

ORIGINAL RESEARCH

Predictors of risky sexual behaviour among young people in the era of HIV/AIDS: evidence from the 2008 Botswana AIDS Impact Survey III

Gobopamang Letamo*¹ and Lucky L. Mokgathe²

¹Department of Population Studies, ²Department of Statistics, University of Botswana, Private Bag UB 0070, Gaborone, Botswana.

*For correspondence: E-mail: letamog@mopipi.ub.bw; Phone: (+267) 3552710

Abstract

The objective of this study is to fill in that research gap by investigating factors that are likely to predict Botswana's young people's practicing risky sexual behaviour in the era of HIV/AIDS. Data used in this study were obtained from a nationally representative sample of 5,810 young people aged 15 to 29 who had completed an individual questionnaire of the 2008 Botswana AIDS Impact Survey III. Both descriptive and multiple regression analyses were used for analysis. Elevated odds ratio (OR) values were obtained from a linear model analysis, showing statistically significant predictors of risky sexual behaviour among young people who have experienced coerced sex (OR=2.2), substance use (OR=1.8), having had sex before the age of 15 (OR=1.9), being older (OR=1.1) and lack of sexual self-efficacy (OR=1.6). Therefore risk reduction strategies aimed at addressing these potential problems should target young people before they enter adolescence and should develop gender-specific strategies. (*Afr J Reprod Health* 2013; 17[3]: 169-181).

Résumé

L'objectif de cette étude est de combler cette lacune-là qui existe dans la recherche tout en examinant les facteurs qui sont susceptibles de prédire la pratique de comportements sexuels à risque chez les jeunes gens du Botswana à l'ère du VIH / SIDA. Les données utilisées dans cette étude ont été obtenues à partir d'un échantillon national représentatif de 5810 jeunes âgés de 15 à 29 ans qui avaient rempli un questionnaire individuel du Botswana AIDS Impact Survey III 2008. Des analyses de régression à la fois descriptive et multiples ont été utilisées pour l'analyse. Les rapports de valeurs de cotes élevé (OR) ont été obtenus à partir d'une analyse du modèle linéaire, montrant des indices statistiquement significatifs de comportements sexuels à risque chez les jeunes qui ont eu des relations sexuelles sous la contrainte (OR = 2,2), la consommation de drogue (OR = 1,8), après avoir eu des relations sexuelles avant l'âge de 15 ans (OR = 1,9), étant plus âgés (OR = 1,1) et le manque d'auto-efficacité sexuelle (OR = 1,6). Par conséquent, les stratégies de réduction de risque destinées à résoudre ces problèmes potentiels devraient cibler les jeunes gens avant qu'ils n'entrent dans l'adolescence et devrait élaborer des stratégies propres à chaque sexe. (*Afr J Reprod Health* 2013; 17[3]: 169-181).

Keywords: Risky sexual behaviour, young people, HIV/AIDS, Botswana

Introduction

Sub-Saharan Africa remains the region that is hardest hit by the HIV/AIDS epidemic with the highest rates in Southern Africa¹. Of the estimated 33.3 million people living with HIV/AIDS worldwide in 2010, almost 68% were in sub-Saharan Africa². Youth in sub-Saharan Africa continue to be one of the populations at greatest risk for HIV infection, particularly young women^{3,4}. Despite intensive and aggressive HIV/AIDS prevention campaigns, Botswana

continues to be ravaged by the HIV/AIDS epidemic. According to the Botswana AIDS Impact Survey III (BAIS III), 17.6 per cent of the population aged 18 months and above was HIV infected in 2008 compared to 17.1% in 2004. HIV and AIDS have a strong gender dimension. According to the 2008 Botswana AIDS Impact Survey III, the HIV prevalence rate for females was 20.4% compared to 14.2% males. The HIV incidence rate also shows gender disparity where

African Journal of Reproductive Health September 2013; 17(3): 169

more females compared to males showed higher incidence.

Although there are various ways through which HIV infection can be transmitted, the major route of HIV transmission in sub-Saharan Africa is heterosexual sexual intercourse. Thus sexual behaviour of individuals determines the rate at which HIV infection is likely to spread in an African population. Therefore, in order to effectively prevent further HIV infections, the sexual behaviour, especially that of young people, is particularly paramount. For purposes of this study, young people are defined as those age 15-29 years. It has been noted that young people are a special group with special needs⁵. Young people frequently lack information and access to services that may in turn lead to increased risky sexual behaviours⁶. Some of the sexual risks involve unprotected sexual intercourse, early sexual debut, having multiple concurrent partners, unintended pregnancies, unsafe induced abortion and HIV infection^{4, 7-10}. Early childbearing has been linked to reduced educational opportunities and lower levels of family income¹¹⁻¹⁵. Some of the documented high risky sexual behaviour related to HIV among sexually active population includes early age of sexual intercourse, non-use of condom and multiple sexual partners^{4, 16}.

While there is a wealth of research on risk behaviours among young people in the world, very few studies, if any, have been conducted in Botswana. In addition, "recent reviews of research on sexual behaviour and adolescent sexuality have cautioned that these studies are limited and that their findings cannot be generalised, because they are based on very small samples or convenience samples, made up mainly of males. Furthermore, the focus of many studies has been primarily on the extent of sexual behaviour among youth rather than on the correlates of that behaviour¹⁷. In addition, there are no studies in Botswana that use risk and protective models simultaneously to investigate factors contributing to health-compromising behaviours, especially those of young people¹⁸⁻²⁰.

