



Impulsivity and Sensation Seeking as Risk Factors for Adolescents Sexual Risk Taking Behavior in Kisumu, Kenya

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ABSTRACT

The study examined the extent to which impulsivity and sensation seeking predispose adolescents to sexual risk taking in Kisumu, Kenya. The study was carried out in Kisumu Municipality being one of the leading regions in Kenya in HIV prevalence (15%), a likely indication of high sexual risk taking. A sample size of 384 was drawn from a population of 10,278 secondary school students, but only 357 completed the study questionnaires. Quantitative data was analyzed using descriptive statistics while the qualitative data was summarized thematically. The male respondents comprised of 156 (43.7%) while the female respondents were 201 (56.3%). The results indicated that about half the adolescents in the study were highly impulsive and sensational seekers predisposing them to take up risks. Sensation seeking was a better predictor of sexual risk taking than impulsivity especially among the male adolescents, while impulsivity was a better predictor among female respondents. The study recommended that behavioral and communication strategies being developed for adolescents should be gender differentiated since male and female adolescents respond differently to the different aspects of sexual risk taking behaviors.

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Introduction

Adolescence represents a critical period when young people define their sexual values and often start to experiment with sexual behaviors that place them at a heightened risk of STDs and HIV/AIDS infections. This has made adolescent sexual risk taking behavior an area of great concern not only amongst developmental researchers but also to policy makers who intend to develop appropriate intervention strategies that can address adolescents' risk - taking behavior. This is because of the detrimental consequences associated with sexual risk taking e.g. STDs infections, unwanted pregnancies, abortions and deaths. Adolescence is a transitional period characterized by heightened potential for recklessness and sexual risk taking behaviors (National Research Council, 2007; Papalia, Olds, & Feldman, 2004). Sexual risk taking among adolescents has raised researchers' concern, first because of the numerous deaths amongst this particular group related to HIV /AIDS pandemic (Raffaelli & Crocket, 2003), and second, because adolescence is a discovery period characterized by increased propensity towards sexual experimentation that endangers the reproductive health of adolescents (Chege, 2000; Zietsch, Verweig, Bailey, Wright, & Martin, 2010). This increased risk-taking during adolescence can be linked to the developmental changes that accompany this period (Steinberg, Cauffman, Banich, Graham, & Woolard, 2008).

The explanation provided for the propensity towards risk taking links the neurological gap caused by an immature prefrontal cortex (PFC) and a developed limbic system that results into some differential developmental incapacitations among adolescents. These are manifested in risky decision making processes and behaviors that characterizes this particular period in the lifecycle cycle (Ben- Zur & Reshef – Kfir, 2003;

Bednar & Fisher, 2003), a heightened arousal for risk taking behaviors and a tendency for impulsivity (Steinberg, 2008).

Additionally, the temporal gap also propagates the need for increased sensation seeking (Zuckerman, 1994). This is particularly at a time when their regulatory or impulse control system is not mature enough to regulate this heightened arousal (Acton, 2003; Kershaw, 2003; Arnets & Joiner, 2007; Zuckerman, 1994; Donohew, Zimmerman, Cupps, Novak, Colon & Abell, 2000). The lack of self-regulatory systems within adolescents also increases their predisposition towards impulsivity (Acton, 2003; Moeller et al., 2001; Donohew et al., 2000).

One of the documented evidences on the link between impulsivity, sensation seeking and sexual risk taking was provided by the study carried out by the US Centre for Disease Control (CDC) survey indicating that college students aged 18 to 24 years frequently engaged in risky sexual behavior probably due to limitations of self-regulatory systems (Rolison & Scherman, 2003). The survey further indicated that in 2009, there was an increase in the number of new HIV infections among adolescents aged 13 –24 years with 34.2% of them reportedly falling in the sexually active group (CDC, 2009). Donohew et al, (2000), in their attempt to understand 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.

Concerns on adolescents' sexual risk taking are equally fundamental in Africa. The African Population and Health Research Center (APHRC) in 2009 pointed out that there was high prevalence of risky sexual behavior among adolescents characterized by increased deaths due to abortion, STDs and

HIV/AIDS infections as well as increased cases of unwanted pregnancies despite the various intervention programs put in place (APHRC, 2009). This, they suggest, calls for a deeper examination of the underlying mechanisms that predispose adolescents to increased sexual risk taking (Aguiyi, et al., 2010). Further, other studies suggest that adolescents were at an increased risk of contracting HIV/AIDS because they engaged in unprotected sex as a result of pressure from their peers to prove fertility or manhood (Hulton, Cullen & Khalokho, 2000).

