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Beyond an Epidemic: Examining the Syndemic Relationship between Alcohol, Violence and HIV among Youth Living in the Slums of Kampala

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Beyond an Epidemic: Examining the Syndemic Relationship between Alcohol, Violence and HIV among Youth Living in the Slums of Kampala

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Dissertation Requirement

Georgia State University, School of Public Health

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Beyond an Epidemic: Examining the syndemic relationship between of alcohol use, HIV and violence among Youth Living in the Slums of Kampala, Uganda

Abstract

Background. The HIV epidemic continues to be a major global health challenge. The interconnected relationship between HIV, alcohol use and violence contributes to an increased burden among vulnerable populations. Youth in sub-Saharan Africa are disproportionately impacted by the synergistic effects of these co-occurring conditions. However, there is limited empirical knowledge regarding the nature of these bi-directional interactions in this population. These studies aim to fill a gap in the literature by describing the mechanisms through which HIV, alcohol and violence intersect among Ugandan youth living in slums by: (1) identifying socio-cognitive correlates of sexual activity among older adolescents; (2) examining the impact of community cohesion on HIV status and related-risk behaviors and; (3) assessing alcohol consumption patterns and sexual risk behaviors among youth involved in intimate partner violence.

Methods. Secondary analyses were based on data from the 2014 Kampala Youth Survey, in which 1,137 youth aged 12- 18, living in 6 slum communities throughout Kampala, Uganda were surveyed about sociodemographic factors and various health outcomes including drinking patterns, sexual behavior, HIV status, and violence exposure. Participants were recruited, consented and interviewed by trained UYDEL staff. All respondents received a small soda and snack for their participation in the study.

Results. In study 1, after controlling for significant sociodemographic factors, older adolescent (aged 15-18 years old, n=757, males= 44%, female 56%) sexual abstainers (never had sexual intercourse) were more likely than sexually active youth to: (1) perceive HIV as a serious health

issue; (2) have positive perceptions of condom use; (3) believe that their friends planned to delay sex and; (4) be confident in their ability to avoid or refuse sex. Sexual abstinence was also associated with lower odds of reporting drunkenness. In study 2, the results (N=1,134, male=44%, female=56%) revealed that perceptions of community cohesion were significantly correlated with drinking behaviors and sexual practices. High levels of cohesion were associated with fewer sexual partners, decreased odds of engaging in transactional sex and increased odds of being a consistent condom user. High cohesion was also associated with a decreased engagement in high-risk alcohol consumption patterns, including drinking before sex and drunkenness. Finally, in study 3, youth involved in violent relationships were significantly more likely to have HIV, multiple sexual partners, engagement in transactional sex and have a partner that drinks alcohol before sex.

Conclusions and Recommendations. Results across all three studies support findings in the existing literature and also provides further evidence about the inextricable link between HIV-risk related behaviors, alcohol use and violence exposure. Future intersectional research is needed to further explicate additional factors that contribute to SAVA among adolescent populations in sub-Saharan Africa and to guide prevention and intervention efforts.

Beyond an Epidemic: Examining the Syndemic of Alcohol Use, HIV/ AIDS and Violence among Youth Living in Slums of Kampala

1.0 Background

HIV remains a leading cause of death globally. Nearly 40 million people have died from HIV- related conditions since the beginning of the epidemic (WHO, 2015). Despite the toll HIV has taken worldwide, decades of strategic prevention initiatives and policies to reduce transmission and increase access to ARTs has resulted in significant progress. In 2005, HIV-related fatality rates decreased by 35 percent and new infections by 11 percent. However, the HIV/AIDS epidemic remains a major global health challenge with a disproportionate burden impacting sub-Saharan Africa (Kaiser, 2015; WHO 2015).

For over two decades, sub-Saharan Africa has endured the brunt of the global devastation caused by the HIV epidemic (UNAID, 2014). While only comprising 13 percent of the world's population, the sub-Saharan region accounts for nearly 70 percent of the new cases of HIV annually. Youth in sub-Saharan Africa are especially vulnerable with 90 percent of HIV positive children worldwide living there (WHO, 2015; UNAID, 2014). The epidemic has also disproportionately impacted women and girls. Females residing in sub-Saharan Africa are at increased risk of contracting HIV compared to their male counterparts (Taylor, 2016). Worldwide, women represent more than 56 percent of people living with HIV. However, in Eastern and Southern Africa, HIV prevalence among young women 15 to 24 is twice the rate of that of males.

Uganda, is one of three countries in the region that is estimated to account for more than 45 percent of the HIV cases. In 2015, the country's HIV prevalence was 7 percent for adults 15 to 49 years of age and incidence was the third highest in the world (AFRO/WHO, 2017). Youth in Uganda are at increased risk of contracting HIV. Among young people, 15- 24 years of age, prevalence was estimated at 3.7 percent for women and 2.3 percent for men, with this young cohort representing the majority of new cases. Girls and young women, ages 15 to 24 years account for nearly 1 out of 4 new infections in the country. Among those ages 15 to 19 years, HIV prevalence is four times higher than for males the same ages (WHO, 2006; UN Youth, 2014).

1.1 Literature Review

In the epidemiological distribution of disease—place matters. Urban dwellers living in slum settlements are highly vulnerable to HIV. The prevalence of HIV is substantially greater among youth living in urban areas compared to those living in rural areas (UN-Habitat, 2015; Swahn, Culbreth, Salazar, Kasirye, & Seeley, 2016). Furthermore, many of the most disadvantaged urban dwellers end up in slum settlements. Overcrowding, high population density, limited access to resources, and competition for land and development resources contribute to the rampant spread and severity of HIV within slum areas (UN-Habitat, 2015).

Similar to the HIV epidemic and in the pervasive devastation that it has caused, alcohol use also contributes to a significant health burden and significantly impacts mortality and morbidity worldwide (WHO, 2006; UN Youth, 2014). Alcohol, the most widely abused substance in the world, is attributed to nearly 6 percent of global mortality (WHO, 2016). The abuse and misuse of alcohol is associated with more than 200 diseases and injuries, including

HIV/AIDS and violence (WHO, 2016). Due to its negative effects on mental health and the suppression of behavioral inhibitions and risk regulation, alcohol use has been shown to be a significant pathway to HIV transmission. Numerous studies have established its usage as a driver for the transmission of HIV and other sexually transmitted infections (STIs) as well as the severity of the disease progression in the body (CDC, 2015). Alcohol misuse has been shown to be associated with increased engagement in high-risk sex including sex without a condom and sex with multiple partners (Meyer, Springer, & Altice, 2011; Robinson, Knowlton, Gielen, & Gallo, 2016; Salas-Wright, C., Olate, R., & Vaughn, M., 20015; Salas-Wright, Reingle Gonzalez, Vaughn, Schwartz, & Jetelina, 2016). Although alcohol use is broadly associated with increased HIV-related risk behaviors, recent studies show patterns of alcohol consumption such as drunkenness to be closely associated with positive HIV status.Binge drinking, as defined by the consumption of 4 or more drinks within a single setting, is also a drinking pattern shown to be a significant risk factor for the transmission and contraction of HIV (Kalichman, Simbayi, Kaufman, Cain, & Jooste, 2007). Alcohol's bi-directional relationship with HIV transmission poses multiple pathways to heightened vulnerability. The biological implications associated with alcohol use have been shown to increase susceptibility to infection because of its diminishing effects on overall health. Studies have also shown that HIV treatment adherence can be hindered by alcohol use as well as viral load suppression (Sullivan, Messer, & Quinlivan, 2015). These factors synergistically increase the vulnerability to the transmission and acquisition of HIV as well as its treatment management among those HIV positive.

HIV transmission and alcohol use have also been closely linked with the occurrence of violence (Van de Berg, Fernandez, Fava, Operario, Rudy & Wilson, 2017). Violence is a globally pervasive problem that is varied in its forms. Interpersonal violence-related deaths

comprise a significant proportion of the world's mortality rate (Kacanek et al., n.d.; Rivera, E.

A., Phillips, H., Warshaw, C., Lyon, E., Bland, P. J., Kaewken, O., 2015;Taylor, 2016). Gender-

based violence in particular has been established as a significant pathway for the transmission of

HIV. It is estimated that nearly one third of all women worldwide experienced physical or sexual

abuse within their lifetime (Gilbert et al., 2015; Meyer et al., 2011). The high prevalence of

violence facilitates the spread of HIV, and gender- based violence has contributed to the

feminization of the HIV epidemic (Meyer et al., 2011). Sexual violence increases the likelihood

of exposure to HIV as the result of unprotected intercourse and also due to the physical trauma

that can result from rape (Gilbert et al., 2015; W. Batchelder et al., 2016). Furthermore, the threat

of physical violence or intimidation can also impact sexual practices, condom negotiation and

increase risk of engagement in unprotected sex. Additionally, albeit inconsistent, studies have

shown that having a positive HIV diagnosis is also associated with increased risk of being a

victim of violence (Gilbert et al., 2015).

Alcohol use has been closely linked to aggression, hostility and suppressed impulse

control. It can be both the catalyst and consequence of violence (Gilbert et al., 2015). The

cognitive impairment attributable to drinking not only increases the likelihood of being a

perpetrator of violence, but evidence suggests it contributes to victimization as well (Palen,

Smith, Flisher, Caldwell, & Mpofu, 2006). After experiencing, witnessing or perpetrating

violence, alcohol can be used as a coping mechanism or self-medicating tool to deal with the

residual trauma (Palen, et al, 2006). Dependence on alcohol has also been linked with

engagement in transactional sex to support the addiction, thereby further increasing the risk of

HIV and violence exposure.

The comorbidity of HIV, violence and alcohol misuse interact and increase susceptibility to the other conditions (Meyer et al., 2011). Efforts to curtail HIV transmission have largely applied unilateral approaches that do not account for its synergistic relationships with concurrent circumstances and conditions. Prevention strategies that address HIV within a silo, limit the ability to intercede at multiple pathways that contribute to HIV risk. While the current research examining the epidemiology of HIV/ AIDS is robust, there are major gaps in the knowledge regarding how it interacts with other conditions.

1.2 Examining a Syndemic Framework

The cause and proliferation of the HIV epidemic is a complex, multi-factorial crisis that is propagated by a multitude of conditions and circumstances. However, HIV prevention efforts have typically applied a biomedical concept of disease in which HIV is treated as an autonomous phenomenon that occurs in isolation from other conditions and independent from its social context. This has led to the development of intervention strategies that are limited and inadequate for addressing the intersectional nature of the disease (M. C. Singer et al., 2006, Douglas- Vail, 2015). A major limitation to the traditional epidemiological approach to epidemics is the over simplification of health outcomes as a linear process and underemphasizes the role of intersecting conditions. This reductive approach results in a limited understanding of the etiology of HIV and subsequently creates invisible barriers to improving health outcomes (Vail, 2015). The syndemic framework, however, emerged as an alternative perspective to understanding the HIV/AIDS epidemic within communities.

A syndemic is defined as a concentrated and deleterious interaction between two or more diseases or other health conditions in a population, especially as a consequence of social inequity

(Singer, 2009). According to Singer, the syndemic theory is "an explanatory framework for the analyses of disease interactions, including their origins in disease clustering, dynamics, stages of disease enhancement, and the social conditions that facilitate these processes" (Singer, 2009, pg 227). The syndemic framework is based on three primary constructs: (1) the population of interest, (2) the social-cultural context and (3) the biological synergism that connects the disease with the physical health of an individual (Douglas-Valil, 2016). Through a syndemic perspective, the HIV epidemic should be assessed with other conditions interacting with the disease to influence the strength and severity of its effects within a population.

1.2.1 Examining the SAVA syndemic

Merrill Singer (1996) first described the SAVA syndemic (substance use, violence and AIDS) in his seminal ethnographic study aimed at understanding the interconnectedness between gang violence, drug use and AIDS in an inner-city Puerto Rican community in Hartford, Connecticut. Initially, the study was designed to examine the relationship between drug use and AIDS. However, the investigation revealed that interpersonal violence was inextricably linked to both conditions. Furthermore, the disadvantaged community context exacerbated the risk of contracting HIV, abusing substances and being a victim or perpetrator of violence. Singer (1996) suggested that SAVA was best understood interdependently in the communities in which they manifest rather than as isolated occurrences.

The conceptualization of the SAVA syndemic as a framework was developed in response to the limitation of the biomedical framework to sufficiently capture the scope of the HIV/ AIDS epidemic. A primary strength of the syndemic approach to HIV/AIDS is that it expands the biological approach to provide a holistic representation of the complex network of factors that

contribute to the concentration of the disease within certain groups and populations (Douglas-Vial, 2015). In a meta- analyses of research examining the global epidemiology of SAVA among female drug users, the findings revealed a multifaceted, bi-directional relationship between gender- based violence and substance use (Gilbert et al, 2015). Additionally, the SAVA framework allows for a more nuanced understanding of the epidemiology of HIV/AIDS by clarifying multi-directional pathways with other diseases and the community conditions that contribute to the interaction (M. Singer, 2009).

A significant body of research has emerged using the SAVA syndemic framework to assess the disproportionate burden of HIV/ AIDS in high-risk populations such as Men who have sex with Men (MSM), including its relationship with mental health and other psychosocial factors. Numerous studies employ the syndemic approach to incorporate socially produced stressors, including discrimination associated with their sexual identities. MSM communities are extremely vulnerable to experiencing the synergistic effect of mental health burden, drug use and high-risk sex (Halkitis, Moeller, Siconolfi, Storholm, Solomon, Bub, 2012). Early studies into the intersectionality of substance abuse, violence and AIDS examined the phenomenon among MSM and found multiple intersections between the outcomes. Findings revealed a strong association between the relationship between AIDS and drug use. Drug use was identified as a pathway to AIDS via transmission from intravenous drug use. More specifically, sex for drugs, and a positive AIDS diagnoses also increased drug use. The SAVA syndemic framework allows for an understanding of HIV and the context that moves beyond the biological transmission of the disease and towards knowledge that clarifies the complex mechanisms that drive risks (Brennan et al., 2012; González-Guarda, Florom-Smith, & Thomas, 2011).

