

# Prevalence and Factors Associated with Risky Sexual Behaviors among Patients with Severe Mental Illness in Uganda: A Descriptive Cross Sectional Study

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## Abstract

**Background:** Persons living with severe mental illness (SMI) which includes schizophrenia, bipolar affective disorder and recurrent major depressive disorder are predisposed to risky sexual behavior (RSB). There is a paucity of data on this problem in sub-Saharan Africa and where research has been undertaken, only a limited range of risk factors have been considered and most of it was undertaken before antiretroviral therapy was universally available, hence the need for this study. The objective of this study was to determine the prevalence and factors associated with risky sexual behavior among individuals with SMI attending care in central and south western Uganda. **Methods:** A cross sectional study was conducted among 393 persons with SMI attending two psychiatric out-patient facilities in Uganda. Psychiatric disorder was confirmed using MINI International Neuropsychiatric Interview version 7.2. RSB was defined as engaging in at least one of four risky sexual behaviours that have been associated with HIV infection in the Ugandan psychosocial environment in the last three months using an 8 item RSB questionnaire used for assessment of RSB. Prevalence of RSB and associated correlates were determined using multiple logistic regression. **Results:** The Prevalence of RSB in last 3 months' periods was 24.2% (95% CI: 20.2% - 28.7%). The factors that were independently significantly associated with RSB were: trauma related (history of childhood trauma, past and current sexual abuse, past and current

physical abuse) current psychosocial challenges (mental health stigma) and psychiatric illness factors (history of a past manic episode, current psychotic episode, severity of depressive symptoms and severity of manic symptoms).

**Conclusions:** One quarter of clinic attending respondents with severe mental illness in Uganda practice risky sexual behaviour. Factors associated with risky sexual behaviour fall under the domains of past and present trauma, current psychosocial challenges and psychiatric illness factors. This calls for a multi-sectoral approach that includes community awareness about the nature of SMI and the rights of persons with SMI and measures to improve Psychiatric symptom management.

## Keywords

Risky Sexual Behaviour, Severe Mental Illness, Adults, Uganda

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## 1. Background

Severe mental illness affects 3.2% of individuals worldwide [1], despite the fact that individuals living in low developed countries like Uganda being disproportionately affected by severe mental illness, there is limited data on the prevalence and correlates of severe mental illness in Uganda. Severe mental illness was defined as having any of the following disorders; which include schizophrenia, bipolar affective disorder and recurrent major depressive disorder. Patients with severe mental illness are predisposed to risky sexual behavior (RSB). Studies undertaken in middle income countries in South America and on the Indian sub-continent have reported equally high rates of RSB of between 7.0% to 70% [2] [3] [4] [5] [6]. Similarly, studies from sub-Saharan Africa have reported rates of between 7.0 to 49.1% [7]-[17]. Most of these studies from around the world have used a diversity of definitions for RSB which sometimes makes cross country comparisons difficult. Additionally, the studies that have been undertaken in sub-Saharan African have only considered a narrow band of risk factors and most were undertaken before antiretroviral therapy was universally available.

Studying RSB among individuals with SMI in HIV endemic sub-Saharan African settings such as Uganda is important because it is the single most important risk factor for HIV [16]. In Uganda, HIV infection rates among people with SMI have been estimated to be approximately 25.5%, much higher than the rates in the general population currently estimated to be 6.2% [17] [18] [19] [20]. Persons living with SMIs have been reported to be at risk for RSB for the following reasons: increased risk of experiencing exploitative sex and inter-partner violence [20]-[27]; the association of active SMI illness with impulsivity, altered judgment, increased sensitivity to personal rejection, low self-esteem, impaired reality testing [28] [29] [30] [31]; poor social support [28] [29] [30] [31]; perceived internal stigma [32] [33]; and use of substances of abuse [34] [35]. In this paper, we report on the prevalence of RSB among persons living

with severe mental illness attending care at an urban and a rural psychiatric health facility in Uganda in the era following widespread availability of antiretroviral therapy. Using standardized structured assessment instruments, we explored the association of RSB with a range of psychosocial and psychiatric illness factors.