The focus on young people is predicated on the understanding that they engage in more frequent sex and have a long period of sexual activity before them. Thus, the future of HIV/AIDS

prevalence depends upon the direction that prevention programmes take with respect to young people²¹. Although the proportion of young people under the age of 15 years has been declining in Botswana, from 47.5% of the total population in 1971 to 36.6% in 2001, this sub-population constitutes a substantial proportion that deserves investigation. First sex at an early age involves high risk of transmission of HIV and other STDs. Age at first sexual intercourse was estimated at 17.5 years in 1988²². Girls' first sexual experience is more likely to be with an older partner who has had more time to be exposed to HIV or other STDs. Another fact is that women's lack of equal access to legal, social and economic resources compared to older male counterparts makes them more vulnerable to sexual exploitation²³. The key to controlling HIV/AIDS lies in promoting safer sex behaviour among young people.

Various studies²⁴ showed that young people do not always practice safe sex in general for a variety of reasons. The reasons are related to pressure to engage in early and unprotected intercourse, coercion, pressure to have a child, lack of access to user-friendly reproductive health services, negative perceptions about condoms, low perceptions about personal risk, and low perceived self-efficacy in preventive behaviour. Other studies have also identified that young people with emotional or behavioural problems are more likely to engage in risky sexual behaviour^{25, 26}. Young people reporting using substances also tend to report engaging in risky sexual behaviour²⁷⁻²⁹.

Other studies have also identified factors that ameliorate engagement in risky sexual behaviours. For instance, young people who report having peers who engage in fewer risky sexual behaviours also report engaging in fewer risky sexual behaviours themselves^{19, 30}. Most studies from elsewhere have assessed these factors in isolation and have not attempted to link them in a theory-driven manner²⁰. The first goal of this study is to investigate the relationship between risk factors and risky sexual behaviour. The second goal is to determine whether protective factors moderate the relationships between these risk factors and young people's practicing unsafe sex.

Currently, the main public health concern in Africa regarding young people's sexuality is

HIV/AIDS. Although the prevalence of HIV/AIDS has been increasing in most of the African countries in the past, recently there is evidence to suggest a down turn in the HIV prevalence among young people. For instance, the HIV prevalence among the 15-19 year-olds in Botswana declined from 22.8% in 2003 to 10.0% in 2011 and that of the 20-24 year-olds declined from 38.6% to 19.0% in the same period³¹. In Botswana, sensitization and information programmes on HIV/AIDS have been implemented along with efforts to promote the use of condom. Although condom use was reported to be high among young people, other programme deliverables have yet to bear appreciable fruits. The increased level of awareness about HIV/AIDS and prevention methods do not seem to have translated into the adoption of protective sexual behaviours, especially among adolescents³².

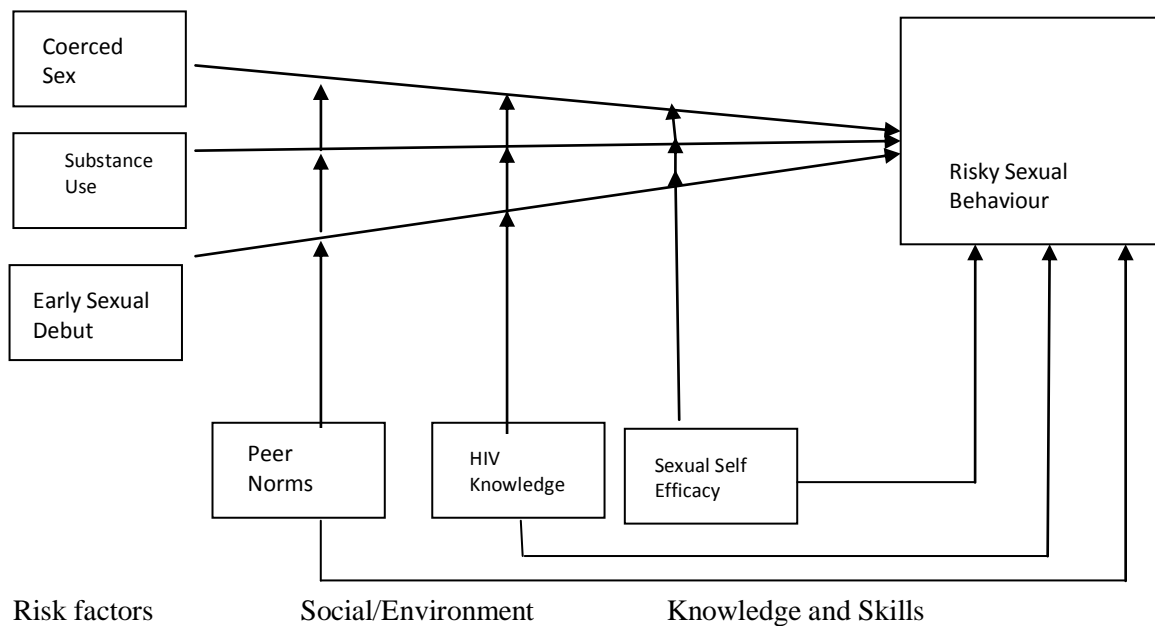
Few studies have used risk and protective models to explore factors contributing to health-

compromising behaviours in young people²⁰. Previous studies for example²⁰ have identified possible risk and protective factors for young people engaging in high-risk sexual behaviour and have assessed these factors in isolation and have not attempted to link them in theory-driven manner. This study builds on the existing literature by applying a theoretical model that includes both risk and protective factors in predicting risky sexual behaviour among young people in Botswana. The objective of this study is to investigate the moderating effect of protective factors on risk factors in influencing the risky sexual behaviour among young people in Botswana.

