venture into novel seeking behaviors, predisposing them to risk-taking behavior. They attributed these gender differences to culturally transmitted social norms and psychological mechanisms, promoting novel-seeking behaviors among male adolescents. These findings have been supported by several other researchers (Coulter, 2007; Rahmani & Lasarani, 2012; Rosenblit, 2001; Steinberg et al., 2008).

Similarly, age differences have been an important factor in adolescent sensation seeking, encouraging sexual risk-taking behavior. Steinberg et al., 2008 in their study examining age differences in sensation seeking and impulsivity, found out that age differences in sensation-seeking followed a curvilinear pattern, with sensation-seeking increasing in early adolescence and declining after that. The Kenya Health Demographic Survey of 2014 indicated that sexual risk-taking varied across the ages, with younger male adolescents being twice likely to engage in sexual risk-taking as their female counterparts (The Republic of Kenya, 2015).

This paper explores the age and gender differences in the relationship between secondary school students' sensation-seeking and sexual risk-taking behavior. This study is prompted by the existing research evidence, which indicates that the two variables are essential in adolescents' sexual risk-taking. However, most studies have examined these variables independently. Exploring the two variables, gender, and age will undoubtedly provide a richer insight for developing an intervention framework for adolescent sexual risk-taking behavior. The study will enrich the existing body of research by providing helpful information on the role of gender and age in moderating the relationship between adolescents' sensation seeking and their indulgence in sexual risk-taking behavior. The specific objectives of the study were:

- To establish the prevalence of secondary school students' sensation-seeking by gender and age.
- To establish the prevalence of sexual risk-taking among secondary school students by gender and age
- To determine the relationship between sensation-seeking and sexual risk-taking behavior among secondary school students by gender.
- To determine the relationship between sensation-seeking and sexual risk-taking behavior among secondary school students by age.

2. Methodology

2.1. Research Model

The study adopted descriptive surveys and correlational designs to collect and analyze data on secondary school students' sensation-seeking and sexual risk-taking behavior. The correlational design was used to determine the relationship between sensation seeking and sexual risk-taking behavior. Further, logistic regression was used to analyze the relationships since the dependent variable (sexual risk-taking) was dichotomous.

2.2. Research Population and Sample

The total population of the study included 10,278 students enrolled in 31 secondary schools within Kisumu Municipality. A sample of 384 students was drawn using stratified random sampling, with the type of school as the strata. Out of a sample of 384 student respondents, 27 cases with missing information on any indicator were dropped from the study, leaving a sample size of 357 student respondents from 10 schools in Kisumu Municipality, which translated to a nonresponse rate of 7 .03 %. The male respondents comprised 43.7 % (156) of the sample, while the female respondents were 56.3 % (201). Of all the respondents, 126 (35.3 %) were from single-sex schools, while 231 (64.7 %) were drawn from mixed schools.

2.3. Data Collection Tools and Procedures

The constructs of interest in the study were; sensation seeking and sexual risk-taking. Using Zuckerman's sensation scale V, sensation seeking was measured while risk-taking behavior was measured using a researcher-made questionnaire. Two focused group discussions and key informant interview schedules were used to supplement information on the constructs being measured by the instruments. The specific tools used to collect the relevant data are described below.

Adapted Zuckerman's Sensation Seeking Scale V (SSS V): Zuckerman's sensation seeking scale was used to measure the sensation-seeking behavior of adolescents in the secondary schools within the municipality. The Zuckerman Sensation-seeking Scale V is a forty (40) item scale developed by Zuckerman (1994) to assess sensation seeking. This scale measures the four subscales of sensation seeking: thrill and adventure seeking, disinhibition, boredom susceptibility, and experience seeking. The scale has 40 paired items. The items are answered as either true (coded 1) or false (coded 0). Some of the items in the scale were modified to reflect the Kenyan setting; for example, items on skiing, diving were replaced with swimming or boat riding. This modification did not affect the inter-item reliability of the scale, which was α= .72 before modification and α=.74 after modification. The scale was scored 1 point for every high sensation seeking option; thus, the highest possible score was 40. A score of 40 represented a high sensation-seeking individual, while a score of zero would represent very low sensation-seeking behavior. In the study, respondents scoring above 20 on the scale were categorized as high sensation seekers, while those scoring between 10 and 19 were classified as moderate sensation seekers and those below ten as low sensation seekers.

Risky Sexual Behavior Scale: This was a researcher-made questionnaire to determine adolescents' indulgence in risky sexual behavior. The questionnaire had ten items that focused on four sexual behaviors; sexual debut, number of sexual partners, sexual experience, and consistent use of condoms as protection during sex. Respondents who reportedly had ever engaged in high-risk sexual behavior were coded '1', and those who had never/had been involved in less risky behaviors were coded '0'. The five variables were added to obtain the composite variable for sexual risk-taking. Respondents coded '1' in the variables were categorized as high risk, while those coded as '0' were classified as low risk.