## 2. Methods

### 2.1. Study Setting and Design

A cross-sectional study was conducted at two psychiatric facilities in Uganda, namely: Out-patient Department of Butabika National Referral Mental Hospital and the Mental Health Department of Masaka Regional Referral Hospital. Butabika National Referral Mental Hospital is situated 10 kilometers east of Kampala city and is the only tertiary referral facility for psychiatric management in the country. Butabika hospital has an in-patient bed capacity of 550 adults and an out-patient clinic. Masaka Hospital is located in rural south-western Uganda approximately 130 kilometers from Kampala city. It is a regional referral hospital with specialist services including a mental health department with an in-bed capacity of 30 adult patients and an out-patient clinic. This study was undertaken among consecutive outpatient attendees at both health facilities. Study inclusion criteria were: 1) Having a clinical diagnosis of either Schizophrenia or Bipolar affective disorder or Recurrent Major Depressive Disorder as reported in the patient's medical records [36]; 2) Adult aged 18 years and above; 3) Was clinically stable, on treatment and attending the outpatient departments of either Butabika or Masaka hospitals. Exclusion criteria were: a) Patients that fulfilled MINI-7.0.2 [37], criteria for a substance use disorder; b) Patients who did not understand any of the study languages (English or Luganda-predominant language spoken in central and south-western Uganda); c) Was too ill and required urgent psychiatric or medical attention; d) Patients unable to follow through with the interview for whatever reason.

### 2.2. Measures

Consented study respondents were consecutively enrolled into this study and assessed using a structured, standardized, locally translated psychosocial instruments. The tools were administered by the principal investigator (a psychiatrist) and trained psychiatric nurse/psychiatric clinical officer research assistants. Severe mental illness was confirmed using the MINI International Neuropsychiatric Interview version 7.2 [37]. RSB was defined as "over the last 3 months" period having engaged in any one of four risky sexual behaviours that have been associated with HIV infection in the Ugandan psychosocial environment, namely: engaging in unprotected sex (inconsistent use of condoms) with none regular partner, having multiple sexual partners, starting sex before age of 18 years and sex with commercial sex workers [37] [38] [39] [40]. The other variables collected included: 1) Socio-demographic factors (study site, gender, age category, religion,

**Table 1.** Data collection tools for the study.

Instrument used	Description	Questions or categories (examples)	Remarks	Reference
<b>Socio-demographic variables</b>				
Structured socio-demographic questionnaire; Study site, age, gender, ethnicity, educational level attained, socio-economic status (SEI), and religion	Socio-economic index (SEI) was constructed from commonly available household items in a typical Ugandan households, has previously been used by this (Kinyanda <i>et al.</i> , 2011 c)	Example of items used to assess SEI; <i>Does your household have electricity?</i> Response: Yes/no	Has previously been used by this study group.	
<b>Psychiatric illness and psychosocial factors associated with physical and sexual abuse</b>				
Primary diagnosis	Review of patient clinical records by senior mental health worker	Review based on DSM-5 criteria	Question: <i>What is the primary psychiatric diagnoses of this patient?</i> Responses: 1 = Schizophrenia 2 = Bipolar affective disorder 3 = Recurrent Major depressive disorder	[36]
Childhood trauma	Childhood Trauma Questionnaire-Short Form (CTQ-SF)	The Childhood Trauma Questionnaire-Short Form (CTQ-SF) is a 28-item questionnaire that assesses childhood trauma experiences.	Example of question items: <i>I got hit so hard by someone in my family that I had to see a doctor or go to the hospital.</i> Responses: 1 = Never true 2 = Rarely true 3 = Sometimes true 4 = Often true 5 = Very often true	[41]
Social support	Multidimensional Scale of Perceived Social Support	12-item questionnaire on perceptions of support received.	Example of items: <i>There is a special person who is around when I am in need.</i> Response: 1 = Strongly Disagree 2 = Mildly Disagree 3 = Neutral 4 = Mildly Agree 5 = Strongly Agree	Previously employed by this study group. [42]

