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Factors Associated with Consistent Condom Use Among Women Engaged in Sex Work: Lessons From the Kyaterekera Study in Southwestern Uganda

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Abstract

We examined the factors associated with consistent condom use among women engaged in sex work in the Southern parts of Uganda. We used baseline data from a longitudinal study involving WESW from 19 hotspots in Southern Uganda. We conducted hierarchical models to determine the individual, economic, behavioral, and health-related factors associated with consistent condom use. We found that, alcohol use (b=-0.48, 95% CI=-0.77, -0.19), accepting money for condomless sex (b=-0.33, 95% CI=-0.38, -0.28), multiple customers (b=-0.01, 95% CI=-0.01, -0.005), being married (b=0.50, 95% CI=0.01, 0.99), owning more assets (b=0.08, 95% CI=0.05, 0.13), having another income earner in the household (b=0.55, 95% CI=0.27, 0.83), condom use self-efficacy (b=0.11, 95% CI=0.03, 0.19), condom use communication (b=0.06, 95% CI=0.001, 0.12), and being knowledgeable about HIV/STIs transmission (b=0.08, 95% CI=0.01, 0.15) were associated with consistent condom use. Additionally, 29% of the women were consistent condom users. Hence, there is need to implement interventions that promote consistent condom use among WESW.

Keywords Consistent condom use · Women engaged in sex work (WESW)

Background

Human immunodeficiency virus (HIV) is among the diseases causing the highest morbidity and mortality every year in sub-Saharan Africa (SSA) [1], with the greatest burden among women engaged in sex work (WESW) [2]. The current global statistics indicate that, the risk of acquiring HIV is 26 times higher among WESW as compared to other women [3]. In Uganda, the HIV prevalence is 31.3% among WESW, which is six times higher than the national average of 5.4% [4].

The situation is worsened by the criminalization of sex work in the country. Criminalization of sex work hinders the implementation of HIV prevention and treatment programs, especially those targeting WESW [5]. Moreover, combined with stigma and discrimination from health care providers, lack of friendly services, lack of transport to access health clinics, and low literacy levels, further deter women from accessing and utilizing HIV prevention and treatment services [6, 7]. Therefore, access to preventive mechanisms among WESW is critical in minimizing the spread of HIV in highly impacted communities, such as those in Uganda. Condom use is recognized as an affordable and accessible preventive mechanism to HIV prevention and transmission of sexually transmitted infections, including HIV [7–10]. However, access and utilization of condoms among WESW

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is shaped by multilevel factors, including individual, social, economic, environmental, and structural factors.

A few studies have been conducted in Uganda to ascertain the factors associated with consistent condom use among WESW, which include but are not limited to poverty, age, education level, alcohol and substance use, having multiple sexual customers, criminalization of sex work [11–15]. However, these studies were in Kampala, the capital city where preventive services, including condoms may be readily available [7], highlighting the need for literature on WESW in other parts of the country, especially in semi-urban and rural areas – where the HIV prevalence is higher than the national coverage [4]. Also, these studies mainly focused on individual and structural factors. There is still a need to understand the effect of behavioral, economic and health related factors on condom use in this population. Therefore, this study assesses the factors associated with consistent condom use among WESW in Southern Uganda.

Theoretical Framework

The study is guided by the Brofenbrenner's socioecological model, a theory-based framework that examines multilevel factors that influence individual behavior [16]. According to Bronfenbrenner, understanding human behavior goes beyond direct observation to examining multiple systems of influence. He divides the systems of interaction into the micro, meso, exo, and macro systems. Our study examined factors at the micro and exo systems that influence consistent condom use among WESW. A microsystem contains multifaceted relations between an individual and their immediate environment. Hence behavior is examined in terms of process rather than content [16]. We identify the micro factors at the individual level, to include women's age, marital status, education experience, and household size, and how these affect women's behavior as regards to consistent condom use. The exo factors, as explained by Bronfenbrenner's model, refer to the forces within the larger social systems in which the individual is embedded and how these influence behavior [16, 17]. Hence these factors do not directly impact the individual but can exert both negative and positive interactive forces on the individual's behavior [18]. In the present study, we defined these factors to include economic (debts, lack of employment, financial distress, financial self-efficacy), behavioral (substance use, alcohol use, multiple sexual customers, condom use self-efficacy), and health-related factors (HIV/STIs knowledge, access to medical care).