Theoretical Framework

This study is based on a modified version of the theoretical framework discussed below.

Figure 1: Risk and protective model for predicting risky sexual behaviour



Source: Bachanas et al., 2002

Figure 1 shows the possible risk and protective factors for people engaging in risky sexual behaviour, where risk and protective factors are linked in a theory-driven manner. The analytical framework includes both risk and protective

factors in predicting people’s risky sexual behaviour. Peer norms form the social environment whilst HIV knowledge and sexual self-efficacy constitutes knowledge and skills. The conceptual framework or model also postulates

that the influence of risk factors on risky sexual behaviour can be mediated by protective factors.

Using this conceptual framework, it is hypothesized that young people who reported having had coerced sexual intercourse, those who reported taking alcohol or drugs for recreation (substance use), and those who reported having had their first sexual intercourse before age 15 will report engaging in more risky sexual behaviour. It is also hypothesized that young people who reported the above-stated risk factors and have higher levels of HIV knowledge, will have more confidence in their ability to practice safer sex (i.e. sexual self-efficacy), and believe that their peers practice safer sex (i.e. peer norms) will report engaging in fewer risky sexual behaviour²⁰. Thus it is predicted that protective factors will moderate the relationship between the risk factors and risky sexual behaviour.

Methods

Data

The current study uses secondary data derived from the Botswana AIDS Impact Survey III, which is a nationally representative population-based survey whose main objective was to provide up to date information of the HIV and AIDS pandemic in Botswana with respect to its prevalence, incidence as well as behavioural patterns and knowledge, care and support, attitude toward PLWHA, as well as socio-economic, demographic and household and living conditions associated with the disease (relevance with analysis). In this survey, unlike the previous ones, blood samples were collected from willing respondents for the determination of HIV prevalence and incidence. Using a combination of stratified and two stage cluster sampling design, 8275 households was drawn systematically from a listing of households within selected EAs prepared at the beginning of fieldwork. The response rate was 82%³³. The 2008 Botswana Impact Survey results showed that HIV prevalence was estimated at 17.6% of the population aged 18 months and above, compared to a corresponding figure of 17.1% for the 2004 BAIS. HIV prevalence among

females was 25.2% compared to 17.2% males in 2008³³.

Sample

For the purpose of the current study, people aged between 15 and 29 years, classified as young people, were selected for analysis. Only those who were young people and had fully completed the questionnaire were selected into the sample. For some selected questions such as those requiring youth who had sexual experience, we introduced additional selection criteria. For instance, a question on age at first sex required that only those who have had sexual experience be included for analysis. The number of eligible 15-29 years old participants who had responded to the questions on sexuality is 3,661. Out of these 1,983 reported to having sexual experience. Furthermore, to explore the effect of marital status on risky behaviour, very few young people belonged to any of the following: divorced, widowed or separated hence these categories were omitted, allowing for only 1977 participants to be used for analysis

Measurement of variables

There were several questions in the 2008 Botswana AIDS Impact Survey III (BAIS III) Individual Questionnaire that were used to investigate the current research problem in this study.

Composite Outcome Variable

Risky Sexual Behaviour: Participants were asked to state the current number of their sexual partners. They were also asked if in the past 12 months they had used a condom when having sexual intercourse or had intergenerational sex (partner who is 10 years older or younger). The variables were coded as follows: current number of sexual partners (0 or 1 = 0; 2 or more partners = 1), and in the past 12 months was a condom used when having sexual intercourse coded as (0 = yes; 1 = no never/no sometimes) and engages in intergenerational sex (1=yes; 0=No). Two of the response variables, non-use of condom and

intergenerational sex had a strong association with each other so they were grouped together in the factor analysis with factor loadings of 0.86 respectively, while number of sexual partners formed the second component. A decision was taken to create a score by summing the responses from each variable to constitute a single response variable. This resulted in a variable that measures risky behaviour with categories 0-3, where 0 is category with no risky behaviour, 1 with one risky behaviour, 2 with two risky behaviours and 3 with three risky behaviours. The category with three risky behaviours had few observations hence was collapsed and merged with category with two risky behaviours. The categories of the response variable henceforth are ordinal, allowing for interpretation similar to when a variable is continuous.

Independent Variables

Previous studies have identified several factors associated with young people engaging in risky sexual behaviour. The variables listed below are expected to increase the likelihood of engaging in risky sexual behaviour by young people.

- i. *Coerced sex.* Respondents were asked if they have ever had sex without their consent. If the response was “yes”, then the variable was coded as 1 and 0 if they said no.
- ii. *Substance use.* This variable was measured by a 2-item scale that asked survey participants whether or not they have ever consciously taken an alcoholic drink or have ever taken drugs for recreation other than alcohol (e.g. mandrax, marijuana or glue). Those participants who responded “yes” to at least one substance use were coded as 1 and those who responded “no” to all were coded as 0.
- iii. *Having sex before age 15.* Participants who reported ever having sex were asked the age at which they first had sex. Participants who reported having sex before age 15 were coded 1 and those who reported having sex after age 15 were coded 0. The mean age at which the youth in Botswana start penetrative sex is around 20 years.