Continued

		Dependent Variables		
Physical abuse	Obtained from the Uganda modified Life-events and histories module of the European Parasuicide Interview schedule (EPSIS I)	For each of the time periods: past adulthood (between age of 18 years to 12 months before the study); and recent adulthood (in the last 3 months before the interview), respondents were asked to indicate whether they had experienced each of 5-items related to physical victimisation. This was in relation to parent(s), siblings, or others.	Example of items: <i>Ever seriously beaten up or otherwise physically mistreated by those responsible for your upbringing?</i> Response: 1 = Yes 2 = No	Previously adapted to the Ugandan socio-cultural context by this study group. [43]
Sexual abuse	Obtained from the Uganda modified Life-events and histories module of the European Parasuicide Interview schedule (EPSIS I)	For each of the time periods: past adulthood (between age of 18 years to 12 months before the study); and recent adulthood (in the past 3 months before the interview), respondents were asked to indicate whether they had experienced each of 10-items related to sexual victimisation. This was in relation to parent(s), siblings, or others.	Example of items: <i>Did your father or mother ever force you to have sexual intercourse against your will?</i> Response: 1 = Yes 2 = No	Previously adapted to the Ugandan socio-cultural context by this study group. [42] [44]
Clinical and Behavioral Outcome Variables				
Mental health stigma	The Stigma Scale	16-items of the mental health stigma scale were used in this study.	Example of items: <i>I have been discriminated against in education because of my mental health problems</i> Response: 1 = Strongly Disagree 2 = Mildly Disagree 3 = Mildly Agree 4 = Strongly Agree	This tool was used for the first time in this study environment. Had a Cronbach Alpha of 0.71 [45]

## Continued

Severity of depressive episode	Hamilton depression rating scale (HAM-D)	The HAM-D is designed to rate the severity of depression in patients. It is a 21-item scale.	Example of items used: Depressed mood (Gloomy attitude, pessimism about the future, feeling of sadness, tendency to weep) Responses: 0 = Absent 1 = Sadness, etc. 2 = Occasional weeping 3 = Frequent weeping 4 = Extreme symptoms	This tool was used for the first time by this study group. Had a Cronbach Alpha of 0.80	[46]
Severity of manic episode	Young Mania Rating Scale (YMRS)	The YMRS rates the severity of manic symptoms that the patient may be experiencing. It is an 11-item scale. The 4 items of irritability, speech, thought content, and disruptive/aggressive behaviour are rated on a scale of 0 to 8. While the remaining 7 items are rated on a scale of 0 to 4.	Example of items; <i>Elevated mood</i> Response: 0 = Absent 1 = Mildly or possibly increased on questioning 2 = Definite subjective elevation; optimistic, self-confident; cheerful; appropriate to content 3 = Elevated; inappropriate to content; humorous 4 = Euphoric; inappropriate laughter; singing	This tool was used for the first time by this study group. Had a Cronbach Alpha of 0.71	[47]
Severity of psychotic episode	Clinician-rated Dimensions of Psychosis Symptom Severity Scale (CRDPSS)	We assessed five dimensions of psychosis using this scale. These were: hallucinations, delusions, disorganized speech, abnormal psychomotor behavior, and negative symptoms. For each item the research assistant (psychiatric nurses/psychiatric clinical officers) was asked to rate the severity of the symptom as experienced by the respondent during the past 7 days.	Example of items; <i>Hallucinations</i> Response: 0 = not present 1 = Equivocal (severity or duration not sufficient to be considered psychosis) 2 = Present, mild (little pressure to act upon voices, not very bothered by voices) 3 = Present, moderate some pressure to respond to voices, or is somewhat bothered by voices)	This tool was used for the first time by this study group. Had a Cronbach Alpha of 0.65	[48]