Methodology

Study Sample and Recruitment

We used baseline data from, a 5-year National Institute of Mental Health (NIMH)-funded study aimed at reducing HIV risks among WESW in Southern Uganda. The study details are published in Ssewamala et al. [19]. The study recruited 542 women from 19 HIV "hotspots" (small towns) across four districts in Southern Uganda. Women were eligible to participate in the study if they: (1) were at least 18 years old; (2) reported having engaged in vaginal or anal sexual intercourse in exchange for money, alcohol, or other goods in the preceding 30 days; and (3) reported at least one episode of unprotected sexual intercourse in the past 30 days with either a paying, casual, or regular sexual partner[20] The research team engaged community stakeholders currently working in the study region to identify and recruit WESW into the study from the potential sites [20].

Data Collection

All study instruments and consent forms were translated into the local language (Luganda, the most widely used language in the study region) by a certified translator from the Department of Languages at Makerere University. To ensure that the tools were culturally and linguistically appropriate, the study team worked with stakeholders in reviewing the documents to help infuse experiences relevant to WESW [20]. Research assistants completed the research ethics training, including the Collaborative Institutional Training Initiative (CITI), Human Subjects Protection training and Good Clinical Practice training before engaging with study participants.

Measures

The primary outcome for the study was consistent condom use during vaginal sex with a male paying sexual partner. Condom use was defined as the percentage of times the participant used a condom during vaginal sex in the preceding 30 days. In calculating this percentage, the numerator was the number of times that a condom was used during those encounters, while the denominator was the number of times the participant had engaged in vaginal sex in the preceding 30 days. After getting the percentage, we dichotomized the outcome into consistent (100%) and inconsistent (less than 100%) condom use.

Individual Level Factors

We ascertained information on demographics, household, and sex-work related characteristics of the participants, including their age (continuous), marital status, education level and household size (total number of people in the household including children and adults).

Economic Level Factors

The variables included, asset ownership, financial distress, financial self-efficacy, whether a participant had a debt with someone, having another income earner in the family as well as current employment of the participant. Asset ownership was measured on a 21-item scale. The scale comprised a list of household assets such as house, land, gardens, cattle, means of transport, and whether a family owned a small business. An asset index was generated from the scale (range 0–21) where by a higher score signified more assets owned by the participant's household (Cronbach alpha = 0.85).

Financial distress was measured using a five-item scale with a range of 5–20. The scale assessed the participant's financial ability to meet basic needs such as food, clothing, transportation, housing fees, and medical expenses. Responses were coded from 1 = "Never" to 4 = "Many times". A higher score indicated higher levels of financial distress (alpha = 0.80).

Financial self-efficacy was assessed using a four-item scale adapted from the domestic violence-related financial issues scale [21]. The questions assessed the ability of the participant to meet their financial goals, including becoming financially secure, obtaining adequate employment, building up savings, and paying off their debts. Responses were rated on a 5-point Likert scale, with 1 = Not confident at all = 1 and Extremely confident = 5, with a higher score indicating financial self-efficacy. The theoretical range was 4–20, with a Cronbach alpha of 0.84.

Behavioral Factors

These were measured using the following indicators: (i) "*Have you used recreational drugs in the past 30 days*", (ii) "*Have you used alcohol in the past 30 days*", (iii) "*How many different customers have you had in the past 30 days who gave you cash, good, drugs or other services for sex*", (iv) "*How many days of the week do you engage in sex work*", (v) "*Have your paying customers offered you more money, good or services not to use a condom*", and (vi) condom use and condom communication self-efficacy.

Condom use self-efficacy was assessed using an eight-item scale with questions on the participants' confidence in using condoms with their male sexual partners [22].