- iv. *HIV knowledge.* HIV-related knowledge was measured by 7-item scale assessing young people’s knowledge about HIV/AIDS in “yes/no/don’t know” questions. Those who did not provide the right answer or did not know were classified together and assigned a value of 0 or 1 if they provided the correct answer. The following questions were asked to participants: it is possible for a healthy-looking person to have AIDS; whether people can reduce their chances of getting HIV and AIDS by using a condom correctly every time they have sex; whether a person can get infected with HIV through mosquito bites; whether people can reduce their chances of getting HIV and AIDS by having only one uninfected sex partner who has no other partners; whether a person can get infected with HIV and AIDS by sharing a meal with a person who has HIV and AIDS; whether a person can get HIV and AIDS because of witchcraft; and finally whether HIV and AIDS can be transmitted from mother to a child. A composite with a range of 0 for one who had no HIV knowledge to 7 for someone who got all questions correct score was obtained by summing the binary scores. A person who scored at least 6 out of 7 points was considered to have a good understanding on HIV, while a person scoring less than 6 points were considered to have poor understanding on HIV.
- v. *Sexual self-efficacy.* This variable is measured by 2-item scale assessing young people’s confidence in their ability to practice safer sex. Participants were asked if they believed that they could persuade a sex partner to use a condom and if they could persuade a sex partner not to have sex if they were not interested. Each of the items was coded as 1 if they believed that they could persuade their sex partners all the time to use a condom or not to have sex if they were not interested and 0 if they sometimes did persuade or did not believe they could persuade their partners. An aggregative score 0-2 was created by summing the

outcomes for the two items and then coded as ≤ 1 if sum was 1 and 0 if sum was 2.

- vi. *Perceived peer norms.* Peer norms were measured by a 2-item scale assessing young people's perceptions of their peers' involvement in risky practices such as always using a condom and abstaining from sex to avoid contracting HIV, STI and pregnancy. Each variable was coded 1 if they thought that their peers who were sexually active always used a condom with new sex partners or they thought that avoiding sex to protect against HIV, STI and pregnancy was acceptable among their peers and 0 if they thought otherwise. An aggregate score 0-2 was created by summing up the outcomes of two items and then coded as 1 if sum was ≤ 1 and 0 if sum was 2

Statistical analysis

The data was analysed using descriptive statistics and logit link. Descriptive statistics were used to examine the relationship between risky sexual behaviour and gender in order to investigate sex differentials in risky sexual behaviour. The logit link method is explained in detail below.

Logit link

In analyzing discrete response variable Y , against a vector \mathbf{X} of covariates in an endeavour to establish a linear relationship, some transformations may be necessary. There exist several link-function transformations the most widely used being the logit. This links the probability of occurrence/non-occurrence of an event with a linear combination of the explanatory variables and their corresponding parameter estimators. Without loss of generality, let the response variable Y takes the values $\{0, 1\}$. Defining probability that Y takes the value 1 as, $\pi(\mathbf{x})$ then the function:

$$\log\left(\frac{\pi(\mathbf{x})}{1-\pi(\mathbf{x})}\right) = \mathbf{X}\boldsymbol{\beta},$$

is called the logit link function, which is the logarithm of odds of occurrence of the event, where $\eta = \mathbf{X}\boldsymbol{\beta}$, is the expectation. We note that

the distribution for $P(Y=1)$ is a logistic distribution.

Generalization to k -categories is possible when the response variable's values take any of the k categories $\{t_1, t_2, t_3, \dots, t_k\}$. When the categories are ordered, the multinomial regression referred to as cumulative proportional odds model uses the logit link function. The logit transformation provides a comparison amongst the categories of the covariate which are proportional to odds ratio. For illustration let the covariate X be a binary variable, say, gender (male/female). Let $x=1$ if male and define $\pi(t_j, \mathbf{x}_i)$ as the probability of realizing event at or before t_j for a male.

$$\pi(t_j, \mathbf{x}_i) = P(Y_i \leq t_j) = \frac{\exp(\beta_{0j} + \mathbf{x}\boldsymbol{\beta})}{1 + \exp(\beta_{0j} + \mathbf{x}\boldsymbol{\beta})} = F(\beta_{0j} + \mathbf{x}\boldsymbol{\beta}),$$

where $F(\cdot)$ is the distribution of the linear function.

The baseline parameters β_{0j} can be viewed as cut off points or thresholds for the categories. Think of a continuous variable T which has been subdivided into k -categories, each category demarcated by β_{0j} ($j=1,2,\dots,k-1$). Hence $Y = t_j$
 $\Leftrightarrow \beta_{0j-1} < T < \beta_{0j}$ where $-\infty = \beta_{00} < \beta_{01} < \dots < \beta_{0k} = \infty$, thus we need to estimate only the $\beta_{01}, \beta_{02}, \dots, \beta_{0k-1}$ parameters.

For the logit link method, three models are presented. Model 1 is a gross effect model where only risky factors were entered simultaneously as independent variables with risky sexual behaviour as a dependent variable. Model 2 is a net effect model where risky factors plus protective factors were entered together as independent variables to assess the mitigating effect of protective factors on risky factors. Model 3 is a net effect model including all the variables used in Model 2 plus the socio-demographic variables treated as control variables. In this study, data were analysed using (IBM SPSS) version 19.

Results

Sample characteristics

Table 1 presents information on the sample characteristics. Out of a sample of 5814 participants, 53.5% were females. Both males and females were equally distributed between different age groups. Most of the respondents (over 80%)

had attained at least secondary education. Over half of the respondents were Christians while young people with no religion constituted about 28%.

Slightly more than a third of the respondents resided in rural areas compared to about two-thirds living in urban areas. Females were more likely to

be married (or living with someone) than were men (31% vs 17%). Notably, almost all respondents were unemployed. Approximately 34% of the 5810 young people reported that they have ever had sex and this is the group of young people used in the analysis that follows.