The researcher obtained the necessary approvals from the National Council of Science, Technology, and Innovations (NACOSTI), the Ministry of Education, and the School of Graduate Studies, Maseno University. The researcher then visited the sampled schools and informed the school administrators about the research and the timeline of when the research instruments could be used. During the scheduled days for data collection, the selected students were briefed on the study and informed about their voluntary participation, after which they individually filled in the questionnaires. Focus group discussions were organized during lunch breaks and in the evenings after the lessons with participants, the researcher took notes and moderated the discussion to keep the participants in focus. Verbatim responses were recorded in writing by the researcher with the respondents' permission, who felt uncomfortable with their voices being recorded. Since most of the respondents were below 18 years, the school administration was approached for the consent as 'local parentis' for parental consent to participate in the study. Two research assistants were trained to assist in data collection.

2.4. Data Analysis

Descriptive statistics were used to present the prevalence of sensation-seeking and indulgence in sexual risk-taking behavior by age and gender. In addition, logistic regression analyses were conducted to examine the relationship between variables in the study.

2.5. Ethical

The participants in the study were assured of confidentiality. Participation in the study was voluntary, and the questionnaires were anonymous. Respondents were asked not to give their name or the name of their school. Respondents unwilling to participate in the study were not forced to participate. Respondents were informed of the expectations and procedures of the study. The headteachers of the selected schools also signed to provide consent on behalf of the participants willing to participate in the study since most of them were from various locations outside the study area, and it would have been challenging to conduct parents for each participant.

3. Findings

The respondents' age ranged from 13 years to 19 years (M=16.2, SD= 1.6). The male respondents were 156 (43.7%), while the female respondents were 201 (56.3%). Of all the respondents, 126 (35.3%) were from single-sex schools, while 231 (64.7%) were drawn from mixed schools.

57 (16%) were low sensation seekers among the respondents, while 50 (14%) were high sensation seekers. Further, the data was split by gender to compare the prevalence of sensation seeking between female and male respondents.

Table 1. *Prevalence of Sensation Seeking by Gender*

Category	Low Sensation seeking	High Sensation seeking
All	57 (16.0%)	50 (14.0%)
Male	17 (10.9%)	33 (21.2%)
Female	40 (19.9%)	17 (8.5%)

Figure 1 shows the prevalence of sensation-seeking by age and gender. Table 1 indicated that sensation seeking was higher for male respondents (21.2%) than female respondents (8.5%). These differences were tested for significance using the Mann-Whitney U test since the data was ordinal; the results indicated that sensation seeking was significantly different across gender ($p < .05$).

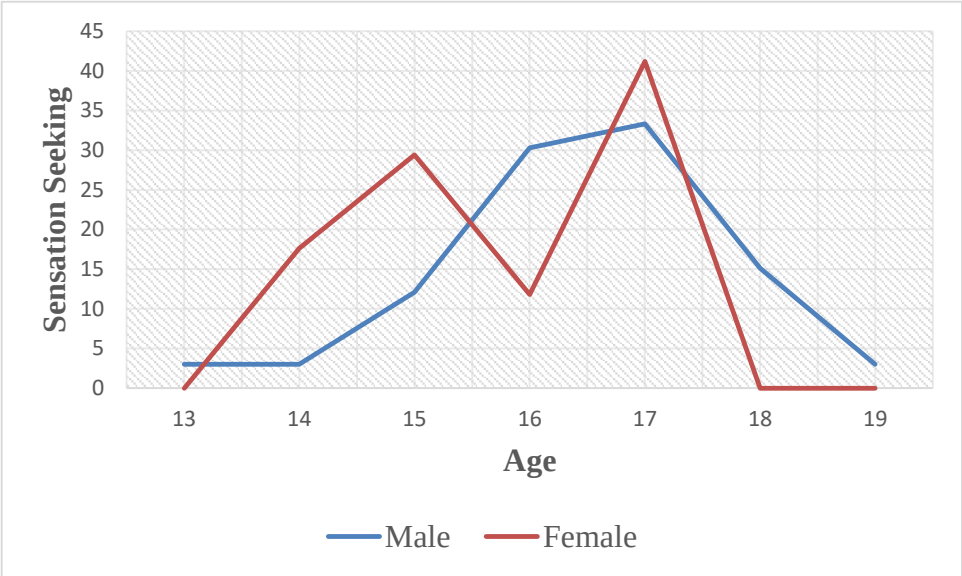

Figure 1. *Prevalence of Sensation-Seeking by Age and Gender*

From Figure 1, sensation-seeking for the male students was negatively skewed, increasing steadily from age 13 to a peak at 17 years, from where it steadily declined. Thus, sensation-seeking for boys was most pronounced at ages 16 and 17 years. Sensation-seeking girls had a bimodal distribution, with one group falling between ages 15 to just below age 16 and the other from age 17 upwards. Worth noting is that girls aged 18 and 19 displayed no sensation-seeking behavior. These results indicate varied implications for the consequences of sensation-seeking among secondary school students in Kisumu Municipality.