Responses were coded from 1 = *Not at all confident* to 3 = *very confident*. The theoretical range was 8–24, with a higher score indicating more confidence in using a condom (alpha = 0.87). Similarly, participants were asked questions on condom use communication to examine how well they would communicate their condom use preferences with their paying sex customers. Questions on this scale were adopted from the couples' communication scale [23]. The questions were assessed using a five-item Likert scale ranging from 1 = *definitely no* to 5 = *definitely yes*. A higher score indicated ease of communication/discussion about condom use with their customers. The theoretical range was 5 to 25 (a Cronbach alpha of 0.89).

Health Related Factors

These included; (a) participants' knowledge of HIV/STI transmission, which was assessed on a 12 item scale adapted from the Brief HIV knowledge questionnaire [24], with true/false statements. A higher score indicated correct knowledge about HIV/STI transmission (range = 0–12, alpha = 0.81); (b) access to medical care was assessed using 6 items related to seeking medical care in the past 12 months with responses coded from 1 = *strongly disagree and 5 = strongly agree* (5) [25]. Summated scores were created with higher scores indicating ease in access to medical care (range = 7–30, alpha of 0.59); (c) we also included participants biological test results when confirmed positive from a laboratory test. Three STIs were tested -Gonorrhea, trichomoniasis, and chlamydia.

Analysis Procedures

Data were analyzed using STATA SE, Version 17 (Stata-Corp, College Station, TX 77,845). To adjust for clustering at the level of the hotspots/sites, we declared the data as survey data. Descriptive statistics were run to summarize the social-demographic characteristics. Continuous variables were summarized using means and standard deviations, while the categorical variables were summarized using percentages and proportions.

We fitted hierarchical linear regression models to examine how blocks of predictor variables were associated with our primary outcome. Model one includes individual factors, including age, marital status, education level, and the number of people in the household. In Model two we introduce economic factors, including asset ownership, financial distress, financial self-efficacy, having a debt, other income earner in the household, and current employment of the participant. These are introduced over and above the individual factors (in Model 1). Model three introduces behavioral factors, including drug use in the past 30 days, alcohol use in

Table 1 Characteristics of 542 women engaged in sex work

Variable	Number (%)
Individual factors	
Age (Mean, SD)	31.4 (7.18)
Marital Status	
Single/Never married	72 (13.3)
Married/In a relationship	139 (25.7)
Divorced/Widowed/Separated	331 (61.1)
Education Level	
Up to primary education	344 (63.47)
Secondary and Higher Education	198 (36.53)
Number of people including adults and children (mean, SD)	3.60 (2.19)
Site Location	
Fishing sites	131 (24.2)
Rural	120 (22.1)
Small towns	291 (53.7)
Economic factors	
Debt (currently owe money to someone)	388 (71.6)
Asset factor index (mean, SD	5.52 (4.14)
Financial distress scale (mean, SD)	14.47 (4.5)
Financial self-efficacy index (mean, SD))	8.49 (4.1)
Having another income earner in the family	1.37 (0.48)
Currently employed	128 (23.6)
Behavioral factors	
Have you used drugs in the past 30days	74 (13.65)
Have you used alcohol in the past 30days	342 (63.1)
Multiple customers in the last 30 days (mean, SD)	33.44 (47.41)
Days of the week engaged in sex work (1–7)	5.09 (1.82)
Customers offered more money with no condom	316 (58.3)
Condom use self-efficacy (mean, SD)	19.0 (4.71)
Condom communication self-efficacy (mean, SD)	21.0 (4.47)
Health-related factors	
HIV Knowledge (mean, SD)	5.48 (2.31)
Access to medical services (mean, SD)	19.22 (4.51)
Sexually Transmitted Infections	
Chlamydia	14 (2.6)
Gonorrhea	7 (1.3)
Trichomonas	40 (7.4)
Condom Use (Proportion estimation)	
Consistently used a condom (100% condom use)	150 (28.6)
Inconsistent condom use	374 (71.4)

the past 30 days, number of different customers in the past 30 days, number of times participants engaged in sex work in a week, condom use self-efficacy and condom use communication. Factors in model three are over and above models one and two. The fourth model assessed health-related factors, including participants' knowledge on HIV/STIs transmission, access to care, and whether participants had any STIs. Model four factors are introduced over and above models one, two and three. In all models, we adjusted for clustering at the site level. All p-values of 0.05 or less were considered statistically significant.