Table 1: Percentage distribution of young people in Botswana, by selected characteristics, according to sex, 2008 Botswana AIDS Impact Survey III

Characteristic	Male	Female	Total
Age			
15-19	34.1	31.4	1910
20-24	32.7	34.1	1956
25-29	33.1	34.5	1978
Ever had sex			
Yes	55.5	52.3	1983
No	45.5	47.7	1678
Educational level			
Primary or less	17.0	12.2	839
Secondary	67.2	72.6	4080
Post-Secondary	15.9	15.2	902
Religion			
Christian	58.5	77.0	3934
Other religions	5.4	2.6	223
No religion	36.1	20.4	1592
Residence			
Cities/towns	30.9	29.0	1747
Urban Villages	32.0	37.3	2034
Rural areas	37.1	33.7	2063
Marital status			
Never married	82.2	68.6	4356
Married	2.1	4.9	212
Living together	15.4	26.0	1223
Separated	0.2	0.3	13
Divorced	0.0	0.1	5
Widowed	0.0	0.1	5
Employment status			
Employed	0.4	0.5	25
Unemployed	99.6	99.5	5782
Total	2699	3111	5810

Prevalence of risky sexual behaviour

Table 2 presents the percentage of sexually active young people who reported various risky sexual behaviours, comprising of 1,983 young people. The mean age at first sexual intercourse was 18.4 years and was slightly higher for females than males (18.7 years compared to 18.1 years).

Approximately 10% of young people reported not having used a condom at their last sexual

intercourse, with a higher percentage of females reporting condom non-use than males (15% compared with 9%). About 9% of young people reported having had sexual intercourse while under the influence of alcohol, with a higher percentage of males reporting having had sex while under the influence of alcohol than females (12% compared with 9%). Roughly 21% of young people reported having multiple sexual relationships, with a higher percentage of males

reporting having multiple sexual relationships than females (27% compared with 13%). About 13% of young people reported that they had a sexual partner who was 10 years older or younger, with a higher percentage of females reporting cross-generational sex than males (17% compared with 10%). Approximately 5% of young people stated

that they had sex without their consent, with a higher percentage of females reporting coerced sex than males (8% compared with 3%). About 5% of young people reported that they had sexual intercourse before reaching age 15, with a higher percentage of males reporting early sexual debut than females (8% compared with 1%).

Table 2: Percentage of Young People Who Reported Ever Having Sexual Intercourse Reporting Selected Sexual Behaviours.

Risky Sexual Behaviour	Male	Female	Total
<i>Mean age at first sexual intercourse (years)</i>	18.1 (*S.D.= 2.7)	18.7 (*S.D.= 2.3)	18.4 (*S.D.= 2.6)
<i>Was condom used at last sex?</i>			
Yes	91.3	84.7	1534
No	8.7	15.3	198
	$\chi^2 = 17.8$	$df = 1$	$p=0.000$
<i>Were you or your partner drunk last time you had sex?</i>			
Yes	12.0	9.2	187
No	88.8	90.8	1541
	$\chi^2 = 3.5$	$df = 1$	$p=0.061$
<i>Current number of sexual partners</i>			
0 or 1	72.9	87.3	1556
≥2	27.1	12.7	421
	$\chi^2 = 58.9$	$df = 1$	$p=0.000$
<i>Ever had sex partner who was 10 years older or younger?</i>			
Yes	10.3	17.1	259
No	89.7	82.9	1722
	$\chi^2 = 19.2$	$df = 1$	$p=0.000$
<i>Have you ever had sex without your consent?</i>			
Yes	3.2	7.9	101
No	96.8	92.1	1869
	$\chi^2 = 21.3$	$df = 1$	$p=0.000$
<i>Had sex before age 15?</i>			
<15	7.8	1.4	103
=>15	92.2	98.6	1874
	$\chi^2 = 39.8$	$df = 1$	$p=0.000$
Total			1983

NB *SD stands for standard deviation

Predictors of young people’s practice of unsafe sexual behaviours: Testing the Three Models

The role of risk factors in increasing participation in risky sexual behaviour

Table 3 presents the results showing predictors of young people’s participation in risky sexual

behaviour. The analysis is based on young people who reported ever having sexual intercourse. One of the statistically significant predictors of engaging in risky sexual behaviour is the experience of sexual coercion. Sexually active young people who reported having ever been forced into sexual intercourse were 134% or 2.34

times significantly more likely to have engaged in risky sexual behaviour compared to those who have never experienced coerced sex. This relationship remains statistically significant with the adjusted odds ratio of around 2 despite the introduction of protective factors and other control variables which were expected to moderate the effects of risk factors.

Another statistically significant predictor of engagement in sexual risk behaviours is substance use. Young people who had ever used either alcohol or drugs or both were about 2 times significantly more likely to have practiced unsafe sex compared to those who have never used alcohol or drugs. This relationship remains statistically significant despite the introduction of protective factors and control variables which were expected to moderate the effects of risk factors.

Young people who experienced sexual intercourse before reaching age 15 were 2 times significantly more likely to report having engaged in risky sexual behaviour compared to those who started their sexual debut at or after age 15. This relationship also remains statistically significant even after the introduction of protective factors and control variables which were expected to moderate the effects of risk factors

The role of protective factors in moderating risky sexual behaviour

All the protective factors appear to decrease the

chances of engaging in risky sexual behaviour as expected. However, young people who reported higher levels of perceived self-efficacy (i.e. they could persuade their sexual partners to use condoms and not to have sex if not interested) showed that they were 89% significantly less likely to have engaged in risky sexual behaviour compared to those who had low perceived self-efficacy.

Young people who held perceptions that their peers always use condoms and abstained from sex to avoid contracting HIV, STI and getting pregnant (peer norms) were 25% less likely to have engaged in risky sexual behaviour compared to their counterparts who believed otherwise.