In Kenya, the possible catalyzing impact of impulsivity and sensation seeking on increased sexual risk taking among adolescents has not gone unnoticed. Efforts put in place to arrest the impact have included putting in place national guidelines for the provision of youth friendly services in the country aimed at limiting irresponsible sexual practices among the youths in Kenya (Republic of Kenya, 2009; MOH, 2005; MOYAS, 2009). Although the HIV/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 (Republic of Kenya, 2009).

The major sexual risk taking behavior in Kenya have been identified as non-condom use, multiple sexual partners, early sexual debut and premarital sex (Ragnarsson et al., 2001; Ongunya, Indoshi & Agak, 2000; Republic of Kenya, 2008). According to KHDS (2008 and 2012), by age 13-19 most adolescents in Kenya are sexually active and that 50% of the new HIV/AIDS infections occur among adolescents aged 15-24 (Republic of Kenya, 2014). In addition 1% of women and 9 % of men had more than one sexual partner (Kenya National Bureau of Statistics (KNBS) & ICF Macro, 2010) and that 48% of all abortion cases are reportedly among girls aged 14 – 24 years (Republic of Kenya, 2010). A study by Ragnarsson and colleagues in Kenyan urban informal settlements indicated that 28% of the women used condoms inconsistently and had multiple partners (Ragnarsson et al., 2001). KHDS 2012, notes that, HIV transmission in Kenya occurs predominantly through heterosexual intercourse between an infected and non-infected person and that age at first intercourse marks the time when most individuals first risk exposure to infection (KNBS & ICF Macro, 2010; Republic of Kenya, 2014).

From the perspective of developmental psychologists, sensation seeking and impulsivity may predispose an individual's propensity to take up risks (Donhew et al, 2000; Steinberg, 2008). The current study was an examination of the extent of these factors' contribution towards adolescents' sexual risk taking in Kisumu.

While studies on impulsivity, sensation seeking and peer influence and how they relate to adolescent risky sexual behavior have widely been carried out in the West, few of such studies have been carried out in Africa suggesting the existence of gap that needed to be filled by the current study. As highlighted earlier, adolescent sexual risk taking is Kenya's leading reproductive health concern. This is as a result of increased new HIV/AIDS infections among the youth aged 15-24 years, and sexual irresponsibility characterized by increased abortion and unwanted pregnancy cases (Republic of Kenya, 2010). In Kisumu East district there has been a high prevalence of HIV/AIDS attributed to increased risky sexual behavior. Despite the national HIV/AIDS prevalence being low(5.1 %), that of Kisumu East district remains high at 11.2%, with that of the Municipality being 15 % compared to 8 % in the rural parts of the district (TICH, 2005; Republic of Kenya, 2009). This could possibly be a manifestation of sexual irresponsibility

(Njue et al., 2009). This suggested that in order to determine the possible vulnerability factors responsible to the documented higher HIV/AIDS rates in the proposed study area, there was need to understand the behaviors underlying the increased sexual risk taking. This study's novel contribution to extant literature was thus its assessment of how adolescents' sexual risk taking could be a function of developmentally instigated capacity to take up the risk. The objectives of the current study were;

- i. To establish the prevalence of adolescents' impulsivity, sensation seeking and sexual risk taking behavior in Kisumu Municipality.
- ii. To determine the relationship between adolescents' impulsivity and sexual risk taking behavior.
- iii. To determine the relationship between adolescents' sensation seeking and sexual risk taking behavior.
- iv. To establish the gender differences in the relationship between impulsivity, sensation seeking and sexual risk taking behavior.

Methodology

Study Design

The current study adopted descriptive survey and correlational designs to collect data on adolescents' impulsivity, sensation seeking and to determine the relationships underlying these variables. Since the dependent variable (sexual risk taking behavior) was dichotomous, logistic regression analyses was employed to analyze the relationships.

Study population

The total population of the study included 10,278 students enrolled in 31 secondary schools within Kisumu Municipality.

Sample size and sampling procedure

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 leaving a sample size of 357 student respondents from 10 schools in Kisumu Municipality.

Instruments for data collection

Barrat Impulsivity scale 11 (BIS 11) was used to collect data on impulsivity, Zuckerman's sensation seeking scale V (SSS V) used to collect data on sensation seeking while a researcher made sexual risk taking indulgence questionnaire was used to collect data on sexual risk taking behavior. Focused group discussions were also held to complement the self-administered questionnaires. The self-administered sexual indulgence questionnaire included items such as the number of sexual partners one had in the last one year preceding the study, how consistent one had used condom during sexual intercourse, sexual debut as well their sexual experience. BIS 11 and SSS V are scales originally developed for a western population, using information obtained from a pretesting of the instruments; the scales were adjusted appropriately for the Kenyan set up.