Results

Sample Characteristics

Table 1 presents the characteristics of participants enrolled in the study.

Individual Characteristics

A total of 542 WESW were recruited in the study. The average age was 31.4 years (SD = 7.18, range = 18–55 years). Majority of participants (61%, n = 331) were either divorced/widowed or separated from their partners, and 63.5% (n = 344) had achieved up to primary education. In addition, 53.7% (291) of the women lived in small towns.

At the economic level of influence, 76% (n = 414) of the participants were not employed at the time of enrollment, and most of them (71%, n = 388) had debts. Participants reported moderate scores on financial self-efficacy (mean = 8.5, range 4–20), and mean = 14.5 (5–20) on the financial distress scale. Over half of the participants, 58% (n = 316) reported having received offers for more money from customers to engage in condomless sex.

As far as behavioral and health related factors are concerned, 74% (n = 342) and 13% (n = 74) of participants reported using alcohol and drugs in the past 30 days, respectively. On average, 33 sexual partners were reported by women in the past 30 days, with an average of 5 days engaged in sex work per week. Women reported an average score of 5.5 (0–12) on their HIV/STIs transmission knowledge and mean = 19.2 (7–30) on their access to medical services. Of the total sample, 2.6% of the participants tested positive for chlamydia, 1.3% for Gonorrhea, and 7.4% for trichomoniasis. In addition, participants reported high scores for condom use self-efficacy (mean = 18.9, range 8–24) and mean = 20.9 (5–25) for condom use communication scales.

Factors Associated with Consistent Condom use

Results from the hierarchical regression models are presented in Table 2.

Model one includes individual level factors. Model 1 explains 2% variance in the primary outcome (Pseudo $R^2 = 0.016$). Specifically, in model 1, we find that marital status and education were significantly associated with consistent condom use. In particular, married women were more likely to use condoms consistently than the single and divorced women (b = 0.60, 95% CI = 0.18, 1.04, p = 0.006). In addition, women with secondary education were more likely to use condoms consistently compared to those with primary education or less (b = 0.22, 95% CI = 0.13, 0.31,