## Continued

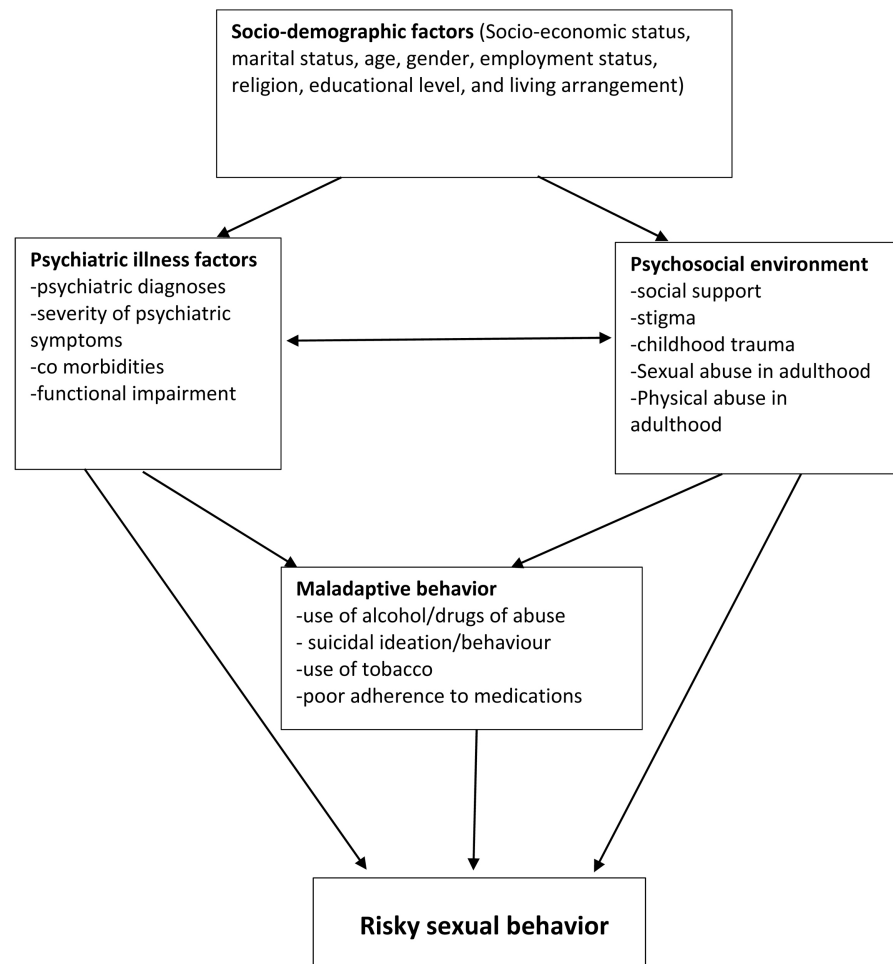
			4 = Present, severe (severe pressure to respond to voices, or is very bothered by voices)	
Risky sexual behaviour	Assessed for high risk sexual behaviours that have been associated with HIV transmission in the Ugandan cultural context	12-items on risky sexual behaviour that have been associated with HIV transmission in the Ugandan socio-cultural context.	Example of items: <i>In the last 3 months, have you had sex with anyone other than your regular partner?</i> Response: 1 = Yes 2 = No	Previously used in the HIV situation of Uganda by this research group. [44]

socio-economic status, and marital status); 2) Psychosocial factors (social support, mental health stigma, childhood physical abuse, childhood sexual abuse, physical abuse in adulthood and sexual abuse in adulthood); 3) Psychiatric illness factors (family history of psychiatric illness, past depressive episode, past manic episode, past psychotic episode, risky sexual behavior was the outcome variable. The tools used to assess these variables are described in **Table 1**.