Data Collection Procedure

Two research assistants were trained in data collection. Selected schools were visited after necessary permits had been obtained from National Council of Science, Technology and Innovation (NACOSTI). The agency regulates the research process throughout the Country. Appropriate times for data administration were also arranged for, by the lead researcher. Participants voluntarily participated in the self-administered questionnaires and FGDs.

Data Analyses

Frequency and percentages were used to describe the demographic characteristics as well as the prevalence of

impulsivity, sensation seeking and sexual risk taking behavior. Logistic regression was used to examine the relationships between the dependent variable (sexual risk taking behavior) and the independent variables (sensation seeking and impulsivity). Gender differences among male and female students in sensation seeking and impulsivity were analyzed using cross-tabulation and the significance tested using Mann-Whitney U test at 95 % confidence level. Qualitative data was transcribed from notes gathered during FGDs and the presentation made alongside quantitative data, the se qualitative data complemented data obtained using the self-report questionnaires.

Results

Demographics

From the study population of 357 student respondents drawn from 10 schools in Kisumu Municipality, the mean age of the respondents was 16.2 years. The male respondents were 156 (43.7%) while the female respondents were 201 (56.3%). Out of all the respondents, 126 (35.3%) were from single sex schools while 231 (64.7%) were drawn from mixed schools.

Prevalence of Sensation Seeking

Among the respondents, 250 (70%) were moderate sensation seekers, 57 (16 %) were low sensation seekers while 50 (14 %) were high sensation seekers (see Fig1.1). To compare the prevalence of sensation seeking between female and male adolescents, the data was split by gender. The results as presented in Fig 1.1 indicated that sensation seeking was higher for male adolescents (21.2%) than female adolescents (8.5%). This implied that the tendency to take up risky behavior due to the sensation it produces was higher for male than for female adolescents

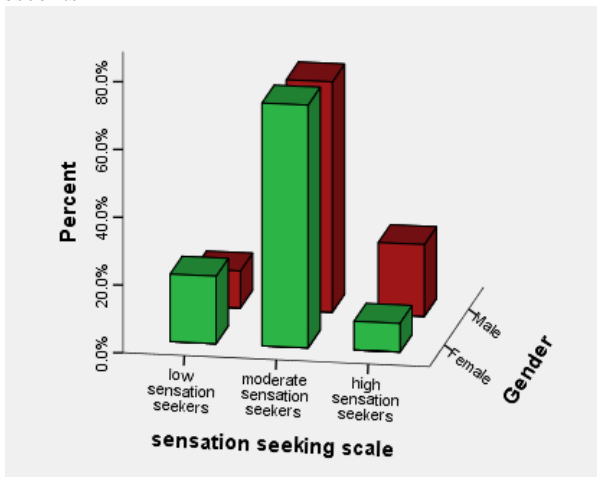


Fig. 1.1. Prevalence of Sensation seeking

Table 1.1 Prevalence of Sensation seeking and Impulsivity

	Impulsivity			Sensation seeking		
	Male	Female	Total	Male	Female	Total
Low	66 42.3%	91 45.2%	157 44%	17 10.9%	40 19.9%	57 16%
Moderate	76 48.7%	98 48.8%	174 48.7%	106 71.6%	144 71.6%	250 70 %
High	14 9.0%	12 6.0%	26 7.3%	33 21.2%	17 8.5%	50 14%

Prevalence of Impulsivity

The results indicated that 44 % of the respondents were low on impulsivity, 48.7 % were moderately impulsive while only 7.3 % were rated as highly impulsive. Comparing the results with those of sensation seeking, it was evident that a larger percentage of the respondents (44%) were low on impulsivity as compared to only 16 % of the low sensation seekers. When the

prevalence's were compared by gender, it emerged that the gender differences were not significant with regard to impulsivity as they were for sensation seeking. Mann-Whitney U test results indicated a p value of .092, resulting to the acceptance of the null hypothesis that there existed no gender differences in the distribution of impulsivity amongst the sampled respondents.