In the study, sexual risk-taking was conceptualized as a multidimensional concept reflecting four different behaviors: lifetime sexual experience, sexual debut, condom use, and multiple sexual partners. Table 2 presents the prevalence of the variables by gender. The gender differences for all the aspects were significant, as indicated by the Mann-Whitney U test of significance.

Table 2. *Prevalence of Sexual Risk-taking Variables*

Sexual risk-taking indicators	*Male*		*Female*		*Total*		*Mann-U Sig.*
	Non-Risk	*Risky*	*Non-Risk*	*Risky*	*Non-Risk*	*Risky*	
Sexual Experience	84(53.8%)	72(46.2%)	153(76.1%)	48(23.9%)	237(66.4%)	120(33.6%)	.000
Sexual Debut	26(36.1%)	46(63.9%)	20 (41.7 %)	28(58.3%)	46(38.3%)	74(61.7%)	.000
Condom use	42(58.3%)	30(41.7%)	29 (60.4%)	19(39.6%)	71(59.2%)	49(40.8%)	.008
Number of Partners	38(52.8%	34(47.2%)	28 (58.3%)	20(41.7%)	66(55%)	54(45%)	.000

Exploration of the prevalence of the four aspects of sexual risk-taking measured in the study, i.e., Sexual experience, condom use, sexual debut, and the number of sexual partners, indicated that all four aspects resulted in a negatively skewed distribution. This finding implied that male students' engagement in risky

sexual behaviors increased from around 14 years, steadily peaked at 17 years, and after that declined (See Fig. 2).

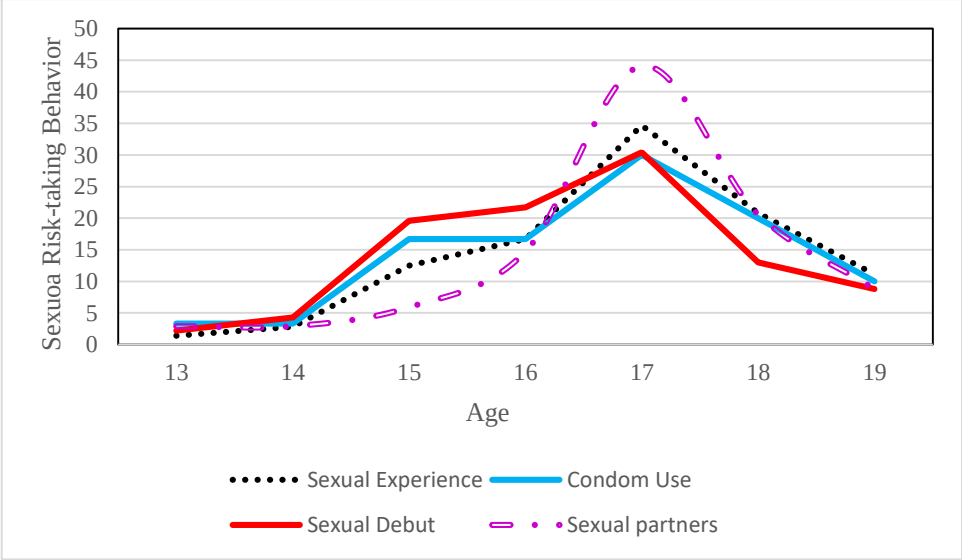

Figure 2. *Prevalence of Sexual Risk-taking Behavior among Boys*

The prevalence of sexual risk-taking behavior among boys is presented in Figure 2. The findings indicate that the modal age for each of the four risk-taking behaviors for boys is 17 years, i.e., that the prevalence for all the four aspects of sexual risk-taking was highest at age 17. In addition, the results indicated that more boys aged 17 years were most likely to engage in sex with multiple sexual partners.