In this study the dependent variable was the proportion of respondents with “risky sexual behavior” (RSB) whose prevalence was estimated together with exact binomial 95% confidence limits. To investigate the correlates of RSB, a conceptual framework based on the theories of both (Jessor *et al.* 1991 and Meade *et al.* 2005 was used [49] [50] (see **Figure 1**)). Using this model, variables were categorized as *general risk factors* (socio-demographic factors); *psychosocial risk and protective factors* (psychiatric illness factors, severity of psychiatric symptomatology, physical/sexual abuse, social support); *maladaptive behaviors* (alcohol/drug use, suicidal ideation/behaviour, poor adherence to medications); *risk perception factors* (beliefs about personal risk for HIV); and *risk outcomes* (which in this case is risky sexual behavior).

### 2.3. Statistical Analysis

Data was entered into Open Clinica and then exported to STATA® version 15 for data cleaning and analysis. Data analysis was guided by the above described conceptual framework. The dependent variable was risky sexual behaviour’ which was operationalized as an individual engaging in unprotected sex (inconsistent use of condoms), having multiple sexual partners, starting sex before age of 18 years and sex with commercial sex workers in the last 3 months. Univariate analysis was undertaken for the socio-demographic and clinical characteristics. Prevalence of RSB and the associated 95% confidence interval (CI) were determined.



**Figure 1.** Conceptual framework based on theories derived from Jessor (1991) and Meade and Sikkema (2005) [49] [50].

To ascertain the association between RSB and other variables binary logistic regression was performed. Variables with p value less than or equal to 0.20 at binary analysis were entered into multiple logistic regression analysis. Hosmer Lemeshow goodness of fit with backward elimination was used to test for model fitness. Variables with p value of < 0.05 at multiple regression were considered as statistically significant. The results were expressed as Odds Ratio (OR) and adjusted odds ratios (AOR).

### 3. Results

#### 3.1. Background

(Table 2) The study sample consisted of 393 individuals with severe mental illness attending Butabika National Referral Mental Hospital ( $n = 227$ , 57.8%) and Masaka Regional Referral Hospital ( $n = 166$ , 42.2%). Majority of respondents were females ( $n = 211$ , 53.4%) and unmarried ( $n = 267$ , 68.1%). Median (IQR) age was 36 (29, 46) years. Majority had little formal education (7 - 11 years) ( $n = 318$ , 70.9%), while about half ( $n = 212$ , 54%) were in some form of employment.



**Table 2.** Characteristics of the sample.

Factor	Level	N = 393 n (%)
Site	Butabika (urban)	227 (57.8%)
	Masaka (rural)	166 (42.2%)
Gender	Male	182 (46.3%)
	Female	211 (53.4%)
Age	Median (IQR)	36 (29.46)
Age (grouped)	<25	44 (11.2%)
	25 - 34	128 (32.6%)
	35 - 49	141 (35.9%)
	≥50	80 (20.4%)
Socio-economic status	Median (IQR)	4 (3.6%)
	0 - 2	60 (15.3%)
Socio-economic status (grouped)	3 - 4	145 (36.9%)
	5 - 6	151 (38.4%)
	7 - 8	37 (9.4%)
Marital status	Currently married	125 (31.9%)
	Widowed	17 (4.3%)
	Separated/divorced	102 (26.0%)
	Single	148 (37.8%)
Employment status	Farmer/fisherman	106 (27.0%)
	Professional	43 (10.9%)
	Informal employment	63 (16.1%)
	Unemployed	180 (45.9%)
Religion	Christian	317 (80.7%)
	Moslem	72 (18.3%)
	Others	4 (1.0%)
Education level	No formal education	13 (3.3%)
	Primary	164 (41.7%)
	Secondary	154 (39.2%)
	Tertiary	62 (15.8%)
Risky sexual behaviour	Butabika (urban)	28.2% (22.6% - 34.4%)
	Masaka (rural)	18.7% (13.4% - 25.4%)
	Male (24.7%)	24.7%
	Female (23.7%)	23.7%

A total of 24.2% (20.2 - 28.7) indulged in RSB, males were 24.7% and females were 23.7%. RSB was noted to be more prevalent in the urban setting (28.2%) (22.6% - 34.3%) compared to the rural setting 18.7% (13.4% - 25.4%).