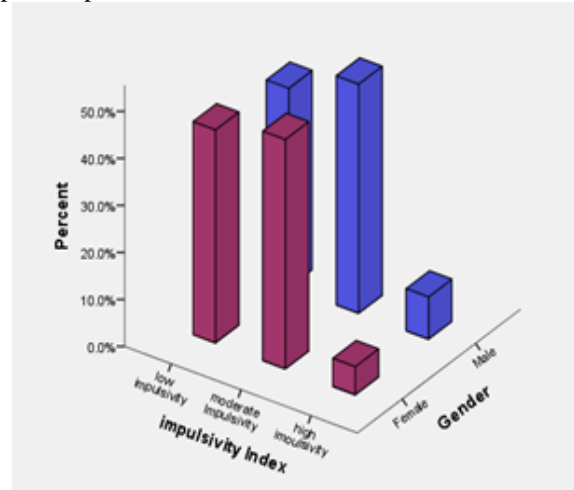


Fig 1.2 Prevalence of Impulsivity

Prevalence of Sexual risk taking

Sexual risk taking was conceptualized as a multidimensional concept reflecting five different behaviors namely; lifetime sexual experience, sexual debut, condom use, multiple sexual partners and alcohol/drug use before sexual intercourse. The results indicated that there were very few respondents who reportedly had sexual intercourse under the influence of drugs/ alcohol, the variable was eliminated from further data analysis. Confirmatory Factor Analysis confirmed this exclusion of sexual intercourse under the influence of drugs/alcohol as an indicator of sexual risk taking behavior since its factor loading was small (0.24). The results for each variable are presented in Table 1.2.

Table 1.2 Prevalence of Sexual risk taking Indicator

Sexual Risk Indicators	Male		Female	
	Low Risk	High risk	Low risk	High risk
Sexual Experience	53.8%	46.2%	76.1%	23.9%
Sexual Debut	36.1%	63.9%	41.7 %	58.3%
Non Condom use	58.3%	41.7%	60.4%	39.6%
Number of Partners	52.8 %	47.2%	58.3%	41.7%

From Table 1.2, 120 respondents had a lifetime sexual experience, which comprised of 33.6% of all the respondents. Out of these, 74 (61.7%) had their first sexual intercourse before they were 14 years old, 49 (40.8%) did not consistently use a condom in sexual intercourse. These results seemed to reflect the opinions of the adolescents during focused group discussions; respondents pointed out that although they considered condom use as a protective measure from sexually transmitted infections, they were reluctant to use it since they considered it 'uncomfortable' as it 'reduced enjoyment'. During focused group discussion, a third of the respondents reported that with the increased awareness in voluntary medical male circumcision (VMMC) in the region and its effect on reducing HIV/AIDs infection, there was a notion among the adolescents'

participants that they would adopt VMMC as a protective measure rather than use condoms. Some of the respondents said;

'Condoms are uncomfortable because they reduce enjoyment'
(A male adolescent from a Mixed school)

'Condoms usually trap the soup' (a female adolescents from a Mixed school)

'Now with circumcision no need for condom any more' (A male respondent from a Single sex school)

Table 1.3 Bivariate Correlations

	1	2	3	4	5	6	7	8
Gender	1.00							
School type	.011	1.00						
sexual experience	-.234**	-.045	1.00					
sexual debut	-.190**	-.013	.719**	1.00				
Condom use	-.141**	-.080	.561**	.499**	1.00			
sexual partners	-.254**	-.016	.938**	.692**	.524**	1.00		
sensation seeking	-.196**	-.005	.188*	.170**	.118	.209**	1.00	
impulsivity	-.043	-.075	.153**	.036	.097	.116	.078	1.00
Sexual risk taking	-.234**	-.034	.787**	.630	.966**	.209**	.126	1.00

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

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

The results indicated that 54 respondents (45%) had more than one sexual partner in the last one year before the study. The male adolescents reportedly had multiple sexual partners to act as a 'security measure' so that incase one partner left them they would always have replacements. A male adolescent from a single sex school said;

'You need many girls so that if one leaves you, you are left with the other, it also gives you experience and you feel good'.

The female adolescents had multiple partners, the richer one to finance their needs and the school boyfriend to provide company. This was a common perception that emerged during the focused group discussions.

Out of the four sexual risk taking variables, it was clear that most of the respondents were high risk takers with regard to sexual debut i.e. 61.7% had engaged in sex before they were 14 years of age.

When the prevalence of the sexual risk taking indicators were examined based on respondents' gender, differences across all the four sexual risk taking indicators was statistically significant at $\alpha = .05$. For sexual experience, a higher percentage of the male adolescents had ever engaged in sexual intercourse than the female adolescents, a difference that was statistically significant ($p = .000$), implying that male adolescents were more likely to be sexual risk takers with regard to lifetime sexual experience. One male adolescent pointed out that;

'Although we know it's (sex) negative consequences, it is not easy to avoid it; our 'feelings' keep driving us to it (sex)';

Another adolescent remarked;

'Chilling', (a sheng' term for keeping off premarital sex), is backward and it denies one an opportunity to gain sexual experience'.

Media and peer pressure were blamed as factors that promoted sexual engagement rather than abstinence. Similar trend was evident for all the four sexual risk taking variables.