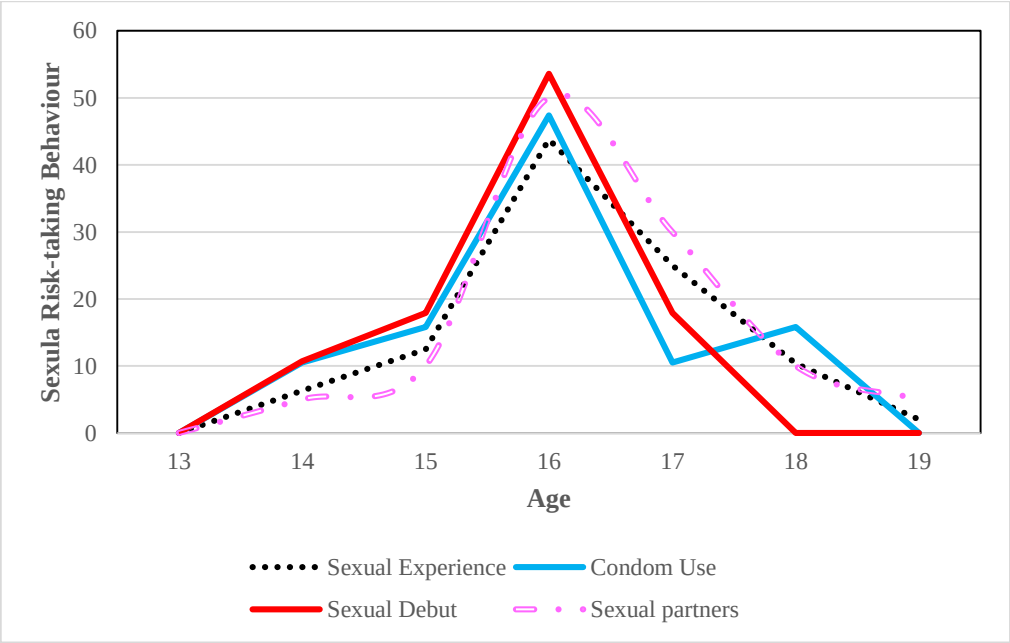

Figure 3. *Prevalence of Sexual Risk-taking Behavior among Girls*

All the four aspects included in the study to define sexual risk-taking (Sexual debut, condom use, sexual experience, and the number of partners) exhibited a steady increase until age 16, followed by a decline as the girls approached 19 years. This result indicated a slightly younger age for girls to indulge in sexual risk-taking than the boys, whose peak was 17 years. Furthermore, whereas sexual risk-taking behavior among boys exhibited a negatively skewed distribution with a peak at 17 years, that of girls resulted in a near-normal distribution with a peak at 16 years (See Fig. 3). This result implies that girls are more likely to indulge in sexual risk-taking behaviors than boys at a relatively lower age. Therefore, the consequences are likely to be more detrimental for girls than boys.

From Bivariate correlations (See Table 3), it is evident that all the aspects of sexual risk-taking correlated positively with sensation-seeking. Furthermore, among the four aspects of sexual risk-taking examined in the

study, the number of sexual partners correlated highest with sensation seeking, .223 (p <.05). This finding implies that increased sensation-seeking was likely to increase indulgence in sexually risky behaviors.

Table 3. *Bivariate Correlations*

Variables	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1. Age	1.00						
2. Gender	-.294**	1.00					
3. Sexual experience	.262**	-.234**	1.00				
4. Sexual debut	.062	-.190**	.719**	1.00			
5. Condom use	.085	-.141**	.561**	.501**	1.00		
6. Sexual partners	.268**	-.240**	.941**	.652**	.592**	1.00	
7. Sensation-seeking	.066	-.197**	.188**	.170**	.118*	.223**	1.00

***. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).*

Further, the Bivariate correlations indicated that age correlated positively and significantly with sexual experience (r=.262, p<.01) and the number of sexual partners (r=.268, p<.01). This finding implied that as age advanced, the likelihood of indulgence in sex increased and the likelihood of having multiple sexual partners. The correlation coefficients for sexual debut and condom use were insignificant; the sexual debut being aged linked variable could not significantly correlate with age. All the sexual risk-taking aspects correlated negatively and significantly with gender. This finding implied that male adolescents coded lower ('0') were more likely to engage in all the investigated aspects of sexual risk-taking than female adolescents coded higher ('1').

Table 4. *Relationship Between Sensation Seeking and Sexual Risk-Taking by Gender*

	H-L test	*Pseudo R^2*	*Wald Statistic*	*Sig.*	*Exp(B)/ OR*	*-2LL*	*% of correct prediction*
Sensation seeking	.023 (p>.05)	.048	11.483	.001	2.175	407.474	73.1
Boys	.538 (p>.05)	.036	3.989	.046	1.847	203.732	63.5
Girls	1.458 (p>.05	.028	3.366	.067	1.941	191.412	81.1

Logistic regression results indicated that sensation seeking significantly predicted sexual risk-taking among adolescents. The regression model with sensation seeking as a predictor correctly predicted 73.1 % of sexual risk-taking (See Table 4). EXP(B) value indicated that when sensation seeking is raised by one unit, an adolescent was 2.175 times more likely to engage in sexual risk-taking behavior (OR= 2.175 (95 % CI: 1.388 – 3.409)).