### 3.2. The Prevalence of Risk Sexual Behaviour (RSB)

Overall, those who reported at least one risky sexual behaviour in the last 3 months was 24.2% (95% CI: 20.2 - 28.7), with higher rates 28.2% (95% CI: 22.6 - 34.4) reported in the urban hospital of Butabika compared to the rural hospital of Masaka 18.7% (95% CI: 13.4 - 25.4).

**Table 3.** Sexual behaviour associating with HIV risk.

Question	Level	N = 393 n (%)
In the last 3 months...		
Have you had sex with anyone other than your regular partner	Yes	49 (12.5%)
Have you engaged in sex in exchange for money/gifts	Yes	12 (3.0%)
Have you engaged in forced sex including rape	Yes	5 (1.3%)
Have you engaged in sex with someone much older/younger than you who is not your partner	Yes	17 (4.3%)
Have you suffered an STD (urethral discharge, painful discharge, sore in private areas)	Yes	10 (2.5%)
Have you had sex under the influence of alcohol or other substances of abuse	Yes	8 (2.0%)
Practiced at least one of the items above	Yes	95 (24.2%)
Practiced at least one of the items above and never used a condom regularly (n = 95)	Yes	29 (30.5%)

(Table 3) On the specific risky sexual behaviours practiced over the last 3 months, the following was reported: ever had sex with anyone other than their regular partner (n = 49, 12.5%); sex in exchange for money/gifts (n = 12, 3.0%); forced sex including rape were (n = 5, 1.3%); sex with someone much older or younger (n = 17, 4.3%); ever suffered a sexually transmitted disease (n = 10, 2.5%); sex under the influence of alcohol and other substances of abuse (n = 8, 2.0%). Only about a third of individuals who practiced RSB (n = 29, 30.5%) had never used a condom in the last 3 months.

(Table 4) The psychosocial factors significantly associated with RSB were: mental health stigma (AOR = 1.04, 95% CI: 1.01 - 1.08; childhood trauma (AOR = 1.02, 95% CI: 1.01 - 1.04); past and current sexual abuse (AOR = 3.48, 95% CI: 1.97 - 6.14 and (AOR = 8.92, 95% CI: 4.01 - 19.85) respectively; past and current physical abuse (AOR = 2.10, 95% CI: 1.28 - 3.44) and (AOR = 2.66, 95% CI: 1.43 - 4.94) respectively. All analyses were adjusted for age, gender and marital status of the respondents, significant at 5% level of significance.

(Table 5) The psychiatric illness factors that were significantly associated with RSB were: current psychotic episode (AOR = 1.92, 95% CI: 1.11 - 3.32); a past manic episode (AOR = 1.88, 95% CI: 1.04 - 3.39); the severity of depressive symptoms (AOR = 1.09, 95% CI: 1.03 - 1.14); severity of manic symptoms (AOR = 1.16, 95% CI: 1.08 - 1.25); and use of alcohol and substances of abuse (AOR = 2.45, 95% CI: 1.31 - 4.57). Individuals who had severe symptoms of depression and mania had a unit increase in RSB (1.03; 1.14) and (1.08; 1.25) respectively.

(Table 6) Individuals with severe mental illness who used alcohol were more likely to have RSB (1.31; 4.57),  $p = 0.005$ . on the association between RSB and maladaptive behaviour, perception of severe risk of getting HIV was significantly associated with RSB (AOR = 3.08, 95% CI: 1.43; 6.66) compared with low risk.