Young people who were less knowledgeable about HIV transmission and prevention methods were 3% less likely to engage in risky sexual behaviour compared to those who had less knowledge. However, this relationship was not statistically significant.

The role of control factors in risky sexual behaviour

The gender of the respondent was not a statistically significant predictor of the likelihood to engage in risky sexual behaviour among young people. Young females were more likely to state that they had indulged in two or more risky sexual behaviours compared to their male counterparts (see Table 3).

Table 3: Predictors of risky sexual behaviour among young people, 2008 Botswana AIDS Impact Survey

		Model I		Model II		Model III	
		Odds ratio	95% C.I.	Odds ratio	95% C.I.	Odd ratio	95% C.I.
Group	Factor						
	Coerced sex						
Risky Factors	Yes	2.24***	1.44, 3.51	2.11**	1.32, 3.39	1.97**	1.21, 3.19
	No (ref)	1		1			
	Substance use						
	None (Ref)	1		1			
	At least one type	1.96***	1.47, 2.63	1.77***	1.31, 2.39	1.86***	1.37, 2.54
	Age at first sex						
Protective Factors	Under age 15	1.79***	1.17, 2.73	1.87**	1.19, 2.92	1.99**	1.26, 3.16
	Age 15 & above (Ref)			1	-	1	-
Protective Factors	HIV knowledge						
	≤ 5 (Poor)			0.94	0.75, 1.17	0.91	0.72, 1.15
	>5 (Good) (Ref)			1	-	1	-
	Sexual self-efficacy						

Individual Factors	Sometimes or never Persuade all time (Ref)	1.55*** 1	1.27, 1.89 -	1.45*** 1	1.18, 1.77 -
	Peer norms				
	Never or sometimes Always (Ref)	1.12 1	0.84, 1.50 -	1.08 1	0.80, 1.45 -
	Gender				
	Female			1.02	0.82, 1.26
	Male			1	-
	Marital Status				
	Living together			1.19	0.92, 1.54
	Married			2.73**	1.40, 5.31
	Single			1	-
	Education Level				
	None & Primary (Ref)			1	-
	Secondary			0.76	0.52, 1.11
	Post-secondary			0.64*	0.42, 0.98
	Place of Residence				
	Rural			0.84	0.65, 1.09
	Semi-Urban			0.86	0.68, 1.09
Urban			1	-	
Age			1.09***	1.05, 1.12	

*p<0.05, **p<0.01 & ***p<0.001

Note: **Model I** – Includes coerced sex, substance use and age at sex as independent variables only

Model II – Includes variables in Model I plus HIV knowledge, sexual self-efficacy & perceived peer norms

Model III – Includes all variables in Model II plus sex, education, residence, and age of respondent
C.I. represents confidence interval

At this age only 2.3% of the participants had entered into matrimonial relationships of marriage, divorce, widowed or separation. Data reveals that in comparison to never married group, while controlling for other characteristics, married respondents are 173% more inclined to indulge in risky behaviours and this is statistically significant at a probability of 0.003. Though the odds are higher for those living with partners outside marriage compared to those who are single, there is no significant contribution towards risky behaviour for this category.

In addition, young people with post-secondary education were 82% significantly less likely to report practicing risky sexual behaviour compared to those who had no education. Although not statistically significant, young people who had secondary education were significantly less likely to report having engaged in risky sexual behaviour compared to their counterparts with no education.

As regards the influence of place of residence, residents of rural areas were less likely to report having indulged in risky sexual behaviour compared to residents of cities/towns. Residents of urban villages were also less likely to report

indulging in sexual risk behaviour than their counterparts in cities/towns. All these relationships were not statistically significant.

Older young people compared to young ones were more likely to indulge in risky behaviour with a year increase in age increasing the chance by 9% and this effect is statistically significant at a probability of 0.001.

Discussion

In order to reverse the tide of the HIV and AIDS epidemic, it is imperative to study the sexual behaviour of young people who constitute a substantial section of the entire population. This study set out to identify the predictors of practicing risky sexual behaviour among young people in Botswana. Significant proportions of young people in the selected sample practiced some risky sexual behaviour that may sustain the high prevalence and incidence of HIV in the country. The results from this study, like other studies elsewhere^{20, 34} have shown that young people engage in risky sexual behaviours. Bivariate results showed that overall the majority

of young males reported ever having sex, having had sexual intercourse while under the influence of alcohol, having multiple concurrent sexual relationships, and having had sexual intercourse before reaching age 15. Young females predominantly reported not having used condoms at their last sexual intercourse, having experienced intergenerational sex, and having experienced sexual coercion. All these behaviours predispose these young people to risky sexual experiences such as contracting sexually transmitted infections including HIV and having unwanted and unplanned pregnancies which may ultimately lead to unsafely induced abortions.

Model 1 showed that all the three sexual risk factors (namely, sexual coercion, substance use and early sexual debut) were statistically significant predictors of practicing risky sexual behaviour by young people. Model II showed that there was no support for protective factors (HIV knowledge, sexual self-efficacy and peer norms) moderating the relationship between risk factors and risky sexual behaviour in this study. The coefficients of all the sexual risk factors were not substantially reduced to reflect that protective factors were moderating the relationship between risk factors and risky sexual behaviour. Instead they remained fairly stable, if not increased in some cases. Sexual self-efficacy was found to be a statistically significant factor influencing young people's practicing risky sexual behaviours in that young people who felt they could persuade a sex partner to use a condom and refuse to have sex if not interested were significantly more likely to report to have engaged in risky sexual behaviours. Two protective factors that did not have any statistically significant relationship with risky sexual behaviour were HIV knowledge and perceived peer norms.