The model was found to be fit, $\chi 2$ (1) = .023 (p<.05), indicating that sensation seeking was a reliable predictor of sexual risk-taking among adolescents. In addition, the Wald statistic also indicated that sensation seeking made a significant contribution to the prediction of adolescents' sexual risk-taking behavior among the adolescents, $\chi 2$ (1) = 11.483, p <.05, See Table 4

When the results were analyzed by gender, the results indicated that sensation seeking significantly contributed to sexual risk-taking among male adolescents but not for female adolescents. Among male adolescents, the full model was significant compared with a constant-only model ($\chi 2$ (1) = 3.989, p <.05), indicating that sensation Seeking made a significant contribution to predicting male adolescents' sexual risk behaviors (p <.05). However, among female adolescents, it made no significant contribution ($\chi 2$ (1) = 3.366, p >.05), indicating that sensation Seeking made no significant contribution to predicting female adolescents' sexual risk behaviors (p = .067). The odds ratio indicated that a male adolescent was 1.847 times more likely to engage in sexual risk-taking behavior when a unit raised his sensation seeking (OR= 1.847 (95 % CI: 1.011 – 3.373).

Further, logistic regression analysis was conducted with sensation seeking and age as predictors of sexual risk behavior to determine age differences in the relationship between sensation seeking and sexual risk-taking behavior. From the test of the full model against a constant-only model, the results indicated that the full model was significant, indicating that the predictors as a set reliably distinguished between risk-takers and non-risk takers, $\chi 2$ (3) = 29.646, p <.001 (See Table 5). This finding confirms the significant positive correlation between age and the aggregated sexual risk-taking variable, .159, p<.01, as indicated in Table 4.1

Nagelkerke's R2 of .115 indicated a positive relationship between prediction and the grouping. Generally, the model's overall prediction was 73.7 %, indicating that the model with age and sensation seeking predicted 73.7 % of adolescents' sexual risk-taking behavior (See Table 5). The Wald criterion demonstrated that all the predictor variables significantly contributed to the prediction. EXP(B) value indicated that when sensation seeking is raised by one unit, the odds ratio was 1.084 as large, and thus an adolescent was 1.084 more times likely to engage in sexual risk-taking behavior (OR= 1.084 (95 % CI: 1.031 – 1.140)). Further, the model indicated a significant Wald statistic for age (9.540, p<.005). The EXP(B) value was 1.334, indicating that when age was raised by one unit, an adolescent was 1.334 more times as likely to engage in sexual risk-taking (OR= 1.334 (95 % CI: 1.111 – 1.601)).

Table 5. *Relationship between Sensation seeking, Age, and Sexual Risk-taking Behavior*

	H-L test	Pseudo R^2	Wald Statistic	Sig.	Exp(B)/ OR	-2LL	% of correct prediction	95% CI for or Lower	Upper
Sensation seeking	19.82(p>.05)	.115	10.007	.002	1.084	397.383	73.7	1.031	1.140
Age			9.540	.002	1.334			1.111	1.601
Constant			18.740	.000	.001				

When the analyses were split by gender, the results indicated that the model for the male adolescents was not fit. However, the model for the female adolescents was fit $\chi 2$ (2) = 9.057, p <.05, correctly predicting 81% of adolescent sexual risk-taking. Similarly, the Wald criterion demonstrated that all the predictor variables, sensation seeking and age, contributed significantly to predicting the female adolescents' sexual risk-taking. EXP(B) value indicated that when sensation seeking is raised by one unit, the odds ratio was 1.098 as large, and thus an adolescent was 1.098 more times likely to engage in sexual risk-taking behavior (OR= 1.098 (95 % CI: 1.011 – 1.192)). Further, the model indicated a significant Wald statistic for age (9.540, p<.005). The EXP(B) value for age was 1.364, indicating that when age was raised by one unit, a female adolescent was 1.364 more times as likely to engage in sexual risk-taking (OR= 1.364 (95 % CI: .098 – 1.889).

4. Conclusion and Discussion

The current study found that although sensation seeking existed for both genders, the prevalence of sensation seeking for male adolescents was higher than that of their female counterparts. This finding implied that the tendency to take up risky behavior due to the sensation it produces was higher for males than for female adolescents; that more male adolescents were likely to be sensation seekers as opposed to female adolescents. This finding would mean that male adolescents are more likely to venture into novel seeking behaviors, which would predispose them to risk-taking behavior, than female adolescents. Cross et al. (2013) assert that this is likely to have been occasioned by the social-cultural context within which the adolescents grow, which presents more permissiveness for the boy child than the restrictiveness exerted on the girl child. These findings corroborate those of the study by Rosenblitt et al. (2001), whose findings indicated higher sensation-seeking levels for male adolescents than their female counterparts. Rosenblitt and colleagues assert that this gender difference can be explained by evolved psychological mechanisms or culturally transmitted social norms, which seem to be permissive for male adolescents (Cross et al., 2013).