		Model 1	Model 2	Model 3	Model 4
Table 2 A hierarchical regression model showing factors associated with consistent condom use among women engaged in sex work	Characteristics	**β (95% CI)**	**β (95% CI)**	**β (95% CI)**	**β (95% CI)**
	Individual factors				
	Age	-0.01(-0.02,0.01)	0.01 (-0.10, 0.02)	0.01 (-0.01, 0.02)	0.002 (-0.02, 0.02)
	Marital status				
	Single/Never married	**Ref**	**Ref**	**Ref**	**Ref**
	Married/In relationship	**0.61 (0.18, 1.04)**	**0.78 (0.21, 1.35)**	0.53 (-0.04, 1.10)	**0.50 (0.01, 0.99)**
	Divorced/widow/separated	-0.01(-0.16, 0.15)	0.11 (-0.001, 0.22)	-0.03 (-0.19, 0.13)	-0.08 (-0.34, 0.18)
	Education level				
	Received up to primary education	**Ref**	**Ref**	**Ref**	**Ref**
	Secondary and higher	**0.22 (0.13, 0.31)**	**0.17 (0.02, 0.32)**	0.17 (-0.15, 0.48)	0.17 (-0.22, 0.56)
	Household size (adults and children	0.02 (-0.05, 0.08)	-0.02 (-0.12, 0.07)	-0.04 (-0.18, 0.10)	-0.05 (-0.19, 0.10)
	Economic factors				
	Asset ownership		**0.08 (0.04, 0.13)**	**0.08 (0.05, 0.12)**	**0.08 (0.05, 0.13)**
	Financial distress		-0.02 (-0.08, 0.04)	-0.01 (-0.06, 0.03)	-0.01 (-0.06, 0.05)
	Financial self-efficacy		-0.01 (-0.04, 0.02)	0.01 (-0.02, 0.04)	-0.01 (-0.03, 0.05)
	Participant has a debt with some one		-0.12 (-0.36, 0.13)	-0.07 (-0.44, 0.29)	-0.07 (-0.46, 0.32)
	Household has other income earners		**0.59 (0.46, 0.72)**	**0.54 (0.27, 0.81)**	**0.55 (0.27, 0.83)**
	Participant is currently employed		**-0.23 (-0.41, -0.04)**	-0.14 (-0.40, 0.11)	-0.15 (-0.42, 0.12)
	Behavioral factors				
	Used drugs in the past 30 days			0.08 (-0.12, 0.29)	-0.06 (-0.12, 0.24)
	Used alcohol in the past 30 days?			**-0.48 (-0.79, -0.16)**	**-0.48 (-0.77, -0.19)**
	Multiple customers in the past 30 days			**-0.01 (-0.01, -0.01)**	**-0.01 (-0.01, -0.01)**
	Days of the week engaged in sex work			-0.05 (-0.23, 0.12)	-0.06 (-0.25, 0.13)
	Condom use self-efficacy			**0.11 (0.03, 0.19)**	**0.11 (0.03, 0.19)**
	Communication about condom use			**0.06 (0.002, 0.12)**	**0.06 (0.001, 0.12)**
	Customers offered more money with no condom			**-0.36 (-0.39, -0.33)**	**-0.33 (-0.38, -0.28)**
	Health related factors				
	Knowledge of HIV/STIs transmission				**0.08 (0.01, 0.15)**
	Has access to medical care				0.02 (-0.07, 0.11)
	Having any STIs				-0.06 (-0.79, 0.67)
	Constant	-1.22 (-1.5,-0.95)	-1.76 (-2.91, -0.61)	-4.42 (-8.22, -0.62)	-5.12(-10.92, 0.69)
	Pseudo R^2	0.016	0.055	0.123	0.128
	Incremental R^2		0.039	0.068	0.005

$p < 0.001$). Age and household size were not significant in the model.

When we regressed economic factors on the individual characteristics, the model explained 6% (Pseudo $R^2 = 0.055$)

variance in consistent condom use. We noted that being married (b = 0.78, 95% CI = 0.21, 1.35, p = 0.008) and having secondary education and higher (b = 0.17, 95% CI = 0.02, 0.32, P = 0.023) were still significant in the model. In addition, participants with more assets (b = 0.08, 95% CI=-0.04, 0.13, p < 0.001) and those that had another income earner in the family (b = 0.59, 95% CI = 0.46, 0.72, p < 0.001) were more likely to use condoms consistently. On the other hand, women who were unemployed were less likely to use condoms consistently (b=-0.23, 95% CI=-0.41, -0.04, p = 0.018).

When we included behavioral factors in our third model, they significantly affected the model as they explained 12% of the variance in the primary outcome (Pseudo R2 = 0.123). Specifically, having more assets (b = 0.08, 95% CI = 0.05, 0.12, p < 0.001) and another income earner in the household (b = 0.54, 95% CI = 0.27, 0.81, p < 0.001) were still associated with consistent condom use. Additionally, alcohol use in the past 30 days (b=-0.48, 95% CI=-0.79, -0.16, p = 0.003), having multiple sexual customers (b=-0.01, 95% CI=-0.009, -0.005, p < 0.001) and receiving offers for more money to engage in condomless sex (b=-0.36, 95% CI=-0.39, -0.33, p = < 0.001) were all associated with inconsistent condom use. Conversely, participants who were confident in using condoms (b = 0.11, 95% CI = 0.03, 0.19, p = 0.008) and communicated condom use with their sexual partners (b = 0.06, 95% CI = 0.002, 0.12, p = 0.041) were more likely to use condoms consistently.