**Table 4.** Socio-factors associating with risky sexual behavior.

Factor	level	aORs	95% CI	Likelihood ratio pvalue
Social support scale	Per unit increase	1.01	(0.98; 1.03)	0.674
Mental health stigma scale	Per unit increase	1.04	(1.01; 1.08)	0.017
Childhood trauma questionnaire	Per unit increase	1.02	(1.01; 1.04)	0.002
Past sexual abuse in adulthood	No Yes	1 3.48	reference (1.97; 6.14)	<0.001
Current sexual abuse in adulthood	No Yes	1 8.92	reference (4.01; 19.85)	<0.001
Past physical abuse in adulthood	No Yes	1 2.10	reference (1.28; 3.44)	0.003
Current physical abuse in adulthood	No Yes	1 2.66	reference (1.43; 4.94)	0.002
Family member ever had mental illness	No Yes	1 1.52	reference (0.92; 2.49)	0.099

**Table 5.** Psychiatric illness factors.

Factor	level	aORs	95% CI	Likelihood ratio pvalue
<b><i>Current episodes</i></b>				
Current depressive episode	Yes	1.21	(0.62; 2.34)	0.576
Current manic episode	Yes	2.06	(0.91; 4.67)	0.082
Current psychotic episode	Yes	1.92	(1.11; 3.32)	0.018
<b><i>Past episodes</i></b>				
Past depressive episode	Yes	1.35	(0.81; 2.24)	0.245
Past manic episode	Yes	1.88	(1.04; 3.39)	0.036
Past psychotic episode	Yes	1.14	(0.65; 2.01)	0.651
<b><i>Severity of episodes</i></b>				
Severity of depressive symptoms	Per unit increase	1.09	(1.03; 1.14)	0.002
Severity of Manic episodes	Per unit increase	1.16	(1.08; 1.25)	<0.001
Severity of psychotic episodes	Per unit increase	1.07	(0.95; 1.20)	0.260

**Table 6.** Maladaptive behavior.

Factor	level	aORs	95% CI	Likelihood ratio pvalue
Use of alcohol/drugs	Yes	2.45	(1.31; 4.57)	0.005
Use of Tobacco	Yes	1.59	(0.60; 4.18)	0.348
Missed taking psychiatric pills in the last 3 days	Yes	1.22	(0.70; 2.14)	0.479
If taking ART, Missed taking art medication in the last 3 days	Yes	0.89	(0.05; 14.52)	0.934

### 3.3. Discussion

Risky sexual behavior is the most common behavioral disorder and public health is important at the global level. The study found that a number of participants met criteria for risky sexual behavior. In this study, we assessed the prevalence of RSB and factors associated to RSB among individuals with severe mental illness receiving care at Butabika national referral mental hospital and Masaka regional referral hospital in Uganda.

### 3.4. Prevalence of RSB

The prevalence of RSB was 24.2%. The Prevalence among male and female individuals was 24.7 and 23.7% respectively, 28.2% in Butabika hospital and 18.7% in Masaka hospital for the last 3 months' period compared to the general population, which is 6.2% [51]. Other studies have reported a higher prevalence of 25.8%-48% [15] [52] [53]. This shows how vulnerable individuals with severe mental illness are as far as RSB is concerned. However, the prevalence in our study was higher than that obtained in India (5.5%) among inpatients with mental illness, maybe because these were inpatients and hence were not sexually at risk at the time of the study and the prevalence was lower among school going adolescents in Nigeria respectively [54] [55]. Our prevalence was comparable in other studies 22.4-26% [56] [57]. The possible reason for the difference might be differences in study design, sample size, data collection tool and cultural differences in study population. In our study, RSB was more common among urban individuals, a factor which was significant in a study carried out in Ethiopia [52]. The odds of having risky sexual behavior was higher among clients living in urban than living in rural area. It might be due to prostitution, being homeless which is more common in urban than rural area This may be because urban dwellers usually have to buy literally everything in order to live including paying for their accommodation yet in rural settings accommodation is generally free and food is cheap, which can be obtained in one's garden [54].