Comparison of sensation-seeking by age indicated variation across the ages, a trend that differed across the genders. For female adolescents, indulgence in the novelty of the experiences they produced began early. The trend increased steadily, adopting a bimodal distribution, with peaks at ages 15 and 17 before declining. At ages 18 and 19, girls displayed minimal sensation-seeking behavior. On the contrary, the prevalence of sensation seeking among male adolescents exhibited a negatively skewed distribution, increasing across the ages and rising to a peak at 17 years of age. The increase among male adolescents was less steep than that of female adolescents. The findings suggested an increased likelihood of sensation seeking-instigated consequences among female adolescents than their male counterparts since their susceptibility to sensation-seeking began early in life in female adolescents. These findings are equivalent to those of Steinberg et al. (2008), who found that sensation seeking followed a curvilinear pattern, increasing between ages 10 and 15 and declining thereafter. These results indicate varied implications for the consequences of sensation-seeking among secondary school students in Kisumu Municipality. This finding is pivotal in formulating age and gender- appropriate policies addressing adolescents' sensation seeking.

Further, the study indicated gender differences in the adolescents' tendency to indulge in sexually risky behaviors due to their sensation seeking. These results are further supported by Zuckerman's earlier findings (Zukerman, 1994) that indicated that men value risk-taking or sensation-seeking significantly more than women due to socialization, where women are socialized to "repress" sensation-seeking behaviors. In contrast, men are socialized to "express" themselves without recourse to the risks involved. Steinberg et al. (2008) and Rahmani and Lasarani (2012) also reported significantly greater sensation among males than females. These differences can be linked to what Paus (2009) described as sex differences in the cognitive abilities occasioned by the greater absolute volume of the grey and white matter among males than that of females. He further observed an age-related increase in the white matter volume of the left inferior frontal gyrus among boys but not girls. This increase is a possible explanation for boys' heightened inclination to sensation seeking during adolescence, likely to prompt risk-taking.

When examining the four aspects of sexual risk-taking (sexual experience, sexual debut, condom use, and the number of sexual partners) across genders and ages, it was found that male adolescents were more likely to engage in risky sexual behavior than their female peers, and this increased steadily across ages. This trend, combined with the increase in novel experience-seeking, is likely to explain the worrying trend of adolescents' indulgence in sexually risky behavior. Steinberg et al. (2009) corroborate this finding, as they concluded that sensation seeking was at its peak during adolescence. They explained that the differing timelines occasion this situation between developing the self-regulation system and the brain's impulse control. They concluded that vulnerability to risk-taking was the product of high sensation seeking and low impulse control.

These findings are congruent to Donohew et al. (2000), who established that sensation-seeking and impulsive decision making were strongly related to sexual risk-taking behaviors. Similarly, the findings corroborate Schweitzer (2011) that sensation seeking is a significant predictor of sexual risk-taking behavior, especially among males likely to have multiple sexual partners. Suggestively, sensation-seeking seemed to drive adolescents to want to have multiple sexual partners, probably because Zuckerman (1994) points out that sensational seekers are attracted to varied and arousing stimuli, and multiple sexual partners would be viewed as varied experiences for a sensation-seeking adolescent.

When examining the relationship between sensation seeking and sexual risk behavior using the logistic regression analyses, the study found that sensation seeking significantly predicted sexual risk behavior among adolescents. However, further analyses indicated that sensation seeking contributed significantly to sexual risk-taking behavior among male adolescents but not among female adolescents. The difference may be due to social and behavioral pressure to conform to the prescribed gender roles, as suggested by Booth and Nolen (2009), as well as culturally transmitted norms that encourage males to be more willing to take up novel/intense activities for the pleasure involved (Cross et al., 2013).

The study's findings contradicted those of Saxena and Puri (2013), which indicated a non-significant relationship between risk-taking ad sensation-seeking behavior among adolescents in the National cadet corps. In their view, this deviation is likely to have resulted from the sample used in the study. The sample comprised cadets trained to be patient and only be aggressive at suitable demands of the situation, not merely because of novel seeking (Saxena & Puri, 2013). Further, it is notable that Saxena and Puri examined risk-taking from a general perspective without narrowing it down to specific aspects of risk-taking, which is likely to have affected the study results. The current study narrowed down to sexual risk-taking as a specific aspect of risk-taking and explored a sample from a population not under any aggression/patience-focused training.