Relationship between Impulsivity and Sexual Risk Taking

The correlation coefficient for composite sexual risk taking behavior and impulsivity was .126, $p < 0.05$. This showed that an increase in an adolescents impulsivity results to increased indulgence in sexual risk taking behavior. These suggest that adolescents who make decisions impulsively were also likely to

indulge more in risky sexual behaviors. When the relationship between impulsivity and individual variables for sexual risk taking was examined, the results indicated that all the four sexual risk taking variables correlated positively with impulsivity but only sexual experience and number of sexual partners were significant at 95 % confidence level (See Table 1.3). Of all the variables, sexual experience was found to have the highest correlation coefficient ($r = .153$; $p < .005$) (see Table 1.3). From the results impulsivity did not seem to contribute much to adolescent sexual risk taking behavior, however, because of the detrimental consequences associated with sexual risk taking among adolescents' health, any contribution albeit small is useful in efforts to address adolescent sexual risk taking. A logistic regression analysis was conducted to predict sexual risk taking using impulsivity as the predictor. A test of the full model against a constant only model was not statistically significant ($\chi^2(1) = 3.0$, $p > .05$), indicating that impulsivity did not make significant contribution to the prediction of adolescents sexual risk taking behavior ($p = .083$). EXP(B) value indicated that when impulsivity is raised by one unit the odds ratio is 1.023 times as larger and therefore an adolescent is 1.023 times more likely to engage in sexual risk taking behavior. Nagelkerke's R^2 of .012, was obtained which indicated a weak relationship between prediction and impulsivity. The prediction success overall was 72.5%; the model with impulsivity as a predictor correctly predicted 72.5% of sexual risk taking (see Table 1.4). Since the significance was greater than the set α level (.05), the null hypothesis, that the model with impulsivity as a predictor is significantly different from the one with the constant only was retained. This meant that impulsivity did not make significant contribution to the model. When gender differences were examined, the model relating impulsivity and sensation seeking was found to be significant for the female adolescents ($\chi^2 = 5.499(1)$, $p < .05$) and not for the male adolescents ($\chi^2 = .067(1)$, $p > .05$) as shown in Table 1.4.

Relationship between Sensation Seeking and Sexual Risk Taking

Sensation seeking was correlated with individual indicators of sexual risk taking behavior as well as with the composite variable. Correlations of the sexual risk taking indicators resulted to positive significant coefficients at 95% confidence level (.19, .17, .12, and .21 for sexual experience, early sexual debut, condom use and number of sexual partners respectively) (See Table 1.3). The correlation between sensation seeking and the number of sexual partners was the highest, $r = 0.209$, among the four indicators of sexual risk taking behavior.

Table 1.4 Relationships between Impulsivity, Sensation seeking and Sexual Risk Taking Behavior

	Pseudo R ²	Wald Statistic	Sig.	Exp(B)	-2LL	% of correct prediction
Impulsivity	.012	3.004	.083	1.023	416.545	72.5
Male	.001	.067	.795	1.070	207.812	61.5
Female	.044	5.499	.019	2.023	189.313	81.1
Sensation seeking	.045	10.987	.001	1.087	408.265	73.1
Male	.036	3.989	.046	1.847	203.732	63.5
Female	.028	3.366	.067	1.941	191.412	81.1
Developmental	.038	8.856	.003	1.484	409.986	72.5
Capacitation						
Male	.005	.527	.468	1.141	207.345	61.5
Female	.077	8.392	.004	1.863	185.025	81.1

Relationship between Sensation Seeking and Sexual Risk Taking

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The results of logistic regression analyses indicated the effects of sensation seeking on the model were significant, $\chi^2(1) = 10.987$, $p < .005$; indicating that sensation seeking made significant contribution to the prediction of adolescents sexual risk taking behavior ($p = .001$). EXP(B) value indicated that when sensation seeking is raised by one unit the odds ratio is 1.087 times as larger and therefore an adolescent is 1.087 times more likely to engage in sexual risk taking behavior. The regression model with sensation seeking as a predictor correctly predicted 73.1 % of sexual risk taking (see Table 1.4). Unlike impulsivity, sensation seeking appeared to be a better predictor of adolescents' sexual risk taking. This finding was also confirmed by the -2 log likelihood of the two indicators, where the -2 log likelihood coefficient for sensation seeking (408.265) was lower than that of impulsivity (416.545) as indicated in Table 1.4. This meant that sensation seeking was a better predictor of the sexual risk taking than impulsivity, a conclusion that was confirmed by the Nagelkerke's R^2 which was higher for sensation seeking (.045) than for impulsivity (.012).