SAVA and Youth

Young people are highly vulnerable to the impact of the global SAVA syndemic. Over the past decade, youth have grown to comprise a significant portion of the world's population living with HIV/AIDS. In 2011, young people, age 15 to 24 years old accounted for more than 40 percent of all new HIV infections, of which nearly half were youth between the ages of 15 and 19 years old (United Nations International Children's Emergency Fund, 2016; UN Youth, 2016). To further compound this dilemma, among adolescents, sexual risking is closely associated with other risk-taking behaviors such as drinking. While consumption levels vary greatly by country, studies have shown the initiation of alcohol use during adolescence to be closely associated with alcohol misuse in the form of binge drinking and drunkenness as well as long term dependence into adulthood. Alcohol misuse is a risk factor for violence perpetration and victimization. Globally, alcohol- induced violence is estimated to contribute to nearly 20 to 30 percent of annual homicides across all age groups (WHO, 2006; UN Youth, 2014; Hawkins, et al., 1997). Among youth, harmful alcohol use has been linked to increased emotionality, impulsivity and aggression, coupled with diminished self-regulating capabilities (Hawkins, et al., 1997). These factors contribute to the increased likelihood of engaging in violent encounters (Kuhns, Hotton, Garofalo, Muldoon, Jaffe, Bouris, Schneider, 2016). Furthermore, emerging research suggests that IPV may be a common dynamic within young relationships, an aspect that is exacerbated by alcohol use (WHO, 2006). Researchers found among adolescent relationships in which at least one partner consumed alcohol the prevalence of IPV was significantly higher than those in which neither drank (Devries, 2013). Violence exposure in general is associated with substance use, often used as a coping or self-medicating tool for trauma, which can in turn increase risk of exposure to HIV through high-risk sexual behaviors. However, IPV is a direct pathway to HIV

due to exposure to unprotected intercourse and physical trauma which can increase susceptibility (Morojele, & Ramsoomar, 2016; Devries, et al., 2013). Despite the heightened SAVA syndemic risk experienced by youth, much of the literature to-date has focused on its occurrence within adult populations. The absence of the intersectional HIV research targeted at the adolescent population, has created a gaping blindside within the current knowledge, thus limiting interventions strategies to myopic, unilateral approaches to prevention. However, the steady proliferation of new HIV cases among young people suggest that current methods are not sufficient in thwarting the spread of the disease within this population. Evidence suggests the need for additional research which will elucidate the critical SAVA-related dynamics to develop multi-leveled structural interventions that address the multiple interacting factors that contribute to HIV risk among youth.

Alcohol: A critical link

The SAVA syndemic framework was conceptualized as a result of Singer observing the additively deleterious effects of the co-occurrence of substance use, HIV/AIDS and violence on disadvantaged communities. Since its inception, substance use as a component of SAVA-oriented research has broadly captured various forms of drug use, including alcohol consumption. While some syndemic studies integrate alcohol consumption behaviors into the measures for substance use, there is a substantial body of work that does not. Much of the extant literature has focused primarily on illicit drug use and its interaction with HIV and violence. Alcohol's inclusion in the SAVA framework within the broad context of substance use has resulted in a diminished understanding of the magnitude of its particular relationship with the co-occurrence of HIV and violence. Within the majority of SAVA-related research, alcohol use is

often measured through a single dimension of drinking behavior such as binge drinking, if at all. For instance, in a study to examine the syndemic effects of SAVA on viral load suppression among HIV positive women, 'binge drinking' was the only alcohol-related measure assessed, compared to six-items related to various levels of engagement with illicit drugs (Sullivan, Messer, & Quinlivan, 2015). Sullivan and colleagues relied on a single alcohol dimension when examining the SAVA impact on viral load, despite a growing body of evidence that suggest a reliable relationship between alcohol and viral suppression, as well as antiretroviral therapy (ART) adherence. Contrarily, using 10-meausres of alcohol consumption, in addition to measures for illicit drugs, Kalichman and colleagues (2014) examined ART adherence and viral suppression among HIV positive alcohol-using adults. In this study the findings revealed that among participants with non-sustained viral suppression all levels of drinking were associated with diminished outcomes including poor treatment adherence, with heavy drinking associated with the worst adherence. The results of this studies demonstrate the nuanced effects of alcohol use within the syndemic. Therefore by limiting alcohol use to a single dimension studies fail to sufficiently elucidate the multi-factorial, pathways through which SAVA is impacted by drinking. While it is without question that there is a clear need to measure the impact of illicit substances on SAVA risk, there is also convincing evidence that supports the expansion of the framework to assess alcohol use as a behavioral entity unto itself. Given the global pervasiveness and far-reaching effects of alcohol use, as well as its well-established link with both HIV and violence there is a substantial gap in knowledge regarding its particular relationship with the SAVA syndemic.

SAVA and sub-Saharan Africa

Sub-Saharan Africa has endured an unequivocal amount of the global HIV burden for over two decades. Despite declines in HIV/AIDS related-mortality the region remains the epicenter for well over half the world's annual cases (UNAIDS, 2017). Of the 6,000 new global infections occurring daily, 2 out of 3 are among adolescent girls and young women in sub-Saharan Africa, who acquired the disease 5 to 7 years earlier than their male counterparts (Kharsany, & Karim, 2016). Furthermore undiagnosed HIV remains a challenge in the region with the prevalence of undiagnosed cases significantly higher among adolescents than adults. Estimates suggest that only 9 to 13 percent of youth in the region have been tested for HIV (Lightfoot, Dunbar & Weiser, 2017). The problem of HIV in sub-Saharan Africa is further compounded by the increased prevalence of alcohol consumption in the region. Research suggests that heavy alcohol consumption and drunkenness are prevalent among vulnerable youth subgroups and closely associated with HIV transmission (Swahn, Palmier & Rogers, 2013). Throughout the years an extensive body of research has been established surrounding the epidemiology and etiology of HIV and its associated risk factors within sub-Saharan Africa. Yet, despite the abundance of research on HIV there is a stark absence of studies that apply an intersectional approach to the co-occurring conditions that interact and otherwise exacerbate the disease among sub-Saharan populations. To-date, SAVA research has primarily examined syndemic mechanisms among marginalized U.S. populations resulting in significant geographical gaps within the literature. Studies assessing the SAVA syndemic in sub-Saharan African are sparse at best. In order to advance efforts toward significantly reducing global HIV transmission, concerted efforts must be made to understand and address HIV through its intersectional relationships with alcohol and violence within sub-Saharan Africa.

The primary aims of the 3 studies were to: (1) describe HIV-related sexual risk behaviors, alcohol use patterns and violence exposure and; (2) examine the SAVA-related interactions among youth living in slums in Kampala, Uganda.

1.4 Study Overview

Study 1: Attitudes, Norms and Self- Efficacy: Examining protective socio-cognitive correlates for sexual abstinence among older Ugandan youth living in slums.

Primary aim 1: To examine protective socio-cognitive factors and drinking patterns among older adolescents, aged 16 to 18 years old living in Kampala slums.

Guiding research questions:

1. Do older adolescents that abstain from sex have different socio-cognitive attributes related to HIV/STI risk than those that are sexually active?

2. Do alcohol consumption behaviors differ between sexual abstainers and non-abstainers?

3. Is violence exposure associated with sexual activity?

Study 2: It Takes a Village: Examining the role of community cohesion on HIV status and related- risk behaviors among youth living in slums

Primary aim 2: To assess the associations between levels of perceived community cohesion and HIV- related risk behaviors and alcohol consumption patterns among youth living in Kampala slums.

Guiding research questions:

1. What correlation, if any, exists between perceptions of community cohesion and HIV status and related-sexual risk behaviors?

2. Are perceptions of community cohesion associated with drinking patterns?

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Study 3: Intimate partner violence among dating Kampala youth: Examining drinking patterns and HIV-related sexual behaviors among youth involved in IPV.

Primary aim 3: This study aims to examine the drinking patterns, and identify HIV prevalence and related sexual behaviors among youth involved in violent intimate partner relationships.

Guiding research questions:

1. Are there drinking patterns associated with being involved in a violent relationships;

2. Does IPV involvement influence HIV and STI risk and;

3. Do sexual practices differ between youth involved and not involved in violent romantic partnership?

Study Rationale

While there is a growing body of research examining the syndemic relationship between HIV, alcohol use and violence these studies have primarily targeted marginalized U.S. populations, including the urban poor, women, African- Americans and Latinos, as well as MSM and transgender people (Brennan et al., 2012; González-Guarda et al., 2011; Illangasekare, Burke, Chander, & Gielen, 2013; W. Batchelder et al., 2016; Wilson et al., 2014). However, integrated research that examines the bi-directional intersectionality between HIV risk and the co-occurrence of violence and alcohol is woefully underexplored among youth in sub-Saharan Africa.. Understanding the synergistic mechanism through the SAVA conditions that interact within this high- risk population will better inform the development of multi-faceted, structural interventions needed to prevent HIV transmission. This research aims to benefit those interested in the etiology of the SAVA syndemic, as well as those interested in designing evidence-based, and integrated HIV- prevention strategies.

2.0 Methodology Overview

Data for all 3 papers were derived from the 2014 Kampala Youth Survey, a cross-sectional study of a convenience sample of disadvantaged youth, 12 to 18 years of age, living in slum communities across Kampala, Uganda. The primary aim of the survey was to assess alcohol use, violence, sexual risk behaviors and HIV prevalence. Participants were recruited from youth present around one of the Ugandan Youth Development Link (UYDEL) drop- in centers on the day surveys were administered.

Located in 6 urban slum communities across Kampala, UYDEL provides vocational training, sexual health services, and mental health counseling to homeless youth, and those living in slums. At the time of this study, organization- wide UYDEL provided services to approximately 650 youth per month and even more youth through outreach programs. Study recruitment occurred while youth were engaging in community outreach activities in the neighborhoods surrounding the drop-in centers.

2.1 Data collection and participants

Data were collected between April and May of 2014. During this period 1,628 youth age 12 to 18 were solicited for participation, primarily through word- of-mouth. Of those recruited 92 percent consented to participate while 131 declined, yielding a total of 1,497 surveys collected. Three hundred and twenty surveys were lost due to technical issues with the software server resulting in a final sample of 1,134 surveys, which included 43 pilot cases. Surveys were administered to the participants using Google Nexus 7 tablets with the Qualtrics survey software (Qualtrics, Provo, UT, USA).

Survey questions were translated from English into Luganda (the most common local language in the region) by a certified translator and back-translated for accuracy. During

administration participants were asked their language preference and the survey was administered accordingly. Trained UYDEL community health workers administered surveys through in- person interviews lasting 20–30 minutes following proper consent protocols. Parental consent was waived for youth ages 12–17 within this context due to the following Ugandan statutes regarding consent: (1) Minors who provide and tend to their own livelihood are considered emancipated at age 14; (2) HIV testing can be performed without parental consent as early as 12 years old; and (3) with the high prevalence of orphaned or "abandoned" youth, UYDEL was considered a custodial proxy acting in the best interest of the children. Participants received a small snack and a drink (juice or soda) as incentive for participating in the survey. All included participants provided informed consent for their inclusion in the study. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Institutional Review Board at Georgia State University (H14101) and the Uganda National Council on Science and Technology (SS3338).

The Kampala Youth Survey was based on measures previously validated in the United States and globally including: the Youth Behavioral Risk Surveillance Survey (YBRSS), Global Health Youth Survey(GHS), Kampala Youth Survey 2011, US AID Survey, MAMPA 2012 Questionnaire, AUDIT Self-Report Version, CAGE Questionnaire, iMPPACS, AIDS Indicator Survey and the National Teen Pregnancy Survey. The survey included both multiple choice and open ended questions. The items queried participants on a variety of demographic and health – related issues including sociodemographic characteristics, familial structure, sexual activity, alcohol use, violence involved drinking behaviors, exposure to alcohol marketing, HIV knowledge, sex- related practices and beliefs, exposure to violence and community perceptions.

Interviewers received a one-day training on consent procedures, survey administration protocols and the use of the tablet. As part of the training, staff were instructed, per the protocol, to read the survey questions exactly as they appeared on the tablet screen after obtaining consent from the participants. Tablets were programmed to notify the interviewers of any missed questions and also processed skip patterns automatically for more accurate and expedient data collection. The use of the electronic tablets in this project made the survey administration more timely and effective and afforded the researchers a larger sample than in the previous 2011 Kampala Youth Survey (Swahn, Braunstein, Palmier, Kasirye, Yao, 2014). Interviewers were also assigned a unique identifier to be used over the course of the survey administration to ensure data quality and protocol fidelity.

3.0 Analyses Overview

Each of the three studies include descriptive analyses of all study variables. Briefly, bivariate analyses were conducted to assess between group differences. Binominal and multinominal logistics models were used to examine relationships between the independent and dependent variables. All models controlled for significant covariates. Analyses were conducted using IBM SPSS Statistics 23.

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Attitudes, Norms and Self- Efficacy: Examining protective socio- cognitive correlates for sexual abstinence among older Ugandan youth living in the slums of Kampala, Uganda

1.0 Introduction

Adolescence is an important period during the life course, typically associated with significant physical, emotional and mental development. Social experimentation and risk tasking are characteristics of this transitional period. Risk-taking behaviors during this period include early sexual debut, unprotected sex and substance use (Epstein, Bailey, Manhart, Hill, Hawkins, et al., 2014; Lammers, Ireland, Resnick, & Blum, 2000; Leerlooijer, 2014). Studies have shown that behaviors acquired in adolescence can impact short- and long-term health outcomes across the lifespan (Epstein, Manhart, Hill, Bailey, Hawkins, Haggerty & Catalono, 2014;Salas-Wright, Reingle Gonzalez, Vaughn, Schwartz, & Jetelina, 2016). Adolescent propensity towards high-risk behaviors contributes to the age disparities in the global HIV prevalence, particularly within sub-Saharan Africa. In Uganda, the HIV prevalence for people 15 to 24 years of age is 3 percent (WHO/ AFRO, 2016; Marston, Beguy, Kabiro, & Cleland, 2013).