Young people in Botswana start sexual activity at a fairly young age. In this sample, the average age at first sexual intercourse was 18.4 years, 18.1 years for males and 18.7 years for females. Previous studies have found the age at first sexual intercourse to be 17.5 years in 1988²² -- possibly indicating a slight increase in average age of first sexual intercourse-- and early sexual debut put young people at high risk of contracting HIV and other sexually transmitted infections as they are

more likely to have more sexual encounters and more lifetime partners and are less likely to practice safer sex than young people who delay intercourse.

Consistent with previous studies^{26, 27}, this study found that substance use among young people was a statistically significant predictor of engaging in risky sexual practice. Under the influence of alcohol or drugs, young people are less likely to delay sexual intercourse or use protection during sex¹⁹. It is clear from study results that young people who use substances were also more likely to practice risky sexual behaviour that put them at greater risk for HIV and STIs.

Although other studies have reported that peer norms predict young people's indulgence in risky sexual practices^{19-20,30}, this study did not find any support for this assertion. Perceived peer norms were not related to risky sexual behaviour. It is possible that young people were more influenced by their families rather than by their peers. Since no variable is available in the data to measure the influence of family on sexual behaviour of young people, we could only speculate what explains this finding. There is no direct measure of social norms from the current data set used in the analysis of this study.

The study results have various policy implications. One such recommendation is that HIV and STI prevention strategies should be targeted to those younger than 15 and young adolescents because of early sexual debut. Failure to reach young people before they start sexual activity may not yield the desired results of reducing HIV infection rates. HIV prevention strategies need to be strengthened to ensure that young people delay their age at which they start sexual encounters.

The National Strategic Framework for HIV and AIDS for Botswana has identified five key drivers of AIDS epidemic which include gender violence. Because women generally tend to possess little power over their own bodies, they are put at risk of HIV infection by a combination of the social acceptance of male partners having more than one sexual relationship, inability to negotiate condom use and sexual exploitation, especially the younger girls. Thus, socially as well as biologically, they are more susceptible to HIV infection. Empirical

evidence in the region suggests that gender violence and sexual abuse are on the rise and these could be associated with increased risk of HIV infection. This study provides evidence to support the assertion that coerced sex increase the likelihood of practicing risky sexual behaviour. Therefore HIV and AIDS interventions programmes should be comprehensive enough to include aspects addressing sexual violence as a key determinant of infection.

This study showed that young people who perceived themselves as lacking the skills to insist on condom use and refuse sex when not interested (self-efficacy) were significantly more likely to practice risky sexual behaviour. Therefore life skills programmes targeting young people should be strengthened to ensure that young people are empowered to refuse to engage in sexual activities that may endanger their lives, such as self-efficacy.

Conclusion

This study has found that the key predictors of risky sexual behaviour among young people in Botswana were having had sexual intercourse before reaching age 15, having experienced sexual coercion, having experienced substance use/abuse, being older, lacking sexual self-efficacy and being male. Other factors that were thought to be potential predictors of risky sexual behaviour (HIV knowledge levels and peer norms) were not supported by the data.

Limitations of the Study

The major limitation of this study is that secondary data were used, thereby limiting the researchers to variables collected by the survey. This was particularly notable in the case of protective factors. We did not have information on the connectedness of youth to church, school, families, sports, or communities. Another limitation is that the information collected was self-reported, which was subject to reporting errors and biases. The third limitation was that since the questions ask about sexual activity which young people might not be comfortable talking about this discomfort could lead to underreporting of levels of sexual

activity and engagement in risky sexual behaviour. The response rate for the survey was 82% and could possibly have had a greater refusal by higher risk individuals. Unfortunately we do not have the non-response rate for the youth. Finally, this study was based on cross-sectional data, implying that the direction of relationships could not be determined. The interpretation of the results, therefore, limits it to associations between variables rather than causal relationships.

Acknowledgements

The authors wish to thank Central Statistics Office in the Ministry of Finance and Development Planning for granting them permission to use the 2008 Botswana AIDS Impact Survey data set.

Contribution of Authors

Professor Gobopamang Letamo conceived and drafted the first manuscript and invited Dr. Lucky L. Mokgathe to co-author the article. Dr. Mokgathe wrote statistical analysis section of the article, analysed and interpreted the data used in the manuscript. Both of the authors have revised the reviewed manuscript and reworked on their respective sections of the article (Professor Letamo on the substantive sections while Dr. Mokgathe worked on the statistical aspects of the article).

References

1. Obidoa CA, M'Lan CE, and Schensul SL. Factors associated with HIV/AIDS sexual risk among young women aged 15-24 years in Nigeria. *Journal of Public Health in Africa* 2012; 3:e15: doi:10.4081/jphia.2012.e15.
2. UNAIDS. *Global Report: UNAIDS Report on the Global AIDS Epidemic, 2010.*
3. Kirby DB, Laris BA, and Rolleri LA. Sex and HIV education: their impact on sexual behaviour of young people throughout the world. *Journal of Adolescent Health* 2007; 40(3): 206-217.
4. Pettifor AE, van der Straten A, Dunbar MS, Shiboski SC, and Padian NS. Early age at first sex: a risk factor for HIV infection among women in Zimbabwe. *AIDS* 2004; 18(10): 1435-1442.
5. Hulton LA, Cullen R, and Khalokho W. Perceptions of the Risks of Sexual Activity and Their Consequences among Ugandan Adolescents. *Studies in Family Planning* 2000; 31(1): 35-46.