When the results were analyzed by gender, the results indicated that sensation seeking significantly contributed to sexual risk taking for male adolescents but not for the female adolescents. Among the male adolescents, the full model against a constant only model was significant ($\chi^2(1) = 3.989$, $p < .05$). However it did not make significant contribution for the female adolescents ($\chi^2(1) = 3.366$, $p > .05$), indicating that sensation seeking did not make significant contribution to the prediction of female adolescents sexual risk taking behavior ($p = .067$). EXP(B) value indicated that when sensation seeking is raised by one unit the odds ratio is 1.941 times as larger and therefore a female adolescent is 1.941 times more likely to engage in sexual risk taking behavior, as compared to a male adolescent who is 1.847 times more likely to engage in sexual risk taking behavior.

Relationship between Impulsivity, Sensation Seeking and Sexual Risk Taking

To examine the relationship between impulsivity, sensation seeking and sexual risk taking behavior, logistic regression was conducted with sensation seeking and impulsivity as predictors. The results indicated that sensation seeking was a better predictor of sexual risk taking ($\chi^2(1) = 2.559$, $p < .05$) than impulsivity ($\chi^2(1) = 10.495$, $p > .05$) (see Table 1.5). However when the models for different genders were compared it emerged that while sensation seeking was a better predictor of sexual risk taking behavior for male adolescents $\chi^2(1) = 3.927$, $p < .005$, impulsivity was a better predictor of sexual risk taking behavior for the female adolescents ($\chi^2(1) = 5.022$, $p < .005$). The EXP(B) values were consistently higher for the female adolescents (see Table 1.5); indicating that when sensation seeking and impulsivity are each raised by one unit the odds ratios were larger for female adolescents and as thus the female adolescents were more likely to engage in sexual risk taking behavior as a result of sensation seeking and impulsivity, as compared to a male adolescents. This meant that female adolescents who were both impulsive and sensation seekers were more likely to engage in risky sexual behaviors more than their male counterparts.

Table 1.5 Relationship between Impulsivity, Sensation Seeking and Sexual Risk Taking Behavior

Gender		Pseudo R^2	Wald Statistic	Sig	Exp (B)	% prediction
Male	Impulsivity	.036		.979	1.007	63.5
	Sensation seeking		3.927		1.845	
	Constant		7.954		.312	
Female	Impulsivity	.068		.025	1.962	80.6
	Sensation seeking		5.022		1.876	
	Constant		2.906		.081	
			29.416	.000		

Discussion

The findings of the study implied that the tendency to take up risky behavior due to the sensation it produces was higher for male than for female adolescents; that more male adolescents were likely to be sensation seekers as opposed to the female adolescents. These findings corroborate those of Rosenblitt et al. (2001), in their study to examine sensation-seeking behaviors in male and female college students, which also indicated higher sensation seeking levels for male adolescents. Rosenblitt and colleagues assert that this gender difference may be explained by the inverse relationship between cortisol and sensation seeking in men.

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 do due to socialization where women are socialized to "repress," sensation seeking behaviors whereas men are socialized to "express" them without recourse to risks involved. The findings of Steinberg et al (2008) in their study to examine age differences in sensation seeking and impulsivity also corroborated these study, that males reported significantly greater sensation-seeking (.713) than females (.654); $F(1,427)=4.18$, $p < .05$. From the findings of the study, it was evident that male adolescents were more likely to be high sensational seekers than female adolescents a difference that was statistically significant. It is a general finding among researchers for men to score higher than women on measures of sensation-seeking. This sex difference has been explained in terms of evolved psychological mechanisms or culturally transmitted social norms (Cross, Cyrenne & Brown, 2013).

From the current study, it was evident that the prevalence of impulsivity was not as pronounced as that of sensation seeking. More respondents were of low impulsivity as compared to those who were low on sensation seeking. The results further indicated no significant gender difference with regard to impulsivity. This indicated that the distribution of impulsivity was the same for male and the female adolescents. These findings portray a contradiction of earlier findings by (Gatta et al., 2014), which found significant gender differences in adolescents' impulsivity. This difference may have resulted to the fact that Gatta and colleagues examined the different subscales of impulsivity (attentional, non-planning and motor) separately unlike in the current study where the subscales were combined. Their study found significant gender differences for the non-planning and the motor aspects of impulsivity while, like the current study it found no significant gender differences in attentional impulsivity.

Out of the four sexual risk taking variables, it was clear that most of the respondents were high risk takers with regard to sexual debut i.e. 61.7% had engaged in sex before they were 14 years of age. This implied that the adolescents in Kisumu

Municipality were engaging in sexual intercourse too early before their cognitive control system is fully developed to objectively appraise the risk involved, a situation researchers argue increases the risk associated with sexual intercourse (Berns, Moore & Capra, 2009; Steinberg, 2008). Researchers agree that early sexual debut poses great danger since the younger the adolescents the more vulnerable they were and the less skilled they are likely to be in negotiating for safer sex and therefore they risk dating violence, early pregnancies, HIV infections and other STIs (Robinson, 2010; Njue et al., 2009). These findings support the results of the Kenya Health Demographic Survey (KDHS) of 2008/2009; which identified Nyanza province's sexual debut at 16 years, and that age at first intercourse marked the time at which individuals' first risked exposure to HIV infection (Republic of Kenya, 2009; KNBS & ICF Macro, 2010).