While sexual debut is a normal component of human development, studies have shown that early sexual initiation is a significant risk factor for negative psychosocial effects, engagement in HIV-related risk behaviors and non-consensual sexual encounters (Bersamin, Fisher, Walker, Hill, & Grube, 2007; Lammers et al., 2000). A national study of South African adolescents found that youth who engaged in sex during early adolescence, before age 16, were twice as likely to report concurrent sexual partnerships and less likely to use condoms compared

to those that debuted at later ages (Khangelani, Geofrey, Thabile, Thembile, Thomas, & Ntombizodwa, 2010). Early engagement in sex was also associated with other high-risk behaviors such as tobacco use, drug use, drinking before sex and drunkenness (Buhi & Goodson, 2007). Younger ages at sexual debut have also been found to be associated with engagement in more advanced sexual practices such as anal, oral and group sex, more lifetime sexual partners and an increased risk of contracting sexually transmitted infections. Adolescent girls that initiate sex early fare worse still, than their male counterparts (Kalolo & Kibusi, 2015; Salas-Wright et al., 2016). Girls were found to be significantly less likely to use a condom upon sexual debut and at greater risk for contracting a STI compared to boys. Gender disparities in HIV-related risk in this age group are due in part to the increased likelihood that adolescent girls typically will have older, more experienced sexual partners, compared to boys. The older and more sexually experienced partners are more likely to have been exposed to HIV and to other STIs through unprotected sex, which then may be passed on to adolescent girls (Bell, Bhana, Peterson, McKay, Gibbons, Bannon, Amatya, 2008; Cort, Ramirez, & Chama, 2016). The threat of violence is a risk for both males and females that initiate sex early. However, girls are at an increased risk of experiencing gender-based violence (Leerlooijer et al., 2014; Sommer, Likindikoki, & Kaaya, 2015;Marston et al., 2013; Sandfort, Orr, Hirsch, & Santelli, 2008).

Early sexual debut has been identified as an important factor in HIV-related risk behavior. Research demonstrates that alcohol and drug use during adolescence are risk factors for early sexual activity (Eggers et al., 2017). Conversely, academic success and strength of parental relationship, particularly maternal communication and openness are important protective factors associated with the delay of sex (Bell et al., 2008; Ott, Pfeiffer, & Fortenberry, 2006).

Numerous studies have examined the correlates of high risk sexual behaviors among adolescents (Epstein, Bailey, Manhart, Hill, & Hawkins;Taffa, Klepp, Sundby & Bjune, 2002). In a systematic review of 115 published studies on the salient predictors of adolescent sexual behavior and intentions, Buhi and colleagues (2016) categorized the findings into 8 overarching constructs: 1) intentions, 2) environmental constraints, 3) skills, 4) attitude, 5) social normative pressure, 6) consistency, 7) emotional reactions and 8) confidence. The results of the review revealed that across studies intentions and perceived norms were the most stable predictors of sexual behaviors in adolescents. Both were found to be consistently associated with sexual activity and risk taking (Cort et al., 2016; Iriyama, Nakahara, Jimba, Ichikawa, & Wakai, 2007). Perceptions of peer and parental attitudes towards sex were most predictive of sexual intentions and activity across studies. Other perceptions of peer norms and attitudes were found to be less consistent correlates (Cort et al., 2016; Kalolo & Kibusi, 2015; Lammers et al., 2000; Ott et al., 2006). However, a primary limitation of this review, is its focus solely on populations in the United States. Presently, there remains a paucity of knowledge regarding the protective factors for sexual activity among adolescents in sub-Saharan Africa (Long-Middleton et al., 2013).

1.1 Theoretical Framework

The guiding theoretical framework for this study was based on the Integrative Behavioral Model (IBM), which aims to identify the construct and logic streams associated with health behaviors. IBM has been used to successfully predict condom use and HIV/ STD related prevention behaviors among diverse populations. Much like the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB), IBM places significant weight on the importance of intentions in creating behavioral change. The model further asserts that intentions

and behaviors are primarily driven by three constructs: (1) attitudes, (2) perceived norms, and (3) personal agency. Each of the constructs include two respective sub-constructs.

The first construct, attitude, broadly measures a person's overall feeling towards a behavior or course of action and includes the sub- constructs, experimental attitude and instrumental attitude (Montano & Kasprzyk, 2016). Experimental attitude is the emotional response associated with performing a particular behavior or task. Experiencing negative emotions in response to a behavior decreases the likelihood that it will be performed. Conversely, experiencing strong positive feelings about a particular course of action can increase the likelihood of persons performing certain behaviors (Dittus & Jaccard, 2000). Beliefs and ideas about the outcomes of performing particular behaviors are described as instrumental attitudes. This sub-construct is knowledge based and describes beliefs about the outcomes of performing a behavior.

The second construct, perceived norms, is based on the perceived social acceptability of a behavior. Perceived norms reflect the desirability of a particular behavior based on the social pressures felt to perform or not perform a task. The perceived norm construct includes both injunctive norms and descriptive norms. Injunctive norms are beliefs about what those within one's social and personal network think one should do, while descriptive norms, assess perceptions about what others are doing (Buhi & Goodson, 2007; Leerlooijer et al., 2014).

The third and final construct, personal agency, measures personal control and self-efficacy. This construct reflects the amount of perceived control and abilities an individual feels they have to perform a task in the midst of their environment. If perceived control is high, then there is a strong likelihood that the person will subsequently believe they can perform a behavior. Self-efficacy, conversely, is a measurement of one's confidence in their ability to accomplish a

task in spite of challenges and obstacles (Epstein, Bailey, Manhart, Hill, & Hawkins, 2014) (Mathews, Aaro, Flisher, Mukoma, Wubs, & Schaalma, 2009).

The Integrated Behavioral Model (IBM) constructs are reflections of an individual's underlying beliefs. This theoretical model asserts that the stronger the belief that performing a particular behavior will lead to a positive outcome and reduce the likelihood of negative outcome, the more likely favorable beliefs will develop and increase the likelihood of performing the task.

Studies have examined predictors for high-risk sexual behaviors among youth, however, there remains a dearth of knowledge surrounding the factors associated with delayed sexual initiation among older adolescents. Research examining correlates for protective behaviors such as delayed sexual initiation and abstinence particularly among sub- Saharan youth is substantially limited.

1.2 Study Aims

This study aims to identify the potentially protective socio-cognitive factors for sexual abstinence such as HIV-related attitudes, norms, intentions and self-efficacy, as well as drinking patterns and violence exposure among older primary abstainers, ages 16 to 18 years. The guiding research questions were threefold: (1) do older adolescents that abstain from sex have different socio-cognitive attributes regarding HIV/STI- related risk than those that are sexually active; (2) do alcohol consumption behaviors differ between abstainers and non-abstainers; and (3) is violence exposure a predictor for sexual activity?

The study hypothesis asserts that attitudes, norms and intentions that encourage safer sex practices and reduce risk of HIV would be protective for sexual activity and significantly associated with sexual abstinence.

2.0 Methods

Data were derived from the 2014 Kampala Youth Survey, a cross-sectional study of disadvantaged youth, ages 12 to 18 years of age (N=1134), living in slum communities across Kampala, Uganda. The primary aim of the survey was to assess alcohol use, violence, sexual risk behaviors and HIV. Participants were recruited from youth present around one of the Ugandan Youth Development Link (UYDEL) drop- in centers on the day of recruitment.

Located in 6 urban slum communities across Kampala, UYDEL provides vocational training, sexual health services, and mental health counseling to homeless youth, and those living in slums. At the time of this study, organization- wide UYDEL provided services to approximately 650 youth per month and even more youth through outreach programs. Study recruitment occurred while youth were engaging in community outreach activities in the neighborhoods surrounding the drop-in centers.

2.1 Data collection and participants

Data were collected between April and May of 2014. During this period 1,628 youth age 12 to 18 were solicited for participation, primarily through word- of-mouth. Of those recruited 92 percent consented to participate while 131 declined, yielding a total of 1,497 surveys collected. Three hundred and twenty surveys were lost due to technical issues with the software server resulting in a final sample of 1,134 surveys, which included 43 pilot cases. Surveys were

administered to the participants using Google Nexus 7 tablets with the Qualtrics survey software (Qualtrics, Provo, UT, USA).

For the purposes of this study inclusion was limited to participants ages 16-18 at the time of the survey administration, 43.8% males (n= 333) and 56.1% female (n=427). The mean age of sample participants was $17.24 \pm .779$. Response to the outcome variable and sexual activity was required for inclusion in the study. All respondents reported identifying with a religion, although it must be noted there was no option for "none" listed. Christianity, Islam, and traditional Religions accounted for 68.9%, 24.8% and 1.97%, respectively. Different categories of Christianity were combined to include "Catholic" denomination as well as "other" denominations of Christianity. Sexual abstainers comprised 39% (n=297) of the respondents, while non-abstainers, those that reported having had sex at least once, accounted for 60.6 % (n=461). Two participants were excluded due to lack of response to the dependent variable (N=758).

Survey questions were translated from English into Luganda (the most common local language in the region) by a certified translator and back-translated for accuracy. During administration participants were asked their language preference and the survey was administered accordingly. Trained UYDEL community health workers administered surveys through in-person interviews lasting 20–30 minutes following proper consent protocols. Parental consent was waived for youth ages 12–17 within this context due to the following Ugandan statutes regarding consent: (1) Minors who provide and tend to their own livelihood are considered emancipated at age 14; (2) HIV testing can be performed without parental consent as early as 12 years old; and (3) with the high prevalence of orphaned or "abandoned" youth, UYDEL was considered a custodial proxy acting in the best interest of the children. Participants

received a small snack and a drink (juice or soda) as incentive for participating in the survey. All included participants provided informed consent for their inclusion in the study. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Institutional Review Board at Georgia State University (H14101) and the Uganda National Council on Science and Technology (SS3338).

The Kampala Youth Survey was based on measures previously validated in the United States and globally including: the Youth Behavioral Risk Surveillance Survey (YBRSS), Global Health Youth Survey(GHS), Kampala Youth Survey 2011, US AID Survey, MAMPA 2012 Questionnaire, AUDIT Self-Report Version, CAGE Questionnaire, iMPPACS, AIDS Indicator Survey and the National Teen Pregnancy Survey. The survey included both multiple choice and open ended questions. The items queried participants on a variety of demographic and health – related issues including sociodemographic characteristics, familial structure and sexual activity and alcohol use, violence involvement drinking behaviors, exposure to alcohol marketing, HIV knowledge, sex- related practices and beliefs, exposure to violence and community perceptions.

Interviewers received a one-day training on consent procedures, survey administration protocols and the use of the tablet. As a part of the training, staff were instructed, as part of the protocols, to read the survey questions exactly as they appeared on the tablet screen after obtaining consent from the participants. Tablets were programmed to notify the interviewers of any missed questions and also processed skip patterns automatically for more accurate data collection. The use of the electronic tablets in this project made the survey administration more timely and effective and afforded the researchers a larger sample than in the 2011 Kampala Youth Survey. Interviewers were also assigned a unique identifier to be used over the course of the survey administration to ensure data quality and protocol fidelity.

2.2 Measures

Participants self-reported their age, sex, and education level as well as indicators for socioeconomic status. Along with the educational variables, type of housing structure, housing materials, experience with homelessness, orphan hood and access to electricity, mobile phone, television and radio were used to create a socioeconomic status score. The composite score ranged from 1 to 10, with higher scores being associated with higher levels of socioeconomic status and access within the context. Wealth quartiles were used to rank socioeconomic status scores.

Dependent variable. Sexual activity status was the outcome variable of interest. Respondents were categorized into a dichotomous variable for sexual status: 'abstainers' or 'non-abstainers'. In the context of this study sexual intercourse was defined and explained to participants as 'a penis entering a vagina'. Abstainers were participants that reported never having engaged in sexual intercourse as defined by a 'no' response to the survey question 'have you ever had sexual intercourse'. Respondents that responded 'yes' to either 'ever having engaged in sexual intercourse' or to the having had sex in the past year were defined as non-abstainers. Abstainers that reported having been raped or forced to have sex were excluded from the analyses. Participants that did not responded to the sexual status variable, "have you ever had sexual intercourse" were also excluded from the study.

Independent variables. The primary independent variables for sexual activity were: (1) HIV- related attitudes (2) perceived norms; (3) intentions and (4) self-efficacy.
Instrumental and Experimental Attitudes. Numerous studies have cited attitudes and beliefs as significant predictors for sexual activity among U.S adolescents. However, the specific attitudes associated with abstinence among sub-Saharan youth is under explored. In this study HIV-

related attitudes and beliefs were assessed using 5 items: 'condoms take away pleasure'; 'girls can suggest condoms', 'HIV is serious health issue', 'condoms prevent pregnancy' and "I have other ways to express love". Responses were coded as a binary, 'yes' or 'no'.

Perceived Norms. In previous research both perceived peer approval of sex and parental disapproval were consistently associated with sexual status (Buhi, et al 2007). In this study perceived norms of sex were measured using 5-items to assess perceived acceptability of sexual behaviors by peers and family. Normative measures queried participants on their perceptions of their peers and parents' feelings related to sexual behaviors as well as their personal beliefs about sexual behaviors. Responses for "agree" were coded as "0/yes" and "disagree" was coded as "1/ no". Responses of "neither agreeing nor disagreeing" were excluded from the analyses.

Self-efficacy and Intentions. Self- efficacy and intentions have been shown to interact and predict numerous high-risk behaviors. Self-efficacy to engage in protective behaviors such as abstinence were measured using 3 items: (1) 'I am able to avoid situations that may encourage me to have sex'; (2) 'I am able to refuse to have sex with my boyfriend/girlfriend if I did not feel like having sex' and (3) 'I am able to use a condom correctly'.

Sexual intentions to engage in HIV-related risk behaviors were measured using 2-items: (1) 'I plan to have sex within the next six months', and (2) 'I plan to use a condom when I have sexual intercourse'. For both self-efficacy and intentions questions participants could respond either, 'agree', 'neutral' or 'disagree'. Neutral responses were excludes from analyses.

Alcohol Use. Alcohol use and associated behaviors were assessed using five items which measured current drinking status and subsequent drinking patterns including frequency of use, intensity of drinking, drunkenness and binge drinking. For the purpose of this study, current drinkers are defined as those reporting having had a full drink of alcohol within the survey year.