In model four, we included health-related factors. In this model we regressed health related factors on the individual, economic and behavioral factors. The model explained 13% of the variance in the primary outcome (Pseudo R2 = 0.128). Being married (b = 0.50, 95% CI = 0.01, 0.99, p = 0.047), having more household assets (b = 0.08, 95% CI = 0.05, 0.13, p < 0.001), having another income earner in the family (b = 0.55, 95% CI = 0.27, 0.83, p < 0.001), were still associated with consistent condom use. In addition, being offered more money to engage in condomless sex (b=-0.33, 95% CI=-0.38, -0.28, p < 0.001), having multiple sexual customers (b=-0.01, 95% CI=-0.01, -0.005, p < 0.001) and having used alcohol in the last 30 days (b=-0.48, 95% CI=-0.77, -0.19, p = 0.001) remained significant predictors of inconsistent condom use. Participants who scored high on condom use self-efficacy (b = 0.11, 95% CI = 0.03, 0.19, p = 0.009), condom use communication (b = 0.06, 95% CI = 0.001, 0.12, p=0.044), as well as HIV/STIs transmission knowledge (b = 0.08, 95% CI = 0.01, 0.15, p = 0.036) were more likely to use condoms consistently. Comparing the R squared across all models, model 3 which includes the behavioral level factors explained the most variance with a 7% increase from (R^2 = 0.055 to R^2 = 0.123).

Discussion

This study examined the factors associated with consistent condom use among women engaged in sex work in Southern Uganda. Guided by the Brofenbrenner's socioecological model [16], we examined the individual, economic, behavioral and health-related factors associated with consistent condom use among WESW. Study findings show that 71% of our participants reported inconsistent condom use in the past 30 days, a percentage which is higher compared to the previous studies conducted in the country. For instance, a systematic review conducted by Muldoon in Uganda revealed that, between 33 and 55% of sex workers reported inconsistent condom use [7]. In addition, Bukenya and colleagues reported that 40% of the study sample were not using condoms consistently in the study conducted in Kampala- the main capital of the country [13]. Given the high prevalence of HIV among this group [3], strategies to promote consistent condom use and reduce the risk of HIV transmission are highly required.

Among individual level factors, marital status and education level were significantly associated with consistent condom use in our study. Specifically, the findings revealed that being married was associated with consistent condom use. This could be due to the women's need to protect themselves against contracting HIV or any STI, especially if they engage in sex work in secret. According to Muldoon, female sex workers with permanent partners are determined to protect themselves and their partners [7]. Additionally, a study conducted by Tenkorang revealed that most married women who engage in sex work used condoms as a contraceptive method to avoid unwanted pregnancies [26]. Other studies have highlighted that married women prefer condoms to strike a balance between the need to support their families and remain healthy to live longer and take care of their children [12].

In addition, education level was associated with consistent condom use. Specifically, participants with secondary school and above were more likely to use condoms consistently compared to those with primary education or lower. These findings align with other studies that have documented a strong relationship between education levels and condom use [13, 27, 28]. This could be attributed to exposure to information regarding condom use and also the ability to understand and interpret the information materials, which give women the confidence to negotiate safe sex among those with higher education [28, 29]. Also, having higher levels of education may give women other employment options, hence having less pressure to meet their economic and social needs than their counterparts with low education levels [30]. Therefore, availability of user friendly information related to condom use, that takes into account the

language that is understandable and relevant to those with low literacy levels, is critical to help enhance uptake and consistent use of condoms among WESW.

Regarding economic factors, household assets and having another income earner in the family, were associated with consistent condom use. In particular, women who reported to have more assets as well as another income earner in the family were more likely to use condoms consistently. It could be that women use assets as collateral in case of any economic pressure compared to those without assets. In addition, sharing financial burden with another person may reduce the financial stress that may require women to engage in sex work more often or have multiple different sexual partners – which may increase the risk of condomless sex. Moreover, previous studies have documented that it is hard for the women who are financially desperate to use condoms consistently, even when they want [31], while Patel et al's findings revealed that financial security was associated with safer sex practices among female sex workers[32]. Taken together, these findings point to the need for economic empowerment strategies and training, to provide skills to women engaged in sex work, which may, in the long run, provide an alternative source of income and minimize the economic pressures that push them to engage in condomless sex to earn more money [33].