Further the study found out that the adolescents had varying perceptions of using condom as a protective measure during sexual intercourse. Although most of them considered condom use as a protective measure from sexually transmitted infections, they were reluctant to use and would rather prevent pregnancy than infections. This poses a dangerous trend which is further complicated by increased misinformation of the role of VMMC in reducing HIV/AIDS infection. Clearly enjoyment was the driving force in sexual engagement and not safety.

The multiple sexual partners among male adolescents viewed as a 'security' measure would further compound the vulnerability of the adolescents to detrimental sexual outcomes.

With regard to sexual experience, male adolescents were more likely to be sexual risk takers with regard to lifetime sexual experience. Further, it implies that male adolescents were more likely to have had sexual intercourse than their female counterparts, a difference that was statistically significant at 0.05. Participants were quick to blame their urges and friends as the key drivers towards the urge to indulge in sexual intercourse. These results complement the finding of the KHDS of 2008/2009, that indeed more men than women are likely to begin sexual engagement earlier and are more likely to have multiple partners (KNBS & ICF Macro, 2010). These results replicate those of Puente et al, (2010) which showed a higher prevalence for sexual risk taking behaviors for boys than girls; boys had more sexual partners and used condoms less frequently than the girls.

The positive significant correlation between impulsivity and sexual risk taking suggested that adolescents who make decisions impulsively were also likely to indulge more in risky sexual behaviors. Further analyses indicated that impulsivity contributed more significantly to multiple sexual partners and having sexual intercourse. This implied that impulsive decision making was key in influencing adolescents to engage in sex and also to have multiple sexual partners, practices that indeed can have fatal effects on adolescents' lives.

Results of logistic regression indicated that impulsivity did not make significant contribution to the model, however, when gender differences were examined, the model relating impulsivity and sensation seeking was found to be significant for the female adolescents. This implied that while impulsivity seemed to be a predisposing factor to sexual risk taking among female adolescents' it was not a significant predisposing factor for male adolescents, as thus impulsive decision making seemed to threaten female adolescents' indulgence in sexual risk taking behavior. As for sensation seeking, the study established that the effects of sensation seeking on the model were significant; indicating that sensation seeking made significant contribution

to the prediction of adolescents sexual risk taking. Unlike impulsivity, sensation seeking appeared to be a better predictor of adolescents' sexual risk taking.

While impulsivity correlated highest with sexual experience, sensation seeking correlated highest with the number of sexual partners, implying that while adolescents who are highly impulsive are likely to indulge in sexual intercourse, those who were high sensation seekers were likely to have multiple sexual partners; implying that sensation seeking seemed to drive adolescents to wanting to have multiple sexual partners. This could be as a result of what Zuckerman (1994), points out that sensational seekers are attracted to varied and arousing stimuli and multiple sexual partners would be viewed as varied experience for a sensation seeking adolescent.

These results correspond to the findings of Zuckerman, (1994) and Corsini, (1999) who point out that sensation seekers underestimate or accepts risk as the price for the reward provided by the sensation or the experience and that risk is not an essential motivation for the behavior but rather the experience the behavior provides. This could be the reason behind the relatively higher correlation between sensation seeking and multiple sexual partners (.209) as that would provide the excitement so often sought by sensation seekers.

The study established that sensation seeking was a significant predictor of sexual risk taking. The results further indicated that sensation seeking significantly contributed to sexual risk taking for male adolescents but not for the female adolescents, indicating that sensation seeking did not make significant contribution to the prediction of female adolescents sexual risk taking behavior. This may be explained to be as a result of males' higher propensity to choose risky behaviors as well as social and behavioral pressures to conform to the prescribed gender expectations (Booth & Nolen, 2009; Taylor & Wong, 1996).

This gender difference may be as a result of the variances in culturally transmitted social norms that encourage men to be more willing to take up novel/intense activities for the pleasure involved (Cross et al, 2013); as such men would be more willing to take up risky sexual behaviors due to the sensation they produce while women would be more likely to take up such behaviors due to impulsive behavior.

Summary

The results indicated that there existed high prevalence of moderate sensation seekers among secondary school adolescents in Kisumu Municipality. The study also revealed that there existed significant gender differences in sensation seeking between male and female adolescents with the male adolescents being higher in sensation seeking. The prevalence of impulsivity was fairly equal between moderate and low impulsivity, with only a small percentage being of high impulsivity among the adolescents. There was no evidence of gender differences in the prevalence of impulsivity among the secondary school adolescents in Kisumu Municipality.