Additionally, respondents that reported drinking alcohol '4 times a month or less', were defined as 'occasional' drinkers, those drinking two to three times per week were defined as frequent drinkers, while those that reported drinking 4 or more times per week were defined as 'heavy' drinkers. To measure drinking intensity participants were asked when consuming alcohol how many full drinks did they typically consume in a day. Responses were dichotomized as either'1-2' or '3 or more'. Binge drinking has been shown to be significantly associated with high risk sexual behaviors among adolescents. Study respondents were asked how many times, if any, in the past month they had five or more drinks during one occasion. Participants that reported having five or more drinks in a row, during on at least one occasion during the month, were defined as binge drinkers. Those reporting not drinking five consecutive drinks in one sitting on any days were defined as non- binge drinkers.

Violence. Respondents were asked about their exposure to 2 forms of violence: parental and intimate partner violence. For the purposes of this study participants reporting having been beaten by their parents to the extent that bruises or marks were left, were identified as an affirmative exposure to parental violence. Intimate partner exposure was defined as reporting yes to having been physically harmed by a boyfriend or girlfriend.

Data Analysis

Frequencies, distribution statistics and Pearson chi- square were calculated for all study variables and the associations between sexual activity status and sex-related attitudes, perceived norms, self-efficacy and intentions, as well as drinking behaviors and violence exposure. Binominal logistic regression models were analyzed to examine the adjusted associations

between the outcome variables and the explanatory variables. All analyses were conducted using SPSS software, version 24.0.

3.0 Results

3.1. Univariate analyses

The demographic profile of adolescents by sexual activity are presented in Table 1. Analyses were limited to older adolescents, ages 16-18 years. There was no significant gender differences between the abstainers and non- abstainers. On average, sexual abstainers were slightly younger than non-abstainers. The mean age for abstainers was 17.07, compared to the average age of 17.35 for their sexually active counterparts. There were no significant differences in religious identity or educational status between groups. However, sexual abstainers on average reported significantly less homelessness, less orphan hood and fewer romantic relationships.

3.2. Socio-cognitive- bivariate analyses

Bivariate correlations for socio-cognitive variables by sexual activity status are presented in Table 2. Chi- square test revealed abstainers expressed less confidence in their ability to express love to their boyfriends and girlfriends than non-abstainers. Abstainers also expressed more favorable attitudes towards condoms. Only 39.1% of abstainers responded that condoms take away sexual pleasure when compared to 61.7% of non-abstainers. Sexually active youth were significantly more likely to not believe that it is okay for a girl to suggest condom use to a sexual partner compared to abstainers. More than 90% of both abstainers and non-abstainers perceived condoms as an effective form of contraception. Abstainers were more likely than non-abstainers to have friends that planned to delay sex until they were older (76.3% vs. 46.0%;

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p=<.001); and believe that their friends supported them not having sex (76.3% vs. 46.0%; p=<.001). Non-abstainers were 1.5 times more likely than abstainers to hold injunctive norms that suggests that their friends did not support them abstaining from sex. Ninety- three percent of abstainers reported that the adults in their lives did not agree with people their age having sex. The perceived adult disapproval of sex was significantly lower among those that had reported being sexually active. Similarly, nearly all abstainers (98%) believed that their parents would be upset if they found out they were having sex, compared to the 86 percent of non-abstainers who shared that belief. Additionally, more abstainers (62.5%) than non-abstainers (56.3%) believed that their parents would support them carrying a condom if they planned to have sex but the difference was not statistically significant. Only 19.3 percent of sexual abstainers reported that they intended to have sex in the 6 months following the survey, compared to 75.5 percent of non-abstainers.

3.2. Intentions and self-efficacy- bivariate analyses

More sexual abstainers reported intending to use condoms when they have sex compared to those that were sexually active. However, the difference between groups were not statistically significant. Confidence in the ability to avoid situations that encouraged sex was significantly higher among the abstainers compared to non-abstainers (95.5 percent vs. 89.6 percent respectively). Both abstainers and non-abstainers felt similarly confident in their ability to refuse sex with their partners if they did not feel like it (93.2% and 93.5% respectively).

3.3 Alcohol use and violence exposure- bivariate analyses

Other demographic characteristics did not significantly differ by sexual status. Less than 20 percent of sexual abstainers reported drinking alcohol within the 12 months prior to the

survey compared to the more than half of non-abstainers (p=<.001). Sexual abstainers also were 67 percent less likely to be current drinkers than sexually active youth. Sexually active youth were significantly more likely to report being drunk (OR 3.25; 95% CI .1.29-8.16; p=.012) compared to sexually active youth. However, there was no significant difference between the risk and distribution of binge drinking between groups.

3.4 Binomial logistic regression

Binomial logistic regression models were used to assess the relationship between the sexual activity status and the independent variables. Table 3 summarizes the results of the analyses. Based on the bivariate analysis, significant socio-demographic variables were loaded into the binominal logistic regression model. Although gender showed no significant bivariate correlation it was placed into the regression model based on previous studies finding gender to be significant correlate for sexual activity. Age, gender, education, experience with homelessness, living parentage and phone ownership were entered into the model. When adjusted for the effects of other demographic factors, having both living parents, and owning a cell phone was significantly associated with sexual activity. Much of the results of the binomial regression analyses supported the bivariate findings. The model revealed no significant associations between sexual activity and age and phone ownership. However, gender became significant when included into the model.

When analyzing the effect size of attitudes, controlling for gender, age, having a relationship, homelessness and phone ownership; sexual abstainers were more likely to believe HIV was a serious health issue, and view condom use more favorably compared to sexually active youth. The model correctly predicted 79.8 percent of the cases. Based on Nagelkerke $R^{2,}$ adjusting the model for demographic characteristic, attitudes predicted 40% of the variability

between abstainers and non-abstainers. However, abstainers were significantly less likely to feel confident in their ability to show love without sex. Having friends that planned to have sex was associated with a 2.31 (p= .014; 95% CI=1.18- 4.55) greater likelihood of being sexually active than those with friends who did not plan on having sex. Youth who believed that their parents would be upset about them being sexually active were significantly less likely to be sexually active when compared to those who believed their parents would not be upset (0R=0.166; p= .009; 95% CI=.043 - .063). Norms suggesting that friends and adults do not support participants having sex were not significantly correlated with sexual status. The model for perceived norms accounted for 44.8 percent (Nagelkerke R^2) of the variance in sexual activity.

Sexual abstainers were also more likely to report parents being upset about sexual activity. The model for sex-related efficacy explained 35 percent (Nagelkerke R^2) of the variance in sexual activity and correctly classified 83 percent of the cases. Confirming the bivariate analysis, feeling able to avoid, or refuse sex was associated with increased odds of a being a sexual abstainer. However, reporting not knowing how to use a condom was five times higher among the sexually abstinent. Intentions accounted for 50 percent of the variance (Nagelkerke $R^{2,)}$, with abstainers 7 times more likely to intend on abstaining from sex.

A binominal model with sexual activity status and drinking behaviors adjusted for covariates revealed the odds of reporting drunkenness was significantly lower among sexual abstainers. Current drinking status fell out of the model as insignificant. The model explained 20% (Nagelkerke R^2) of the variance in sexual activity and correctly classified 84.7% of the cases. When controlled for confounding interactions neither parental violence nor intimate partner violence significantly predicted sexual activity.

4.0 Discussion

The primary aim of this study was to assess the potentially protective correlates associated with sexual abstinence among older high-risk adolescents. The study hypotheses asserted that there would be significant differences in the HIV-related attitudes, norms, self-efficacy and intentions between sexual abstainers and non- abstainers. Drinking behaviors and violence exposure were hypothesized to be significantly lower among sexual abstainers.

Study findings revealed that sexual abstainers were different from non-abstainers in key areas. In general, being male, not having a relationship, not experiencing homelessness and having at least 1 living parent was protective for sexual activity. Surprisingly, asset- related measures were not significantly correlated with sexual activity when controlled for other factors. The results also revealed when controlled for significant co-variates, HIV-related experimental and instrumental attitudes did predict sexual status. Positive attitudes towards condom use were more closely associated with sexual abstinence than by being sexually active. Furthermore, believing HIV was a serious issue for people in their age group was associated with sexual abstinence.

This study examined the associations between perceived norms and sexual status among older adolescents. The models revealed significant normative perceptions as correlates for sexual activity among adolescents. The descriptive norms associated with believing that their friends did not have intentions to have sex served as a salient protective factors for sexual abstinence. Similarly, parental injunctive norms regarding disapproval of sex were also found to protect against sexual activity. Sexual abstainers were more likely than their sexually active peers to believe that their parents disapproved of them engaging in sex. These findings confirm the results of previous studies that established perceived norms, particularly as they relate to peer

norms and parental approval as strong predictors of sexual activity status (Buhi & Goodson, 2007). However, the fact that injunctive norms about how their peers believed they should behave were not correlate to sexual activity, nor was general adult discouragement. This is a bit surprising because although there is variability in the literature, perceptions about what peers think was generally found as a strong predictor of behavior (Buhi & Goodson, 2007; Ott et al., 2006). However, these findings suggest that the reliability of normative perceptions as correlates for sexual activity depend largely on the specific norm.

The results further affirmed that sexual intentions and efficacy were highly correlated with sexual status. The statistical models revealed that this relationship accounted for nearly 50% of the variance between groups when controlled for sociodemographic characteristics. Consistent with previous findings, sexually active youth were more likely to plan to have sex in the future (Buhi & Goodson, 2007). However, abstainers reported higher levels of confidence in their ability to control their sexual experiences and exposure than their sexually active counterparts. These findings were especially surprising considering one might expect individuals with more sexual experience to feel more empowered and in control of their sexuality in a way that less experienced person might find intimidating or frightening. Alternatively, the abstainers confidence in controlling environments or circumstance that encourage sex may be due to the types of personalities or personal beliefs held by older adolescent that abstain from sex. Their confidence in their ability to manage their environment or exposure to a setting that may encourage sex may be informed by personal convictions that motivates them to deliberately delay sexual initiation and in doing so they may deliberately avoid settings and circumstances that may challenge that practice.

The limited self-efficacy expressed by non-abstaining adolescents in their ability to avoid and refuse sexual encounters was particularly alarming (Ott et al., 2006). The lack of confidence in this area may be reflective of feelings of limited agency to control sex and the circumstances surrounding it. Such limited agency could influence their perceived ability to negotiate sexual engagement or condom use placing them at increased risk for partaking in unprotected sex and other risky behaviors. This could also increase vulnerability to sexual victimization. To the best of our knowledge, little to no research has specifically examined self-efficacy and safe sex competencies among the sexually abstinent adolescents in sub-Saharan Africa.

In spite of youth expressing confidence in the ability to control the circumstance surrounding sex, sexual abstainers also reported feeling significantly less capable of using alternative, non-sexual means of showing affection to their partners, than those that were sexually active. Results show that abstainers were less likely to have partners and were also more likely to be able to avoid circumstances that encourage sex. This may be attributable to the fact that abstainers are less likely to be dating, and thus less likely to be in a relationship in which sex could be expected. Subsequently, abstainers, due to limited experience in romantic relationships may not have developed strategies with which to demonstrate affection in a non-sexual manner. This finding is particularly disturbing because besides avoiding relationships, abstainers seem to lack the skills to negotiate sex or delay it within the boundaries of a romantic relationship (Eggers et al., 2017). Thereby, in the event that they should become romantically involved, they may feel pressured to initiate sex due to a lack of alternative options and without the necessary skills to do so in the safest manner possible (Leerlooijer et al., 2014).

Lastly, alcohol use and violence exposure were expected to be significantly different between abstainers and non-abstainers. However, the results of the regression model revealed

fewer differences between sexual abstainer and non-abstainers. Drinking status did not

significantly predict sexual activity, nor did binge drinking. Although, it was unexpected that

drinking levels did not differ between abstainers and non- abstainers, more surprising still is that

binge drinking was not correlated with sexual activity. Studies have shown that 'binge drinking'

is associated with sexual risk-taking behaviors. However, within this study, experience with

drunkenness was found to be a reliable predictor of sexual status. This finding suggests that older

Ugandan adolescents may largely engage in similar drinking behaviors irrespective of sexual

activity status. However, among those that do consume alcohol and subsequently get drunk, they

were also more likely to be sexually active.

Regarding the violence predictors, it was expected that there would be significant

difference in exposure between groups. Nonetheless, after controlling for the effects of

sociodemographic characteristics there were no differences between exposure to parental

violence or intimate partner violence between sexual abstainers and non-abstainers. There is a

limited body of work related to the role of parental violence in predicting sexual behaviors

among adolescents, particularly in sub-Saharan Africa. Childhood trauma in the form of neglect,

lack of parental monitoring, and violence have been shown to be associated with risk-taking

behavior (Gorman-Smith, Henry, & Tolan, 2004; Leerlooijer et al., 2014). However, this

relationship is not consistent across studies. The results of this study add to the body of work

around correlates associated with sexual behavior among high risk youth in sub-Saharan Africa,

an under studied area of research given the scope of the AIDS epidemic on the African continent.

4.1 Limitations

There were a number of limitations that should be considered when interpreting the

findings. Most importantly, this study uses cross-sectional data which does not allow for the

assessment of how attitudes, perceptions, self-efficacy and intentions and subsequently sexual behaviors change over time. While many of the socio-cognitive factors were shown to be significant correlates for sexual activity, studies have shown that these factors are not static but rather change over time (Eggers et al., 2017). Another limitation was based on the definition of 'abstainers' and 'non-abstainers'. Although abstainers were participants that reported never having had sexual intercourse, the 'non-abstainer' distinction included all respondents that reported ever having had sex during their lifetime, including those that reported not being active in the past 12 months. Initial preliminary analyses were conducted to examine significant difference between primary abstainers (never had sex), secondary abstainers (had sex but not active in the preceding 12 months) and sexually active older adolescents, and there were marginal, if any, difference between secondary abstainers and sexually active respondents. As such, the decision was made to collate the groups. However, further analyses may have revealed latent differences between groups. Another limitation was that the survey did not include measures that assessed the intentionality of abstinence or motivation for sexual activity or abstinence. As a result, inferences had to be made regarding the reasons behind sexual abstinence.