Within behavioral and health related factors, condom use self-efficacy and being knowledgeable about HIV/STIs transmission were associated with consistent condom use. Self-efficacy for condom use has been identified as a pillar in HIV prevention, with an argument that, individuals who are confident in their ability to use condoms are more likely to use them [34–36]. Also, participants who had knowledge on HIV/STIs transmission were more likely to use condoms consistently. This ascertains the importance of making information available to the key populations. For instance, in their study conducted among participants in Namibia, Fitzgerald-Husek and colleagues found that several participants did not know the causes of HIV and STI transmission [37]. Hence a poor awareness of self-protection could be a possible obstacle to the consistent use of condoms among women engaged in sex work [38]. Therefore, health education programs and campaigns aimed at sensitizing women engaged in sex work about the causes and effects of HIV and STIs should be strongly encouraged.

On the other hand, use of alcohol, engaging in sex with multiple customers and willingness to engage in condomless sex for more money were associated with inconsistent condom use. Similar studies have reported alcohol use as having an association with increased sexual risk-taking behaviors, including having multiple partners and the likelihood of having sexual intercourse without a condom [7, 11, 39].

One of the strength of our study is collecting data from a representative sample (n = 542) which offers room for generalization of the findings to other areas of the country. However, it is essential to note that these findings should be interpreted with caution due to some limitations. First, condom use was self-reported and may have reflected social desirability and recall bias. Also, we did not assess for PrEP use among our study population, which could impact condom use among WESW. Hence future studies could integrate the role of PrEP use when assessing factors that affect consistent condom use among WESW. In addition, the study used a cross-sectional design. Therefore, we cannot infer causal relationships. Using longitudinal data in future studies would help to ascertain the causal relationships between condom use and the factors assessed in this study. Also future studies should include qualitative research based on participants' experiences to ascertain contextual factors and the possible measures to promote consistent condom use among WESW. Ye and colleagues denote that, interventions aimed at promoting condom use among this population may be difficult without their involvement[38].

Conclusion and Implications

This study assessed individual, economic, behavioral and health-related factors associated with consistent condom use among women engaged in sex work in Southern Uganda. Findings showed that marital status, educational background, having another income earner in the family, having more assets in the family, being confident in communicating and using condoms as well as having knowledge on HIV/STIs transmission, were associated with consistent condom use. On the other hand, use of alcohol, having multiple customers and willingness to engage to engage in condomless sex for more money were associated with inconsistent condom use. Given the high disease burden among women engaged in sex work [2], strategies to promote consistent condom use and help reduce the risks of HIV among this population are critical.

In addition, findings point to the need to design programs and interventions that aim to increase availability, accessibility and promote consistent use of condoms. This could help reduce the spread of HIV in heavily impacted communities. However, such programs need to consider the cultural relevancy as well as the literacy appropriateness of the information to help bridge the knowledge gap, especially among women with low literacy levels, to gain the confidence needed in negotiating for safer sex.

Data Availability and Materials Given the sensitivity of data, the data used in the analysis of this study will not be deposited in a data repository. However, the data can be made available through the corresponding author on reasonable request.

Code Availability The statistical analysis code used is available at the request of the second author.

Declarations

Conflict of Interest All authors did not declare any competing interests.

Ethical Approval All study procedures were approved by the Washington University in St. Louis Institutional Review Board (IRB #201811106), Columbia University IRB (IRB #AAAR9804), and in-country local IRBs in Uganda, including the Uganda Virus Research Institute (UVRI #GC/127/18/10/690), and the Uganda National Council of Science and Technology (UNCST #SS4828).

Consent to Participate The research team obtained voluntary written consent from the women before participating in the study.

Consent for Publication Written informed consent was obtained from study participants to publish or disseminate their information on results as de-identified to describe the research study.

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