6. McCauley AP, and Salter C. Meeting the needs of young adults. *Population reports 1995; Series J, No 41.* Baltimore, Johns Hopkins University School of Public Health, Population Information Program.
7. O'Donnell BL, O'Donnell CR, and Stueve A. Early sexual initiation and subsequent sex-related risks among urban minority youth: the reach for health study. *Family Planning Perspectives 2001; 33(6): 268-275.*
8. Cerwonka ER, Isbell TR, and Hansen CE. Psychosocial factors as predictors of unsafe sexual practices among young adults. *AIDS Education & Prevention 2000; 2(2): 141-153.*
9. Gilborn L.Z. (2002). *The effects of HIV infection and AIDS on children in Africa.* West Journal of Medicine: 176(1): 12-14.
10. Cote AM, Sobela F, Dzokoto A, Nzambi K, Asamoah-Adu C, Labbe AC, Masse B, Mensah J, Frost E, and Pepin J. Transactional sex is the driving force in the dynamics of HIV in Accra, Ghana. *AIDS 2004; 18(6): 917-925.*
11. Jones EF and Forrester JD. *Teenage Pregnancy in Industrialized Countries.* New Haven: Yale University Press, 1986.
12. Senderowitz J and Paxman JM. Adolescent fertility: Worldwide concerns. *Population Bulletin 1985; 40(2): 3-49.*
13. Voydanoff P and Donnelly BW. *Adolescent sexuality and pregnancy, Newbury Park, CA: Sage Publications, 1990.*
14. Wulf D, Singh S. Sexual activity, union and childbearing among adolescent women in the Americas. *International Family Planning Perspectives 1991; 17:137-144.*
15. Yinger N, de Sherbinin A, Ochoa L, et al. *Adolescent Sexual Activity and Childbearing in Latin America and the Caribbean: Risks & Consequences.* Washington, DC: Population Reference Bureau, 1992.
16. Slaymaker E and Zaba B. Measurement of condom use as a risk factor for HIV infection. *Reproductive Health Matters 2003; 11: 174-184.*
17. Abraham L and Kumar KA. Sexual experiences and their correlates among college students in Mumbai city, India. *International Family Planning Perspectives 1999; 25(3): 139-146.*
18. Irwin CE Jr and Millstein SG. Biopsychosocial correlates of risk-taking behaviours during adolescence. *Journal of Adolescent Health Care 1986; 7: 825-965.*
19. Millstein SG and Moscicki A. Sexually transmitted disease in female adolescents: Effects of psychosocial factors and high-risk behaviours. *Journal of Adolescent Health 1995; 17: 83-90.*
20. Bachanas PJ, Morris MK, Lewis-Gess JK, Sarett-Cuasay EJ, Sirl K, Ries JK, and Sawyer MK. Predictors of Risky Sexual Behaviour in African American Adolescent Girls: Implications for Prevention Interventions. *Journal of Pediatric Psychology 2002; 27(6): 519-530.*
21. Rwenge M. Sexual Risk Behaviours Among Young People in Bamenda, Cameroon. *International Family Planning Perspectives 2000; 26(3): 118-123.*
22. Letamo G. Contributions of the proximate determinants to fertility change in Botswana. *Journal of Biosocial Sciences 1996; 28:325-338.*
23. UNAIDS. *Innovative Approaches to HIV Prevention: Selected Case Studies,* Geneva, Switzerland, 2000.
24. Bankole A, Singh S, Woog V, and Wulf D. *Risk and Protection: Youth and HIV/AIDS in Sub-Saharan Africa:* New York. The Alan Guttmacher Institute, 2004.
25. Keller S, Bartlett J, Schleifer S, Johnson R, Pinner E, and Delancey B. HIV-relevant sexual behaviour among a healthy inner-city heterosexual adolescent population in an endemic area of HIV. *Journal of Adolescent Health 1991; 12: 44-48.*
26. Orr DP, Beiter M, and Ingersol G. Premature sexual activity as an indicator of psychosocial risk. *Pediatrics 1991; 87: 141-147.*
27. Fortenberry JD. Adolescent substance use and sexually transmitted diseases risk: A review. *Journal of Adolescent Health 1995; 16: 304-308.*
28. Millstein SG, Irwin CE Jr, Adler NE, Cohn LD, Kegeles SM, and Dolcini MM. Health-risk behaviours and health concerns among young adolescents, *Pediatrics 1992; 89: 422-428.*
29. Smith CA. Factors associated with early sexual activity among urban adolescents. *Social Work, 1997; 42: 334-346.*
30. Black MM, Ricardo IB, and Stanton B. Social and psychological factors associated with AIDS risk behaviours among low-income, urban, African American adolescents. *Journal of Research on Adolescence 1997; 7: 173-195.*
31. Republic of Botswana. *2011 ANC Sentinel Surveillance Survey.* National AIDS Coordinating Agency, Gaborone, Botswana, 2012.
32. Letamo G. Does correct knowledge about HIV and AIDS lead to safe sexual behaviour? The case of young people in Botswana. *African Population Studies 2011; 25(1): 44-62.*
33. Republic of Botswana. *Preliminary Botswana HIV/AIDS Impact Survey Results 2009;*
34. Stats Brief, May. National AIDS Coordinating Agency and Central Statistics Office.
35. Masatu MV, Kazaura MR, Ndeki S, and Mwampambe R. Predictors of Risky Sexual Behaviour among Adolescents in Tanzania. *AIDS Behaviour 2009; 13: 94-99. doi.10.1007/s10461-007-9292-x*