4.2. Conclusions and Recommendations

The results of this study serve to further inform the current body of literature on protective factors for sexual activity and HIV-risk among youth in sub-Saharan Africa. Understanding the socio-cognitive predictors for early sexual activity provides opportunities for the development of HIV prevention strategies that encourage the delay of sexual debut. Additionally, it illustrates the need to have general programming strategies that engage both sexually active and inactive youth as they can potentially all be at risk in the future. Additional

studies are also needed to further examine the trajectory of the socio-cognitive protective

correlates for sexual abstinence and other behaviors to assess how they change across time.

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Table 1. Distribution of socio-demographic characteristics stratified by sexual status among youth in the slums of Kampala (N= 757)

		Sexual Abstainers	Sexually Active	p-value
Mean Age (Years)	Boys	17.06	17.42	<.001
	Girls	17.09	17.29	.011
		N (%)	N (%)	
Gender	Boy	135 (45.6)	195 (42.3)	
	Girl	161 (54.4)	266 (57.7)	.206
Age	16 years	83 (27.9)	78 (16.9)	
	17 years	108 (36.4)	145 (31.5)	
	18 years	106 (35.7)	238 (51.6)	<.001
Ever Homeless	Yes	41 (13.9)	136 (29.5)	
	No	255 (86.1)	325 (70.5)	<.001
Religion	Christian- Catholic	101 (34.0)	169 (36.7)	
	Christian- Other Denomination	87 (29.3)	166 (36.0)	
	Muslim	86 (29.0)	102 (22.1)	
	Traditional Religion	6 (2.0)	9 (2.0)	
	Other	17 (5.7)	15 (3.3)	.066
Have boyfriend/girlfriend	Yes	117(39.5)	397(86.3)	
	No	179 (60.5)	63(13.7)	<.001
Education	Never attended	12(4.0)	28 (6.2)	
	Some/completed Primary	120 (40.4)	201 (44.2)	
	Some/completed Secondary	156(52.5)	219(48.1)	
	More than Secondary	9 (3.0)	7 (1.5)	.197
Number of Rooms of Sleeping	1	109 (37.3)	197(43.9)	
	2	98 (33.6)	151(33.6)	
	More than 2	85 (29.1)	101(22.5)	.085
Roof Materials	Thatch/straw	3 (1.0)	10(2.2)	
	Iron sheets	291 (98.3)	439 (97.1)	
	Tiles	2 (0.7)	3 (0.7)	.471
Parents alive	Both living	136(45.8)	162	

			(35.1)	
	One living	101(34.0)	189 (41.0)	
	Neither living	60 (20.2)	110 (23.9)	.014
Own mobile phone	Yes	115(52.5)	351(76.1)	
	No	140(47.5)	110(23.9)	<.001
Television in the Home	Yes	205(69.7)	336(73.2)	
	No	89(30.3)	123(26.8)	.171
Electricity in the Home	Yes	231(78.0)	379(82.6)	
	No	65(22.0)	80(17.4)	.074
Radio in the Home	Yes	214(72.5)	340(73.9)	
	No	81(27.5)	120(26.1)	.369
SES Index Scale	Low	106 (35.7)	181(39.3)	
	Moderate	106(35.7)	158 (34.3)	
	High	85(28.6)	122(26.5)	.600

Table 2. Bivariate correlations of socio-cognitive variables by sexual activity status among adolescent 16-18 years old in the slums of Kampala (n=757)

		Abstainer	Non- Abstainer	p-value
Attitudes				
Others ways to express love	Yes	189 (75.6)	342 (81.4)	.045*
Condoms take away pleasure	Yes	72 (39.1)	227 (61.7)	<.001*
Girls can suggest condoms	Yes	253 (92.3)	372 (87.7)	.033*
HIV is a serious health issue	Yes	275 (97.2)	400 (95.7)	.210
Condoms prevent pregnancy	Yes	245 (92.1)	387 (92.1)	.547
Perceived Norms				
Don't plan to have sex	Yes	180 (76.3)	167 (46.0)	<.001*
Think I should not have sex	Yes	189 (74.4)	116 (46.5)	<.001*
Adults discourage sex	Yes	263 (93.3)	340 (83.5)	<.001*
Would be upset about me sex	Yes	272 (98.2)	327 (86.1)	<.001*
Think I should carry a condom	Yes	143 (62.4)	197 (56.3)	0.83
Intentions				
Have sex within next 6 months	Yes	52 (19.3)	297 (75.5)	<.001*
Use a condom during sex	Yes	245 (90.4)	339 (86.5)	.078
Able to avoid situation that encourage sex	Yes	262 (95.6)	353 (89.6)	.003*
Able to refuse to have sex if I did feel like it	Yes	270 (98.2)	387 (93.0)	.001*
Able to use a condom	Yes	172 (66.7)	381 (91.4)	<.001*
Alcohol Use				
Current drinkers	Yes	53 (17.9)	249 (54.0)	
	No	243 (82.1)	212 (46.0)	<.001
Drunkenness	Yes	37 (68.5)	209 (84.3)	
	No	17 (31.5)	39 (15.7)	.008

Binge Drinking	Yes	34 (64.2)	182 (73.4)	
	No	19 (35.8)	66 (26.6)	.118

Table 3. Binominal logistic regression analyses for demographic factors, attitudes, norms and self-efficacy as predictors for sexual activity (non-abstinence) among youth 16-18 years old in the slums of Kampala (N= 757)

Characteristic		OR	p-value	95% CI
Gender	Girl	1.00		
	Boy	.567	.026	.344-.935
Age	18 years	1.00		
	17 years	.659	.248	.325-1.33
	16 years	.644	.197	.330-1.25
Have girlfriend/boyfriend	No	1.00		
	Yes	11.32	.000*	6.49-19.75
Ever Homeless	No	1.00		
	Yes	3.39	.000*	1.82-6.31
Parents Living	Both dead	1.00		
	One alive	.438	.019	.220-.873
	Both alive	.531	.030	.300-.941
Own a phone	No	1.00		
	Yes	1.72	.054	.991-2.98
Other ways to express love	No	1.00		
	Yes	2.00	.021	.300-.941
Condoms take away pleasure	No	1.00		
	Yes	2.00	.006	1.21-3.29
Girls can suggest condoms	No	1.00		
	Yes	1.00	.990	.434-2.32
HIV is a serious health issue	No	1.00		
	Yes	.184	.015	.047-.722
Friends plan to have sex	No	1.00		
	Yes	2.31	.014	1.18-4.55
Friends think I should have sex	No	1.00		
	Yes	1.11	.740	.577-2.17
Adults discourage sex	No	1.00		
	Yes	.705	.443	.288-1.72
Parents would be upset about me having sex	No	1.00		
	Yes	.166	.009	.043- .063
Have sex within next 6 months	No	1.00		
	Yes	7.55	.000	4.94-11.53

Able to avoid situation that encourage sex	No	1.00		
	Yes	.304	.016	.116-.799
Able to refuse to have sex if I did feel like	No	1.00		
	Yes	.275	.042	.079-.952
Able to use a condom	No	1.00		
	Yes	5.14	.000	2.93-8.99
Drunkenness	No	1.00		
	Yes	3.25	.012	1.29-8.16
Parental violence	No	1.00		
	Yes	.847	.701	.363-1.97
Intimate Partner violence victim	No	1.00		
	Yes	2.65	.068	.930-7.60

It Takes a Village: Examining the Role of Community Cohesion on HIV Status and Related Risk Behaviors among Youth Living in the Slums of Kampala

1.0 Introduction

Alcohol misuse among adolescent is a global health challenge. According to the World Health Organization (WHO), alcohol use contributes to more than 6 percent of the global fatalities, accounting for nearly 3.3 million deaths per year (2016). Among people 15 to 49 years of age, alcohol misuse is the leading cause of premature death and disability. In addition to interfering with normal biological development, alcohol use in adolescence is associated with a host of negative health outcomes including, long-term alcohol dependence, violence perpetration and victimization, as well as increased risk of exposure to HIV and other sexually transmitted infections (STIs)(Fonner et al., 2014; Wenzel et al., 2004; Bauermeister, Zimmerman, & Caldwell, 2010). Studies have shown parental involvement, familial environment, peer influence, trauma exposure, and perceptions of alcohol marketing to be factors closely associated with alcohol consumption behavior among youth (Kalichman et al., 2007; Swahn, 2014). However, emerging research suggests that community-level characteristics are important determinants to understanding risk and health behaviors (Burke-Miller et al., 2016; Chen, Voisin, & Jacobson, 2016; Gorman-Smith et al., 2004).

Over the past 15 years, research has examined how community characteristics and features influence the health and well-being has expanded drastically. Developments in geospatial information systems and technology have allowed for the mapping of health outcomes and risk

to be linked to physical locations and neighborhoods (Latkin, German, Vlahov, & Galea, 2013). Recent studies have shown that HIV prevalence density differ based on community-level factors, and that CD4 levels and anti-retroviral treatment adherence can be significantly associated with these characteristics (Burke-Miller et al., 2016). In a study examining geographic variability in immune and viral HIV outcomes, Burker- Miller and colleagues (2016) found notable variations in CD4 levels among women based on their community characteristics. The results also showed that individuals living in racially segregated, poorly built communities were significantly more likely than those that did not reside in such neighborhoods to have HIV, report low CD4 levels and also abuse drugs and alcohol(Burke-Miller et al., 2016). Community determinates for risk behaviors and health outcomes extend beyond the physical environment. The social dynamics of a neighborhood like disorder, disorganization, cohesion and safety have been shown to influence risk behaviors (Latkin & Curry, 2008; Wenzel et al., 2004; Winstanley et al., 2008). The way in which individuals interact with one another and the perceptions of those relationships are a critical component to the mechanisms that affect how community-level factors influence individual health behaviors (Bauermeister, et al, 2010).

1.1 Theoretical framework

The study of the relationship between community characteristics and individual health is largely attributable to the social disorganization theory (Shacham, Lopez, Onen, 2016). Although there are other conceptual frameworks for understanding the interaction between risk environments and health, many of the early theories in this area focused primarily on the physical environment as an antecedent for risk behaviors. In contrast, the social disorganization theory(Rolfe, 2006;) emerged to narrow previous theories' focus toward the geospatial and social factors associated

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with criminal behavior (Browning, 2002). Developed in the field of criminology, the social

disorganization theory is an ecological framework that was developed to explain crime

disparities between neighborhoods based on both physical and social levels of disorder

(Browning, 2002; Gracia & Herrero, 2007, Shacham, et al, 2016). According to this theoretical

framework, neighborhoods with physical signs of decay and blight that are typically associated

with socioeconomic disadvantage, coupled with structural oppression and/or the existence of

anti-social subculture such as gangs and other forms of delinquency, erodes the socially

protective interdependence ideally created by community(Latkin & Curry, 2008; Latkin, Curry,

Hua, & Davey, 2007; Winstanley et al., 2008). The deterioration of the communal social fabric

by concentrated poverty, social marginalization, and highly transient populations weakens the

neighborhood's ability to self-regulate and exert control over its members resulting in high crime

and increased disorder(Browning, 2002). The social disorganization theory provided a

conceptual framework through which to explain aggregate crime. However, the model did little

to explain the mechanisms that connect neighborhood characteristics with behavior (Sampson,

Raubenbush, & Earls, 1997). Other theoretical constructs have since emerged to bolster and

expand the social disorganization theory to include concepts that illuminate the process through

which this interaction occurs (Chen, Voisin, & Jacobson, 2016; Latkin, et al., 2007).

In neighborhoods plagued by social disadvantage and disorder are signaled by pervasive

violence, destabilized family structures, public drunkenness and substance use, homelessness and

loitering (Winstanley et al., 2008). Prolonged exposure to these factors have been shown to

trigger depression, suicide ideation, feelings of entrapment, anxiety, fear and overall

psychological distress (Latkin & Curry, 2008; Surratt, Kurtz, Levi-Minzi, & Chen, 2015). In a

study examining suicidal ideation and attempts among older Canadian adolescents, researchers

found that the odds of reporting suicidal thoughts were twice as high among poor youth compared to the non-poor (Burke-Miller et al., 2016;Dupere', Leventhal and Lacourse, 2009). Furthermore, youth from disadvantaged communities were approximately four times more likely to attempt suicide compared to their non-poor counterparts. When researchers controlled for sociodemographic factors, neighborhood poverty remained significantly associated with suicide attempts among adolescents (Dupere', et al, 2009). Living in neighborhoods wrought with violent crime has been found to be a vital pathway to psychological distress through perceived neighborhood disorder and personal experiences with violence (Latkin et al., 2013; Curry, Latkin, Davey- Rothwell, 2008; Frye, 2007). Psychological responses to living in an environment with these stressors can result in depression, and suicide ideation. Both health outcomes have been strongly linked with alcohol and drugs across the lifespan (Gracia & Herrero, 2007; Chen, Voisin,& Jacobson, 2016). Evidence suggests that residing in physically and socially disordered communities may be linked with increased substance use as a coping mechanism for the daily stresses associated with the environment (Wenzel, Tucker, Elliot, Hambarsoomians, Perlman, Becker, Kollross, & Golinelli, 2004, Cunradi, 2007). The relationship between living in impoverished disordered communities and risky behaviors has been found to be mitigated by the social dynamics of the neighborhood (Cunradi, 2007;Latkin et al., 2013). The buffering effects of positive community social dynamics in curtailing risk behaviors is often referred to as the "neighborhood effect" (Sampson et al., 1997;Forrest & Kearns, 2001). For example, among low-income Latino families self-segregation, strong cultural identity, lack of cultural assimilation, and tight familial network were found to protect against the violence exposure and substance use often associated with living in disadvantaged neighborhoods (Gracia & Herrero, 2007; Cunrandi, 2009).