When the relationship between sensation seeking and the sexual risk-taking behavior aspects adopted in the study was examined, all the aspects correlated positively and significantly with sensation seeking. The correlation between sensation seeking and the number of sexual partners was highest, implying that high sensation seekers adolescents were likely to have multiple sexual partners. This finding suggested that sensation seeking appeared to drive adolescents to have multiple sexual partners, probably, as Zuckerman (1994) points out, because sensational seekers are attracted to varied and arousing stimuli. Multiple sexual partners would be viewed as varied experiences for a sensation-seeking adolescent. These results correspond to the findings of Zuckerman (1994) and Corsini (1999). They point out that sensation seekers underestimate or accept risk as the price for the reward provided by the sensation of the experience. That risk is not an essential motivation for the behavior but rather the experience the behavior provides. This inclination could

be the reason behind the relatively higher correlation between sensation seeking and multiple sexual partners, as that would provide the excitement so often sought by sensation seekers.

The results indicated that age was a significant predictor of adolescents' sexual risk-taking, with the tendency to indulge in sexual risk-taking increasing as adolescents advanced in age. In addition, as their susceptibility to sensation seeking increased, so did their likelihood of engaging in sexually risky behaviors.

In conclusion, the study found that more boys than girls tend to engage in sensation-seeking and risk-taking sexual behavior. Therefore, it is of utmost importance that appropriate measures are taken to channel their energies in positive, constructive ways. Further, it was established that sensation seeking correlated highest with the number of sexual partners among the indicators of sexual risk-taking. Therefore, it was concluded that although sensation seeking contributed significantly to secondary school students' sexual risk-taking behavior, it was likely to contribute most to engaging in sex with more than one partner.

Concerning age differences, the study established that the high sensation seeking began early for the girls. Consequently, the study concluded that the influence of sensation seeking was likely to be more detrimental for girls than boys. Therefore, preventive measures need to be adopted and exposed to the girls in early adolescence.

The relationship between sensation-seeking and sexual risk-taking indicated that sensation-seeking was a better predictor of sexual risk-taking behavior among boys than girls. The study concluded that boys who were sensation seekers were also likely to indulge in sexually risky behaviors. Since sensation-seeking promotes sexual risk behavior in boys, it is essential to develop prevention strategies differentiated by gender. Among the four indicators of sexual risk-taking, sensation-seeking accounted for the highest variance in the number of sexual partners. Adolescent students who were high on sensation seeking were also likely to have multiple sexual partners, a risk factor, especially for the spread of HIV.

The relationship between sensation-seeking and sexual risk-taking had significant differences across the ages, with advancement in age predisposing a stronger relationship between the two variables. Therefore, the study concluded that since age was a significant factor, the preventive measures/ strategies should be age differentiated.

5. Recommendations

The study suggested the following recommendations ;

- There is a need for the Secondary School Managers to diversify channels where secondary school students can redirect their energies to less risky activities to curb sensation-seeking behavior, which is likely to lead to sexually risky ventures.
- To effectively address secondary school students' sexual risk-taking behavior, it would be more effective for the Ministry of Education to develop and promote behavioral interventions embedded in their decision-making capacity rather than developing a list of do's don'ts.
- Since gender differences were eminent in prevalence and the relationships between sensation seeking and sexual risk-taking, the study recommended that the Ministry of Education develop and promote sexual risk-taking interventions that are gender-specific.
- That Educational stakeholders need to promote gender and age-specific behavioral interventions and communication on sexual risk-taking.
- The Ministry of Education should develop and promote sexual risk-taking interventions differently across the ages.
- The study recommends further research focussing on;
    - The neurological basis for increased sexual risk-taking due to sensation-seeking among boys compared to girls and the resultant age differences in the relationship between the two variables.
    - Adolescents outside school.

6. References

Bednar, D. E. & Fisher, D. T. (2003). Peer Referencing in Adolescent decision making as a function of perceived parenting style. *Adolescence, 38* (152), 607-622. http://findarti cles.com/p/articles.

Ben-Zur H. & Reshef-Kfir, Y. (2003). Risk-taking and coping strategies among Israeli adolescents. *Journal of Adolescence 26* (3), 255–265.

Berk, L. E. (2007). *Development through the Lifespan*. Peterson Educ. Inc.

Berns, G. S., Moore, S. & Capra, M. (2009). Adolescent engagement in dangerous behaviors is associated with increased white matter maturity of the prefrontal cortex. *PLOS ONE, 4*(8).

Booth, A. L. & Nolen, P. J. (2009). *Gender differences in risk behavior: Does nurture matter?* IZADP. No. 4026

Chandra, P. S., Krishna, V.A., Benegel, V. & Ramakrishna J. (2003). High-risk sexual behaviors and sensation seeking among heavy alcohol users. *Indian Medical Journal, 117,* 88-92.

Coulter, A. (2007). *Sensation seeking and self-efficacy's relationships to sexual risk-taking behavior* [Masters thesis]. Humboldt State University, California .

Cross, C. P., Cyrenne, D. M., & Brown, G. R. (2013). *Scientific Reports vol. 3*, No. 2486.