In this study sample, 12.5% reported ever having had sexual exposure with anyone other than their regular partners. This is lower than a study done in Ethiopia [55]. Those who had engaged in sex in exchange for money/gifts was

3.0%, those who had engaged in forced sex including rape was 1.3%; those who had engaged in sex with someone much older/younger (4.3%); those who had suffered a sexually transmitted disease (2.5%). About 2.0%, were reported to have had sex under the influence of alcohol and other substances of abuse, this is lower than findings from a study done in Ethiopia among patients with Bipolar affective disorder, where the prevalence was 49.1% [16]. Alcohol use prevalence was comparable to a study done in Nigeria [14], among patients with severe mental illness. Overall, 24.2%, practiced at least one of the above behaviors and 30.5%, never used a condom in the last 3 months. This is lower than studies done elsewhere [55] [56]. But these studies were done among the youth. However, our prevalence is still high may be due to low self-esteem and high internal stigmatization in individuals with severe mental illness younger adults with mental illness may result in a failure to provide healthier romantic relationship and are associated with failure to advocate for safer sex.

### 3.5. Factors Associated with Risky Sexual Behaviour

In this study, physical abuse predicted unprotected sex and mediated effects of emotional maltreatment on unprotected sex and on assertiveness in sexual refusal and the effects of sexual abuse on unprotected sex. These findings are comparable to studies done elsewhere [57] [58] [59] [61]. Both past and current sexual and physical abuse emerged as important factors in risky sexual behavior. The two past events appear to be an important pathway by which maltreatment confers risk for risky sexual behavior. Interventions to reduce risky sexual behavior should include assessment and treatment for trauma symptoms and for history of child maltreatment in all its forms [61].

Our findings underscore the need to better understand the mechanisms underlying the association between childhood sexual abuse and long-term outcomes. Some existing research points to biological mechanisms through which childhood abuse increases the risk of psychopathology. For example, the effect of childhood sexual abuse on obesity might be due to depression [32] [62] [63] [64] [65] [66]. Proponents of the child development model argue that exposure to abuse in childhood negatively impacts on the child's development leading to cognitive, psychological, and social impairment [67] [68] [69] [70].

## 4. Conclusion

The prevalence of risky sexual behavior among individuals with severe mental illness was found to be high compared to the general population. Individuals with severe mental illness who are female, in urban areas, who are current alcohol users, who have a history of physical and sexual abuse, those with past manic episodes, current psychotic episodes and those present with severe symptoms of depressive and manic disorders should be assessed for risky sexual behaviour. Interventions should contain widespread sexual and reproductive health awareness on issues such as sexual education safe sex and sexually transmitted infections for individuals with severe mental illness in various health care facilities.

## 5. Limitations of the Study

In general, the present study reported the burden of RSBs and associating factors among individuals with severe mental illness. The sensitive nature of sexual behaviors on face-to-face interview could have a social desirability bias. Moreover, this study is institution-based study. Therefore, the findings cannot be generalized to those who remain undiagnosed or untreated in the community.

## Declarations

### Acknowledgements

All individuals who participated in this study, my supervisors, research assistants and the members of Butabika National mental hospital and Masaka regional referral hospital.

### Availability of Data and Materials

The data that support the findings of this study are available from Medical Research Council/Uganda Virus Research Institute & London School of Hygiene and Tropical Medicine, Uganda research unit (MRC/UVRI & LSHTM) but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of MRC/UVRI & LSHTM.

### Authors' Contributions

BC designed the study, analyzed and interpreted the data. WS guided the data analysis, NK reviewed data analysis results, NN reviewed the literature review and implementation of study. EK reviewed the study, analysis and interpretation of the data. EK contributed in reviewing the manuscript. EK sought and obtained funding. All authors read and approved the final manuscript.

### Ethics Approval and Consent to Participate

I confirm that the proposal, research tools were approved before the study commenced and to conduct the study was obtained from the Higher Degrees Research Ethics Committee (HDREC), the Uganda National Council of Science and Technology (HS 2337), the Uganda Virus Research Institute's Research and Ethics Committee (GC/127/19/10/612) and Permission was obtained from Directors of Butabika National Referral Mental and Masaka Regional Referral Hospital. Written informed consent was obtained from all participants. I confirm that all methods were carried out in accordance with relevant guidelines and regulations (HDREC, UVRI and UNCST). Confidentiality was ensured by using de-identified codes.

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### Conflicts of Interest

The authors declare that they have no competing interests.

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