The role of community social dynamics on health behaviors is inextricably linked to health decisions and ultimately, behaviors (Forrest & Kearns, 2001). The concept of collective efficacy, an expansion of the social disorganization theory, describes the means through which neighbors, either explicitly or implicitly, unify to maintain social control through the enforcement of an agreed upon standard (Sampson et al., 1997; Schiefer & van der Noll, 2017). This social construct is based on a perceived mutual trust, expectation, and willingness to help each other, held by members of the community. Informal social control and social cohesion are the two constructs that comprise collective efficacy. Informal social control describe a neighborhood's ability to maintain social order (Schiefer & van der Noll, 2017;Forrest & Kearns, 2001). While social cohesion denotes the degree to which neighbors feel interconnected through a shared knowing, helping and trusting of each other (Latkin, German, Vlahov, Galea, 2013). Social cohesion is the lynchpin for collective efficacy, as a neighborhood that is fearful and lacking a mutual trust and engagement will likely be unable to muster the collective goodwill needed to intervene or otherwise enact informal social control (Schiefer & van der Noll, 2017). Research suggest that communities may have positive overall impact on overall well- being (Pronyk et al., 2008). Cohesion within neighborhoods and communities has been shown to enhance both social and physical health of vulnerable groups (Cramm, Nieber, 2015). Community cohesion was found to be strongly correlated with pediatric nutrition, and childhood obesity (Sampson et al., 1997). Similarly, levels of community cohesion were found to be associated with a decreased risk of engaging in substance use and HIV-related risk behaviors (McGill et al., 2014;Crosby, et al, 2003). For example, among commercial sex workers in Swaziland, social cohesion was positively associated with consistent condom use and fewer negative interactions with law enforcement (Fonner, Kerrigan, Mnisi, Ketende, Kennedy & Baral, 2014). Similar findings were

found among inner-city Baltimore youth. In the Baltimore study, perceptions of community

cohesion were predictive of condom use (Kerrigan, Witt, Glass, Chung &, Ellen, 2006). Those

that perceived their neighborhood as high in cohesion, reported condom usage nearly 15 percent

higher than those perceiving lower levels of community cohesion, thereby decreasing overall

vulnerability to HIV among a high-risk population. Studies have shown social cohesion to be a

protective factor for substance use across drug types (Ahern, Galea, Hubbard & Syme, 2009;

Crosby, Holtgrave, Diclemente, Wingood, & Gayle, 2003). Patterns of alcohol use, including

binge drinking have been found to be inversely related to perceived cohesion (Cleveland,

Feinberg, Bontempo, Greenberg, 2008). A systematic review of 134 studies examining the

community level factors associated with alcohol use, found largely inconsistent findings across

aspects of social disadvantage such as poverty, unemployment, crime, social disorder, and

deprivation (Bryden, Roberts, Petticrew, & McKee, 2013). However, high community cohesion,

as defined by community closeness, attachment, supportiveness and involvement, was

consistently predictive of lower alcohol use among adolescents and school-age youth (Kerrigan,

et al., 2006; Bryden, et al, 2013;Smylie, Medaglia, & Maticka- Tyndale, 2006)).

1.2 Gaps in the literature

Much of the literature examining the interaction between community dynamics and health

has largely been focused on its impact on nutrition, physical activity and criminality. Although

growing, there remains limited knowledge of the relationship between community cohesion and

its impact on alcohol use and HIV-related risk behaviors. The interaction between community

cohesion and high-risk behaviors have been vastly under researched in sub-Saharan youth

(Pronyk, Harpham, Morison, Hargreaves, Kim. Phetla, Watts & Porter, 2008). Studies examining

the role of community cohesion on HIV-related risk have largely been based in the U.S and other western countries and primarily targeted urban adults. Little is known about how community dynamics effect behavior among youth living in sub-Saharan Africa.

Slum communities are often overlooked as it relates to research community contexts. According to the World Bank estimates, in 2014 more than half of the world's population resided in slums, accounting for more than 1 billion people. These communities are generally densely populated, informal settlements, primarily located within urban cities often characterized by a lack of access to clean water, appropriate sanitation infrastructure, sufficient living area, unreliable electricity, and dubious durability of housing. Many of these communities experience chronically high levels of crime, robbery, rape and, prostitution. As result they are often deemed highly unsafe and residents are at increased risk of being the victims of violent crimes. The deplorable conditions of slum-living interact to produce prime environments for HIV rates to flourish, alcohol use and drug abuse to thrive and violence to spread (WHO, 2014).

Among Ugandans living in slum communities, the disadvantages associated in abject poverty are daily realities. Youth in these slums are especially vulnerable to violence, alcohol and HIV transmission (Swahn, Dill, Palmier & Kasirye, 2015). According to the Uganda International Organization for Migration (2017), nearly half of all people living in Kampala slums have experienced some act of violence. Mob justice, domestic violence, and rape were the most commonly reported violent experiences.

1.3 Study aims

The primary aim of this study was to assess the relationship between perceived community cohesion and HIV- related sexual risk behaviors and alcohol consumption patterns among

adolescents living in Kampala slums. The two guiding research questions were: (1) What

correlation, if any, exists between perceptions of community cohesion and HIV status and

related-sexual risk behaviors and (2) Are perceptions of community cohesion associated with

drinking patterns? The study hypotheses asserts that levels of community cohesion were

significantly associated with HIV status as well as levels of sexual risk and drinking behaviors.

Building on findings from previous studies, it is further theorized that lower levels of perceived

community cohesion were significantly associated with increased engagement in high risk

behaviors.

2.0 Methods

Data were derived from the 2014 Kampala Youth Survey, a cross-sectional study of

disadvantaged youth, 12 to 18 years old, living in slum communities across Kampala, Uganda.

The primary aim of the survey was to assess alcohol use, violence, sexual risk behaviors and

HIV prevalence. Through convenience sampling youth were recruited from areas surrounding

one of the Uganda Youth Development Link (UYDEL) drop in centers. Located in 6 urban slum

communities across Kampala, UYDEL provides vocational training, sexual health services, and

mental health counseling to homeless youth, and those living in slums. At the time of this study,

organization- wide UYDEL provided services to approximately 650 youth per month and even

more youth through outreach programs. . Study recruitment occurred while youth were engaging

in activities in the neighborhoods surrounding the drop-in centers.

2.1 Data collection

Data were collected between April and May of 2014. During this period 1,628 youth were solicited for participation, primarily through word- of-mouth. Of those recruited 92 percent consented to participate while 131 declined, yielding a total of 1,497 surveys collected. Three hundred and twenty surveys were lost due to technical issues with the software server resulting in a final sample of 1,134 surveys, which included 43 pilot cases. Surveys were administered to the participants using Google Nexus 7 tablets with the Qualtrics survey software (Qualtrics, Provo, UT, USA).

Survey questions were translated from English into Luganda (the most common local language in the region) by a certified translator and back-translated for accuracy. During administration participants were asked their language preference and the survey was administered accordingly. Trained UYDEL health workers administered surveys through in-person interviews lasting 20 to 30 minutes, following proper consent protocols. Parental consent was waived for youth ages 12 to 17 within this context due to the following Ugandan regulations regarding consent: (1) Minors who provide and tend to their own livelihood are considered emancipated at age 14; (2) HIV testing can be performed without parental consent as early as 12 years old; and (3) With the high prevalence of orphaned or "abandoned" youth, UYDEL was considered a custodial proxy acting in the interest of the children. Participants received a small snack and a drink (juice or soda) as incentive for participating in the survey. All included participants provided informed consent for their inclusion in the study. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Institutional Review Board at Georgia State University (H14101) and the Uganda National Council on Science and Technology (SS3338).

Interviewers received a one-day training on consent procedures, survey administration

protocols and the use of the tablet. As a part of the training, staff were instructed to read the

survey questions exactly as they appeared on the tablet screen after obtaining consent from the

participants. Tablets were programmed to notify the interviewers of any missed questions and

also processed skip patterns automatically for more accurate data collection. The use of mHealth

technology in this project made the survey administration more timely and effective and afforded

the researchers a larger sample than in the 2011 Kampala Youth Survey. Interviewers were also

assigned a tablet with a unique identifier to be used over the course of the survey administration

to ensure data quality and protocol fidelity.

2.2 Study instrument

The survey was based on measures previously validated in the United States and globally

including: the Youth Behavioral Risk Surveillance Survey (YBRSS), Global Health Youth

Survey(GHS), Kampala Youth Survey 2011, US AID Survey, MAMPA 2012 Questionnaire,

AUDIT Self-Report Version, CAGE Questionnaire, iMPPACS, AIDS Indicator Survey and the

National Teen Pregnancy Survey. The survey included both multiple choice and open ended

questions. The items queried participants on a variety of demographic and health –related issues

including sociodemographic characteristics, family involvement, sexual activity, alcohol use, and

violence exposure and community perceptions.

2.3. Measures

Demographic characteristics. Participants self-reported their age, sex, and education

level as well as indicators for socioeconomic status. Along with the educational variables, type of

housing structure, housing materials, experience with homelessness, orphan hood and access to

electricity, mobile phone, television and radio were used to create a socioeconomic status composite score. Composite scores ranged from 1 to 10, with 10 being associated with higher levels of socioeconomic status and. Wealth quartiles were used to rank socioeconomic status scores.

HIV- Related Sexual behaviors. HIV-related risk behaviors were the dependent variables of interest for this study. They included: (1) condom use during last sexual intercourse (2) sexual activity status, (3) multiple partners in the past six months, (4) engage in transactional sex, (5) ever diagnosed with a STI and (6) HIV status.

Sexual activity. Sexual activity was defined as having engaged in vaginal sexual intercourse within the past 12 months. Respondents that reported 'ever had sexual intercourse' and having had sex in the past year were defined 'sexually active'. The sexual activity was then coded dichotomously as sexually active 'yes' or 'no'.

Consistent condom use. Inconsistent condom use is a primary predictor of HIV status among youth (CDC, 2017). The consistent practice of correct condom use is regularly cited as one of the primary strategies for preventing the transmission of HIV. Study participants were queried about their use of condoms. Consistent condom used was assessed through using 2 measures. Participants were asked whether a condom was use the last time they had sexual intercourse. Responses were dichotomized as 'yes' or 'no'. To measure consistency with condom usage, respondents were asked in how often in the past 3 months prior to the survey did they use a condom during sexual intercourse. Responses were 'always', 'most of the time',

'sometimes', or 'never'. Because 'consistent condom use' requires unyielding fidelity to reduce

HIV- risk, all responses other than 'always' were coded as 'inconsistent users'. Those that

responded 'always' were categorized as consistent condom users.

Number lifetime sexual partners. Respondents were asked about the number of different

sexual partners they experienced within their lifetime. Responses were categorized as 'none', '1 -

2', '3-4', '5-6' or '6 or more'. Concurrent multiple sexual partners and the number of sexual

partners over the course of a lifetime is a risk factor for HIV. Item responses were re-coded into

a dichotomous variable. Participants that reported having 1 to 2 partners were included in one

group and those reporting 3 or more partners were grouped into another. The final category

included 1 to 2 or 3 or more with those reporting no lifetime sexual partners excluded from the

analyses.

Transactional sex. Transactional sex is a significant risk factor for HIV. While, there is

no consensus on the definition of the term, Wamoyi and colleagues (2011) defines transactional

sex as "*non-marital, noncommercial sexual relationships motivated by the implicit assumption*

that sex will be exchanged for material benefit or status (p.1)". To assess the prevalence of

transactional sex among respondents, participants were asked if they had ever gotten money,

food, or other things for having sex with someone. Responses were dichotomized as 'yes' or

'no'.

HIV status and STI diagnosis. HIV status and previous diagnosis with sexual transmitted

infection were self-reported. HIV status was assessed with a single item: 'Have you been told by

a doctor or nurse that you have HIV?' To assess STI history participants were asked if they had

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ever been told by a health professional or counselor that they had a sexually transmitted infection. Responses for both items were coded and recorded as a binary 'yes' or 'no'.

      Drinking behaviors. Alcohol drinking patterns were measured using 4 measures: (1) current drinking status, (2) binge drinking, (3) drinking before sex and (4) drunkenness. To measure current drinking status respondents were asked 'have you had alcohol in the past year'. Participants that responded, 'yes' were defined as 'current drinkers' and those that responded "No" were defined as "non-drinkers". Study respondents were asked how many times, if any, in the past month they had five or more drinks during one occasion. Participants that reported having five or more drinks in a row during on one occasion at least once during the month were defined as 'binge drinkers'. Those reporting not drinking five consecutive drinks in one sitting on any days were defined as 'non- binge' drinkers. It should be noted that the CDC denotes gender difference in the measure of binge drinking. Among women binge drinking is defined as consuming four more drinks within a single sitting. For men, five drinks is the baseline for identifying binge drinking behavior. In the Kampala survey respondents were asked in the past month 'how many times, if any' have you had five or more drinks. Because of this limitation it is understood that binge drinkers, as operationally defined by the CDC, may be underrepresented. To measure experience with drunkenness, participants were asked within the past month on how many days did they drink so much they were really drunk. Respondents that reported being drunk 1 or more days were identified has having experience with drunkenness. A dichotomous variable was created as "experience with drunkenness" with binary 'yes' or 'no' responses. Participants were also asked if they drank alcohol before they engaged in sexual intercourse. Responses were a dichotomous, 'yes' or 'no'.

Community perceptions. The current study measured the relationship between respondent's perception of the cohesiveness of their communities and HIV- related risk behaviors and alcohol consumption. Sampson and colleagues developed a composite measure to assess collective efficacy within a community (2013). The measure included two subscales, one of which served as the conceptual construct of interest for this study, community cohesion. The other subscale, informal social control did not fall within the scope of this study. Referencing Sampson's five measures of perceived neighborhood cohesion, four were adapted for use in this study. The original Likert scaled response was modified to a dichotomous, 'yes' or 'no' for the Kampala survey. Participants were asked four questions related to the cohesiveness of their community: (1) People in my neighborhood help each other out; (2) We watch out for each other in this neighborhood; (3) There are people I can count on in this neighborhood and; (4) I feel safe in this neighborhood. From the responses, a community cohesion composite score was created ranging from 1 to 4. Cronbach's alpha of the variables were 0.88 indicating good reliability. An affirmative response to the community level items was associated with one composite point while a 'no' response received a '0'. The score for each response was then summed to create the overall community cohesion score. Responses to all of the cohesion questions were required to calculate a composite score. Respondents with non- responses to any of the composite items were excluded from analyses. Composite scores were then converted into a binary, categorical variable with scores of 1 to 2 coded as 'low cohesion' groups and 3 to 4 'high cohesion'.