Donohew, L., Zimmerman R., Cupps, P. S., Novak, S., Colon, S., & Abell, R. (2000). Sensation seeking, impulsive decision making, and risky sex: Implications for risk-taking and design interventions. *Personality and Individual Differences, 28*(2000) 1079 – 1091.

Greene, K., Krcmar, M., Walters, L., Rubin, D. L., & Hale J. L. (2000). Targeting adolescent risk-taking behaviors; The contribution of egocentrism and sensation seeking. *Journal of Adolescence, 23* (4), 439 – 461.

Kenya National Bureau of Statistics (KNBS) & ICF Macro, (2010). *Kenya Demographic & Health Survey (KDHS) 2008/2009*. https://dhsprogram.com/pubs/pdf/fr229/fr229.pdf

Kuhn, D. (2006). Do Cognitive Changes accompany developments in the adolescent brain? *Perspective on Psychological Science, 1,* 59-67

Njue, C., Voeten, H., & Remes, P. (2009). Disco funerals: a risk situation for HIV infection among youth in Kisumu Kenya. *AIDs, 23* (4), 505 – 509.

Nyasoro, N. O. (2011). *Sexual activity among adolescents school girls in Kisumu County* [Doctoral dissertation,]. The University of Nairobi, Kenya.

Nyende, J.A. (2011). *Factors predisposing boys risky behaviors in boys' day secondary schools in Kisumu Municipality* [Master thesis]. The University of Nairobi.

Ongunya, R. O., Indoshi, F. C. & Agak, J. O. (2009). Objectives and actual HIV and AIDs education program delivery and behavioral changes among Kenyan secondary school students. *Educational Research& Review, 4*(4), 173- 182.

Papalia, E. D., Olds, S. W. & Fieldman, R. D. (2004). *Human development* (9th Edition). Mc Graw Hill Press.

Paus, T. (2009). Brain Development. *Handbook of adolescent psychology. Vol. 1: ındividual bases of adolescent development, 3rd Edition,* 95- 115.

Paydary, K., Torabi, S. M., SeyedAlinaghi, S., Noori, M., Noroozi, A., Ameri, S. & Ekhtiari, H. (2016). Impulsivity, sensation-seeking, and risk-taking behaviors among HIV positive and HIV negative heroin-dependent persons. *AIDs Research and Treatment, 2016.* http://dx:doi.org/10.1155/2016/5323256.

Ragnarsson, A., Ekstrom, A. M., Carter, J., Ilake. F., Lukhwaro, A., Marrone, G & Thorson A. (2001). Sexual risk-taking among patients on antiretroviral therapy in an urban ınformal settlement in Kenya. *Journal of International AIDs Society*. 14 -20.

Rahmani, S. & Lasarani, M. G. , (2012). Gender differences in the five-factor model of personality and sensation seeking. In *Procedia- Social and Behavioral Sciences, 46*, 2906-2911.

The Republic of Kenya (2009). *Kisumu East district development plan (2008- 2012).* Government Printers.

The Republic of Kenya, (2009). *National youth SITAN report 2009.* Government Printers.

The Republic of Kenya, (2010). *Kenya national human development report 2009: Youth and human development; tapping the untapped resources*. UNDP.

The Republic of Kenya (2015). *Kenya Demographic and Health Survey (KDHS) 2014.* https://dhsprogram.com/pubs/pdf/fr308/fr308.pdf

Saxena N. & Puri, P. (2013). relationship between risk-taking behaviors, personality, and sensation-seeking tendencies among NIC cadets. *IOSR Journal of Humanities and Social Sciences, 18* (3), 1-6.

Schweitzer, J. J. (2011) *Sensation seeking, message sensation value and sexual risk-taking: ımplications for teen pregnancy prevention campaigns* [Master thesis]. IOWA University.

Steinberg, L. (2008). A Social Neuroscience Perspective on Adolescent Risk-taking. *Developmental Review, 28*(1), 78 – 106.

Steinberg, L. (2008). *Adolescence.* Mc Graw Hill Co.

Steinberg, L., Cauffman, E., Banich, M., Graham, S. & Woolard, J. (2008). Age differences in sensation seeking and ımpulsivity as ındexed by behavior and self-report: Evidence for a dual systems model. *Developmental Psychology, 44*(6), 1764–1778.

Steinberg, L., Obrien, L., Cauffman, E., Graham S., Woolard J. & Banich M. (2009). age differences in future orientation and delay discounting. *Child Development, 80*, (1) 28 -44.

Zuckerman, M. (1991b). Sensation seeking: The balance between risk and reward. In L. P. Lipsitt, & L. L. Mitnick (Eds.), *Self-regulatory behavior and risk-taking: Causes and consequences (pp. 143–152).* Ablex Publishing Corporation.

Zuckerman, M. (1994). *Behavioral expressions and biosocial bases of sensation seeking*. Cambridge Press.