The study found out that a third of the secondary school adolescents had ever engaged in sex by the time when the study was being carried out. Majority of the respondents reportedly had had sex three months before the study with a significant percentage also reporting to having had sex two weeks before the study. Gender differences were significant with males having higher prevalence for sexual experience. Close to half of the male adolescents had had sex.

With regard to sexual debut, majority of the adolescents who had engaged in sex reported to have had their first sexual intercourse before age 14 years, a scenario that could highly

aggravate their exposure to sexually transmitted infections. The gender difference for early sexual debut was significant at 95 % confidence interval; with a greater percentage of the male adolescents having engaged in sex before age 14 years.

Consistent condom use during sexual intercourse was considered an important measure of sexual risk. More male adolescents than females had not used condom consistently as a protective measure during sexual experience in the last one year preceding the study.

About half the adolescents who were sexually active had more than one sexual partner during the last year preceding the study. The gender difference for multiple partners was significant with the more male adolescents having had more than one sexual partner during the last one year preceding the study.

The relationship between sensation seeking and sexual risk taking indicated that sensation seeking was a better predictor of adolescent sexual risk taking than impulsivity. The gender difference for this relationship was eminent with sensation seeking being a better predictor for sexual risk taking behavior among the male adolescents than the female ones. Among the four indicators of sexual risk taking, sensation seeking accounted for the highest variance in the number of sexual partners, indicating that, adolescents who were high on sensation seeking were also likely to have multiple sexual partners.

Conclusion

Most of the respondents were found to be of moderate sensation seeking, more males than females were found to be high sensation seekers. It was thus concluded that although most of the secondary school adolescents were moderate sensation seekers, it was still useful to put measures in place to channel their energies into positive, constructive avenues. Only a small proportion of the respondents were found to be highly impulsive, with no gender differences between male and female adolescents. It was concluded that although about half of the respondents were moderately impulsive, impulsivity was not a serious challenge among the adolescents.

Sexual risk taking was conceptualized as a latent variable with four indicators namely; sexual experience, non-condom use, multiple sexual debut and early sexual debut. For sexual experience, a third of the respondents were found to have had sex before the study. Since the mean age of the respondents was 16.2 years it was concluded that indeed these were worrying results especially in the advent of HIV/AIDS infection in the region especially for the male adolescents. Further examination into the sexual experience risk recency indicated that majority of the students engaged in sex at least three months before the study which implied that they had sex mostly when on school holidays.

Although majority of the respondents reportedly did not use condom during their last sexual experience, the percentage that was exposing themselves to sexually transmitted infections could not be ignored especially among the male adolescents. It was thus concluded that there is still much that needs to be done among adolescents to improve condom use.

Almost half of the respondents who had had sex reportedly had more than one sexual partner, a finding that was different across the genders with more males having two or more sexual partners than the female adolescents. It was thus concluded that multiple sexual partners was a serious risky sexual behavior among secondary school adolescents in Kisumu Municipality.

A more worrying finding was the results of sexual debut, which indicated high percentages of adolescents engaging in sex before age 14 years especially the male ones. It was concluded

that indeed early sexual debut was an aspect of concern with regard to addressing adolescents' sexual risk taking behavior.

The relationship between sensation seeking and sexual risk taking was found to be stronger than that between sexual risk taking and impulsivity. It was thus concluded that sensation seeking as an indicator of developmental capacitation was likely to result more to adolescents' engaging in sexually risk behaviors than impulsivity. In addition it was concluded that sensation seeking caused greater effect on sexual risk taking for male adolescents than for the female ones. It was worth noting that sensation seeking correlated highest with multiple sexual partners among the indicators of sexual risk taking, implying that sensation seeking was likely to contribute to engaging in sex with more than one partner. From this finding it was concluded that sensation seeking contributed significantly to adolescents' sexual risk taking.

Recommendations

The following recommendations were suggested from the findings of the study;

- i. That there was need to diversify channels where adolescents can redirect their energies to less risky activities to curb sensation seeking into sexually risky ventures.
- ii. To effectively address adolescents' sexual risk taking, it would be more effective to develop and promote behavioral interventions that are embedded on their decision making capacity rather developing a list of do's and don'ts which they will most often defy.
- iii. Since gender differences were eminent in prevalence as well as in the relationships of impulsivity, sensation seeking and sexual risk taking, the study recommended that sexual risk taking interventions should be developed and promoted with this gender differences in mind i.e. that Male and female adolescents are susceptible to different aspects of sexual risk taking.
- iv. That gender specific behavioral and communications on sexual risk taking need to be promoted.

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