Data Analyses. Descriptive statistics were calculated for all study variables including frequencies and distributions. Bivariate associations between community cohesion, HIV status, and drinking

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behaviors were calculated. Multi-nominal logistic regression models were used to assess unadjusted associations between community cohesion categories and the primary outcomes of interest.

3.0 Results

3.1 Univariate analysis

The sample of 1,133 was comprised of males (43.9%) and females (56.1%) aged 12 to 18 years (Table 1). The mean age of participants in the included analysis was 16.14 with nearly 70 percent of the sample over the age 16. More than half of the respondents reported having at least some primary education. Approximately 5 percent of participants had no formal education. Twenty-two percent of the youth reported experiencing homelessness during their lifetime. Males experienced 10 percent higher frequency of homelessness, compared to their female counterparts. Forty percent of participants had both living parents. Females experienced significantly higher prevalence of orphan hood compared to males (24.1 percent and 19.7 percent, p=.014 respectively). The majority of the study sample ranked within the low to medium socio-economic group, with approximately 40 percent falling in the low SES classification. More than 10 percent of the sample reported receiving a HIV diagnosis from a healthcare provider and nearly 40 percent of the sample (37%) reported having previously been diagnosed with a STI. There were significant gender differences in STI history between males and females with nearly half females (42.1%) reporting a diagnosis compared to 31 percent of males. Approximately 30 percent of the sample were current drinkers. More than 70 percent of respondents reported high levels of community cohesion.

The sociodemographic characteristics of the participants by community cohesion are shown in Table 1. There were no significant age, gender, education or SES differences between low cohesion and high cohesion groups. However, participants with low neighborhood cohesion scores experienced more homelessness than those in the overall sample and significantly more than those in the high cohesion group (27.7% and 19.7% respectively). Low cohesion participants also experienced higher prevalence of orphan hood (27.7%). HIV and STI rates did not differ significantly between low and high cohesion groups. However, drinking was nearly twice as high among participants in the low cohesion group compared to high community cohesion group. Participants reporting high levels of community cohesion reported lower percentages (26.3%) of drinking than the overall sample (30.5%).

3.2 Bivariate analyses

Bivariate analyses revealed drinking status and patterns differed significantly across cohesion groups (Table 2). Participants reporting high levels of community cohesion were significantly less likely to report being a current drinker (OR=.504, 95%CI .384-.661) than those reporting low levels of cohesion. Respondents that reported drinking before sex and being drunk in the past 3 month had greater odds of having low levels of community cohesion. High cohesion was associated with significantly lower odds of drinking before sex (OR=.489, 95% CI .334-.716) and drunkenness (OR=.554, 95% CI .310-.991). However, there were no significant differences in binge drinking between groups. Respondents with high levels of community cohesion were 42 percent less likely (OR: .581, 95% CI .435-.775) than those with low cohesion scores to report participating in transactional sex.

Social cohesion was significantly associated with several HIV-related risk behaviors. Forty- six percent of the sample was sexually active. Participants with high levels of community cohesion were significantly less likely to report being sexually active compared with those with low community cohesion. Among sexually active respondents, those in the high cohesion groups reported significantly fewer sexual partners in the past three months compared to those with low cohesion scores. However, STIs and HIV diagnosis were not significantly correlated with level of community cohesion. High community cohesion was associated with several protective sexual behaviors related to condom use including being nearly twice as likely to report consistent condom use with their partner (OR: 1.90 p=.002 95% CI 1.23- 2.92) and wearing a condom the last time they had sex (OR: 1.58 p=.007 95% CI 1.109- 2.253).

3.3 Multinomial logistic regression

The multinomial logistic regression analysis assessed the association between levels of community cohesion and the various sociodemographic characteristics that were significant in the bivariate analysis (Table 2). Community cohesion groups were significantly correlated with drinking and sexual practices among the participants. Being a current drinker (AOR: .845 p=<.001 95% CI .774- .923), drinking before sex (AOR: .832 p=.003 95%CI .738-.938) and experiencing drunkenness within the past 30 days (AOR: .823 p=.045 95% CI .680-.995) was inversely associated with high community cohesion. However, contrary to the findings of the bivariate analyses when controlled for confounding variables community cohesion did not significantly correlate with sexual activity (AOR: .922 p=.058 95%CI .848- 1.003). Nonetheless, it remained associated with having multiple sex partners (more than 2) and participation in transactional sex. The high community cohesion remained associated with the behaviors, AOR:

.859 p=.008 95%CI .767-.962 and AOR: .864 p=.003 95%CI .784- .951 respectively.

Additionally, high cohesion was significantly associated with consistent condom use.

4.0 Discussion

This study examined the relationship between perceptions of community cohesion and HIV status, high risk drinking and sexual behaviors among youth living in slum communities. Based on the established literature, the study hypotheses asserted that levels of neighborhood cohesion would be significantly correlated with HIV status as well as drinking behaviors and sexual practices. It was stated that higher levels of community cohesion would be associated with protective behaviors; while low cohesion would be associated with high- risk behaviors such as drinking alcohol, binge drinking, drunkenness, and drinking before sex. Additionally, inconsistent condom use, multiple sex partners and other high risk sexual behaviors were posited to be associated with low community cohesion.

The results showed, regarding HIV- related behaviors, community cohesion was significantly associated with between- group differences. High community cohesion was associated with decreased risk of being sexually active, and engaging in transactional sex. It was also a protective factor for having fewer sexual partners and consistently using condoms. However, after controlling for covariates, cohesion did not predict sexual activity. Yet, remained associated with transactional sex, multiple sex partners and consistent condom use. Lastly, the findings revealed no significant relationship between community cohesion levels and STIs or HIV. However, drinking patterns were found to differ significantly across levels of community cohesion. Adolescents that reported higher levels of cohesion within their community were less likely to drink alcohol, participate in binge drinking, experience drunkenness, and consume

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alcohol before sex. After controlling for confounding variables, community cohesion levels remained associated with all drinking behaviors except binge drinking.

These findings reaffirm results from other studies that have found community cohesion to have a protective relationship on alcohol and sexual risk behaviors among youth (Burke-Miller et al., 2016; Fonner et al., 2014; Latkin et al., 2007, 2013; Pronyk et al., 2008; Schiefer & van der Noll, 2017; Smylie et al., 2006; Wenzel et al., 2004). High community cohesion was correlated with condom use reflecting the results found among other vulnerable populations such as inner city youth and sex workers. Although, not the case in this study, there is evidence to suggest that the strength of the relationship between cohesion and risk behaviors are moderated by age. When assessing the impact of community cohesion on risk behaviors, researchers found that community cohesion was protective against HIV-risk. However, the effects were strongest among younger participants compared to older. The results of this study revealed high community cohesion was significantly protective of a broad range of HIV-related risk behaviors. However, contrary to the findings of several other studies, the results did not reveal any significant association with HIV status and STIs. This may suggest that while youth with high levels of cohesion are less inclined to engage in high –risk sexual and drinking practices there exists other factors that are hindering the protective aspect of this social dynamic to reduce risk of HIV transmission.

These findings highlight the complex relationship between community social dynamics and individual health behaviors. There is a robust body of research suggesting the positive role of community cohesion on HIV- prevention. However, the result of social cohesion as a protective factor for HIV-related risk varies across studies. In some instances, high community cohesion has been associated with increased risk of engaging in high risk behaviors. For example, in a

study to examine the role of social capital, a dimension of social cohesion, on HIV- risk among rural adolescents and young adults in South Africa, researchers found that among males living in a home with high levels of cohesion were largely protective against HIV risk. However, among females, high levels of social capital were associated with higher prevalence of HIV than those with lower levels of cohesion (Pronyk et al., 2008). The researchers attributed this negative relationship to the broadened social networks associated with higher levels of social capital and thus increased exposure to risk.

4.1 Limitations

A strength of this study was the conceptualization of community- level social correlates largely unexplored among sub- Saharan youth in slums. However, there were several limitations to this study that should be factored in when interpreting the findings. The cross-sectional design of the study limits any casual inferences that might be drawn. Another limitation was that only one dimension of social efficacy was assessed which only allowed for limited assessment of how community cohesion interacts with other community-level social dynamics to influence HIV-related risk and risk behaviors. Finally, because the community cohesion construct was based on a composite measure where the categorical designation of 'high' and 'low' may be too crude and should be interpreted without overstating that distinction between the groups.

4.2 Conclusions and recommendations

      The influence of community-level social factors on alcohol use and HIV-related risk in sub-Saharan Africa adolescents are woefully under explored, particularly in slum neighborhoods. Future research should include additional measures to assess multiple dimensions of community social capital on risk-taking behaviors among youth. It should be added that objective measures for community cohesion should also be included. Along with respondent perceptions, this would provide an additional level of analyses for examining the environmental influences in risk behaviors. Findings from this study serve to inform prevention strategies within slum communities and assert that efforts should be made to incorporate community building and empowerment efforts into such initiatives.

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Table 1. Distribution of sociodemographic characteristics by levels of community cohesion among youth living in the slums of Kampala (N=1133)

Characteristic		All Groups (N=1133)	High Cohesion (n=807)	Low Cohesion (n=321)	p-value
		N (%)			
Gender	Boy	497 (43.9)	349 (43.2)	144 (44.9)	
	Girl	636 (56.1)	458 (56.8)	177 (55.1)	.335
Age (years)	12	47 (4.1)	35 (4.3)	12 (3.7)	
	13	72 (6.3)	53 (6.6)	18 (5.6)	
	14	118 (10.4)	93 (11.5)	25 (7.8)	
	15	136 (12.0)	100 (12.4)	36 (11.2)	
	16	161 (14.2)	118 (14.6)	42 (13.1)	
	17	254 (22.4)	178 (22.0)	75 (23.4)	
	18	346 (30.5)	231 (28.6)	113 (35.2)	.262
Ever Homeless	Yes	249 (22.0)	157 (19.7)	89 (27.7)	
	No	884 (78.0)	648 (80.3)	232 (72.3)	.002
Education	Never been	60 (5.4)	36 (4.5)	24 (7.5)	
	Some/complete primary	600 (53.6)	424 (53.3)	174 (54.5)	
	Some/complete secondary	443 (39.6)	326 (41.0)	114 (35.7)	
	Some/complete tertiary	17 (1.5)	10 (1.3)	7 (2.2)	.080
Parents Living	Both parents alive	458 (40.4)	343 (42.5)	114 (35.5)	
	Both parents dead	251 (22.1)	160 (19.8)	89 (27.7)	
	One parent living	425 (37.5)	305 (37.7)	118 (36.8)	.009
HIV-Related Behaviors					
Sexually Active	Yes	520 (46.1)	348 (43.1)	172 (53.6)	.001

Multiple partners	1-2	301 (52.1)	215 (56.3)	86 (43.9)	.003
	More than 2	277 (47.9)	167 (43.7)	110 (56.1)	
Diagnosed with STI	Yes	419 (37.0)	296 (36.6)	123 (38.3)	.322
Diagnosed with HIV	Yes	116 (10.5)	81 (10.3)	35 (11.1)	.381
Engaged in Transactional Sex	Yes	274 (24.3)	172 (21.3)	102 (31.8)	<.001
Used condom within past 3 months	Yes	144 (24.4)	110 (28.1)	34 (17.1)	.002
Used a condom at last sexual encounter	Yes	391 (65.9)	273 (69.5)	118 (59.0)	.007
Alcohol behaviors					
Current Drinker	Yes	345 (30.6)	212 (26.3)	133 (41.4)	<.001
Binge Drinking	Yes	241 (70.1)	148 (70.1)	93 (69.9)	.530
Drink before sex	Yes	150 (25.3)	81 (20.6)	69 (34.7)	<.001
Drunk in the past month	Yes	277 (80.3)	163 (76.9)	114 (85.7)	.030
SES Rank	Low	472 (41.6)	337 (43.0)	133(41.7)	
	Med	280 (24.7)	190 (24.2)	88(27.6)	
	High	356 (31.4)	257 (32.8)	98(30.7)	.497

Table 2: Unadjusted and adjusted multinomial logistic regression analyses for social cohesion as a predictor of alcohol use, and risky sexual behavior among youth in the slums of Kampala (N=1133)

	OR [a]	p-value	95% CI
Behavior	**Unadjusted OR**		
Alcohol behaviors [b]			
Current Drinker	.504	.000	.384-.661
Binge Drinking	1.01	.530	.629-1.622
Drink before sex	.489	.000	.334-.716
Drunk in the past month	.554	.030	.310-.991
HIV- related behaviors			
Sexual Activity [b]	.655	.001	.505-.850
Multiple partners [c]	1.64	.003	1.16-2.33
STI Diagnosis [b]	.931	.322	.713-1.215
HIV Diagnosis [b]	.918	.381	.603- 1.39
Transactional Sex [b]	.581	.000	.435-.775
Consistent condom use (3 months) [b]	1.90	.002	1.23-2.92
Condom at last sex [b]	1.58	.007	1.109-2.253
	Adjusted OR		
Alcohol behaviors [b]			
Current Drinker	.845	.000	.774- .923
Drink before sex	.832	.003	.738-.938
Drunk in the past month	.823	.045	.680-.995
HIV- related behaviors			
Sexual Activity [b]	.922	.058	.848-1.003
Multiple partners [c]	.859	.008	.767-.962
HIV Diagnosis [b]			
Transactional Sex [b]	.864	.003	.784-.951
Consistent condom use (3 months) [b]	1.21	.006	1.05-1.38
Condom at last sex [b]	1.14	.020	1.02-1.27

[a] Predictor is high community cohesion.
[b] Outcome is 'Yes'
[c] Outcome is 'More than 2'

Intimate partner violence among Kampala Youth who Date: Examining drinking patterns and HIV-related sexual behaviors

1.0 Introduction

Intimate partner violence (IPV) is a major global health challenge (WHO, 2013). Annually, IPV accounts for approximately 13 percent of global homicides (WHO, 2013). Women and girls are disproportionately impacted by the epidemic of IPV, accounting for 38 percent of all female homicides compared to the 6 percent of male homicides. According to the World Health Organization, globally, nearly 30 percent of girls and young women, 15 to 19 years old experience physical or sexual violence at the hand of an intimate partner. However, IPV prevalence varies greatly by region and country. In Africa, approximately 37 percent of women reported experiencing some form of IPV within their lifetime, making it one of highest prevalence rates in the world.

Intimate partner violence is broadly defined as any harm, physical, sexual or mental caused by a current or past romantic partner (CDC, 2015). The term has generally been applied to relationships involving individuals 15 or older. However, a growing body of research suggests that violence in romantic relationships occurs at earlier ages and can be a major determinate in adolescent health. The magnitude of IPV among adolescents younger than 15 years old is largely unknown. Emerging evidence indicates that sexual (i.e. coercion, rape, sexual assault) and physical violence may be widespread aspects in young relationships (Raj et al., 2006; Smith, Elwyn, Ireland, Thornberry, 2009; Decker, Latimore, Yasutake, Haviland, Ahmed, Blum, Sonenstein & Astone, (2014); Stokcl, March, Pallitto, & Garcia-Moreno (2014).

IPV risk occurs through a multi-level interaction between societal, community, interpersonal and individual level factors. At the interpersonal level, previous studies have examined the individual risk factors for involvement in violent intimate relationship (Stockl, et al, 2014). Low socio-economic status, childhood trauma, previous violence victimization, exposure to familial violence, substance use, personality disorders as well as psychosocial factors such as low-self- esteem, and depression have been shown to be consistently associated with increased risk of being involved in IPV (WHO, 2016; Russell, et al, 2014; Richards, Tillyer, & Wright, 2017). Many of the factors that contribute to the risk of victimization have been shown to precipitate violence perpetration. For example, exposure to childhood physical or sexual abuse is a significant predictor for both victimization and perpetration later in life (Raj, Santana, La Marche, Amaro, Cranston,& Silverman., 2006). In a US-based, nationally representative study, researchers examined the role of childhood maltreatment typology on IPV victims and those that were both perpetrators and victims in adolescence. The results indicated that the role in IPV was largely influenced by the type of abuse experienced in childhood (Richards, et al., 2017). All forms of childhood trauma were found to be associated with involvement in IPV later in life. Early childhood exposure to violent parental relationships has been shown to increase the risk of being involved in IPV later in life (Richards, et al, 2017).

Alcohol consumption is widely considered a significant contributing factor for IPV (WHO, 2016; & Russell et al, 2014). Acting as both the catalyst and an intensifier, alcohol use has been shown to be a trigger for violence as well as exacerbate violence within relationships. While the causal link between alcohol and intimate partner violence is debatable, a robust body of research asserts it is a critical correlating factor for its occurrence and proliferation. The

cognitive and physical impairments associated with alcohol use, have been shown to drive perpetration and victimization. Alcohol suppresses the self-regulatory mechanisms and reduces social inhibition which under normal conditions serve as deterrents for violence escalation. Furthermore, it impedes the cognitive accessibility of non-violent strategies to resolve conflict. Interpersonal and external stressors such as unemployment, financial difficulty, communication deficiencies and others can also be worsened by alcohol use (Russel, et al, 2014). Among men and women arrested for committing violence against their partners, the inability to manage negative emotions, partner provocation, retaliation, communication difficulties and self-defense were shown to be the most common reasons cited for the assaults (Stuart, Moor, Gordon, Hellmuth, Ramsey, Kahler, 2006; Elmuist, Hamel, Shorey, Labrecque, Ninnemann, Stuart , 2014).

While there are copious amounts of evidence citing an association between alcohol use and violence perpetration, particularly IPV, studies have also found compelling support that it contributes to victimization as well (Swahn, Dill, Palmier & Kasiyre, 2015). For many individuals the experience of violent trauma may serve as the impetus for substance use and abuse as a coping mechanism. The behaviors that arise as a result of drinking may be perceived by the partners as unacceptable or simply, being in a state of inebriation may cause them to be viewed as easy targets for abuse. In a systematic review of the associations between IPV victimization in women and alcohol use, the cross-sectional studies revealed a consistent positive relationship between the two factors. Furthermore, the longitudinal studies revealed a persistent, positive correlative pattern of IPV and subsequent alcohol use, as well as alcohol use and then subsequent violence. Such findings further affirm the bidirectional relationship between alcohol

and violent relationships.   However, in as much as consuming alcohol is a risk factor for IPV, specific consumption pattern are closely associated with the risk and intensity of violence, and HIV transmission. Drinking patterns describe the typology of typical alcohol consumption behavior. Studies have shown that adolescents in relationships with partners with discordant drinking patterns were at increased of being involved in IPV (Russell, et al, 2014; Wiersma-Mosley & Fichser, 2017). In relationships involving one partner that was a heavy drinker and one that was not, researchers found high levels of delinquency. Among discordant couples in which the females were the heavy drinkers, they also reported the highest rates of IPV compared to other groups. Conversely, heavily drinking males that drank more than their partners were more likely to perpetrate violence against their partners (Wiersma-Mosley& Fichser, 2017). Although, significantly less is understood about the etiology and mechanisms of IPV among adolescents, evidence suggest that many of the factors associated with adults remain predictive in younger relationships.

The insecure environment and imbalanced power dynamic often present in violent romantic partnerships can serve as a critical conduit for HIV-related risk. In a US-based longitudinal study, researchers found that involvement in IPV hindered safe sex practices among adults. Women that experienced IPV were more likely to report inconsistent condom use and be involved with riskier sexual partners such as those previously released from prison, those involved in concurrent sexual relationships, intravenous drug users and those with previous STI. These women were also more likely to test positive for non-viral STIs significantly more than those not involved (Seth, Wingood, Robinson, Raiford, DiClemente, 2015). In sub-Saharan Africa where the prevalence of IPV is amongst the highest in the world, risk of HIV as a result of

violence- induced relationships are further amplified. Studies have shown women involved in IPV in this region are at a significantly heightened risk of engaging in high-risk sexual behaviors compared to those not involved in violent relationships. Subsequently, they are also substantially more likely to report being HIV positive as well (Sileo, Kintu, Kiene, 2017). Although limited, evidence suggests that HIV status may increase the susceptibility to intimate partner violence.

1.1 Syndemic framework

The intersectionality between IPV, alcohol use and HIV has been well- documented theoretically, but not empirically. Although, there are many empirical research studies examining two components of the framework, few studies have examined all three and their intersectionality. In particular this is a key gap with respect to youth and those living in sub-Saharan Africa specifically. Involvement in violent relationships provides multiple, bi-directional pathways to alcohol use and HIV (Meade, 2016; Gilbert, Raj, Hien, Stockman, & Terlikbayeva, 2015). Consequently, alcohol use and HIV-risk can be both drivers and intensifiers for intimate partner violence. The inextricable, overlapping interconnectedness of these conditions are known as a syndemic relationship. Coined by Singer (2009), a syndemic is a concentrated and deleterious interaction between two or more diseases or other health conditions in a population, especially as a consequence of social inequity. This explanatory framework examines disease interactions, including their origins in disease clustering, dynamics, stages of disease enhancement, and the social conditions that facilitate these processes (Singer, Bulled, Ostrach &Mendelhall, 2017; Tsai, Mendenhall, Trostle & Kawachi, 2017). The co-occurrence of substance use, violence and HIV are collectively known as the SAVA syndemic. This

framework is based on the perspective that these conditions do not occur within a vacuum, but rather they are inextricably linked through a network of bi-directional pathways (Douglas-Vail, 2016). As such, intimate partner violence and its associated risks can only be sufficiently understood, and subsequently intervened upon, by examining it through the context of its relationship with alcohol use and HIV (Stockl, et al. 2014). This interplay drives the progression and trajectory of the individual conditions. Furthermore, the outcome of these interactions are largely produced by the social conditions from which they arise.

The syndemic framework is an integrated social ecological framework that conceptualizesdiseases through the following constructs: (1) sociocultural context, (1) the population of interest, and (3) the biological synergism that connects the disease with the physical health of an individual. This holistic approach expands the epidemiological perspective to include the multi-leveled factors that contribute to the concentration of the disease within certain populations (Douglas-Vial, 2015; Singer, Erickson, Badiance, Diaz, Ortiz, Abraham, & Nicolaysen, 2006). Studies aimed at elucidating the multi-factorial, often nuanced, relationship between violence, HIV and alcohol represent a much needed, growing body of work. The syndemic perspective provides a unifying framework through which to more clearly examine the intersections of their co- occurrences within communities of persistent, concentrated social disadvantage (Singer,et al, , 2006).

1.2 Gaps in the literature

Intimate partner violence has been a field widely investigated among adults, however it has been grossly under researched among younger population. Evidence suggests youth are experiencing violence in relationships during early adolescence which impacts long-term health (Russell, et al.,2014; Stockl, et al, 2014; Gilbert, et al., 2015). However, there are many gaps in the field, as few studies have examined the interconnected behaviors that increase risk of SAVA among young populations. Studies that have done so to-date, have almost exclusively examined vulnerable populations in US communities, particularly college age students. Although an important population, studies have shown that the younger, socioeconomically disadvantaged youth are disproportionately burdened by the impact of the SAVA syndemic. However, there is limited research examining the intersectionality of these conditions in the context of sub-Saharan youth.

1.3 Study aims

This study aims to advance the knowledge of adolescent intimate partner violence and its syndemic relationship with alcohol use and HIV- related sexual risk among sub-Saharan adolescents by: (1) examining the drinking patterns, and (2) identifying HIV prevalence and related sexual behaviors among youth involved in violent intimate partner relationships. This objective will be approached by evaluating the frequency, type, intensity, and social context of alcohol consumption behaviors associated with IPV as well its relationship with HIV status, STI history, condom use, and other sexual behaviors. The three guiding research questions were: (1) Are there drinking patterns associated with being involved in a violent relationships; (2) Does IPV involvement influence HIV and STI risk and; (3) Do sexual practices differ between youth

involved and not involved in violent romantic partnership? Based on the previous studies, we hypothesize that IPV involvement is significantly associated with alcohol consumption and a risk factor for engagement in high risk drinking and sexual behaviors. Furthermore, we hypothesize that HIV and STI status are significantly correlated with involvement in a violent relationship.

2.0 Methods

Data were derived from the 2014 Kampala Youth Survey, a cross-sectional study of disadvantaged youth, 12 to 18 years old, living in slum communities across Kampala, Uganda. The primary aim of the survey was to assess alcohol use, violence, sexual risk behaviors and HIV prevalence. Participating youth were recruited from clients receiving services at one of the Uganda Youth Development Link (UYDEL) drop in centers. Located in 6 urban slum communities across Kampala, UYDEL provides vocational training, sexual health services, and mental health counseling to homeless youth, and those living in slums. At the time of this study, organization- wide UYDEL provided services to approximately 650 youth per month and even more youth through outreach programs. . Study recruitment occurred while youth were participating in community outreach activities in the neighborhoods surrounding the drop-in centers.

2.1 Data collection

Data were collected between April and May of 2014. During this period 1,628 youth were solicited for participation, primarily through word- of-mouth. Of those recruited 92 percent consented to participate while 131 declined, yielding a total of 1,497 surveys collected. Three hundred and twenty surveys were lost due to technical issues with the software server resulting

in a final sample of 1,134 surveys, which included 43 pilot cases. Surveys were administered to the participants using Google Nexus 7 tablets with the Qualtrics survey software (Qualtrics, Provo, UT, USA). Using this mHealth technology allowed for easier administration of the survey, streamlined data collection and increase data quality.

Survey questions were translated from English into Luganda (the most common local language in the region) by a certified translator and back-translated for accuracy. During administration participants were asked their language preference and the survey was administered accordingly. Trained UYDEL community health workers administered surveys through in- person interviews lasting 20 to 30 minutes following proper consent protocols. Parental consent was waived for youth ages 12 to 17 within this context due to the following Ugandan statutes regarding consent: (1) Minors who provide and tend to their own livelihood are considered emancipated at age 14; (2) HIV testing can be performed without parental consent as early as 12 years old; and (3) With the high prevalence of orphaned or "abandoned" youth, UYDEL was considered a custodial proxy acting in the interest of the children. Participants received a small snack and a drink (juice or soda) as incentive for participating in the survey. All included participants provided informed consent for their inclusion in the study. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the Institutional Review Board at Georgia State University (H14101) and the Uganda National Council on Science and Technology (SS3338).

The survey was based on measures previously validated in the United States and globally, including: the Youth Behavioral Risk Surveillance Survey (YBRSS), Global Health Youth Survey(GHS), Kampala Youth Survey 2011, US AID Survey, MAMPA 2012 Questionnaire,

AUDIT Self-Report Version, CAGE Questionnaire, iMPPACS, AIDS Indicator Survey and the National Teen Pregnancy Survey. The survey included both multiple choice and open ended questions. The items queried participants on a variety of demographic and health –related issues including sociodemographic characteristics, family and sexual activity and alcohol use, violence involvement drinking behaviors, exposure to alcohol marketing, HIV knowledge, sex- related practices and beliefs, exposure to violence and community perceptions.

UYDEL interviewers received a one-day training on the consent procedures, survey administration protocols and the use of the tablet. Staff were instructed to read the survey questions exactly as they appeared on the tablet screen after obtaining consent from the participants as a part of the study protocol. Tablets were programmed to notify the interviewers of any missed questions and also processed skip patterns automatically for more accurate data collection. The use of mHealth technology in this project made the survey administration more timely and effective and afforded the researchers a larger sample than in the 2011 Kampala Youth Survey. Interviewers were also assigned a tablet with a unique identifier to be used during data collection to ensure data quality and study fidelity.

2.1 Inclusion criteria

For analytical purposes study participation was limited to male and female youth, age 12 to 18 years of age that reported having a current boyfriend or girlfriend (n=602). Response to at least 1 of the IPV measures were required for inclusion in the study.

2. 2 Measures

Sociodemographic characteristics. Five-items were used to assess salient sociodemographic characteristics, including gender, age, and experience with homelessness, education level and a living parent.

Childhood trauma. Childhood exposure to violence has been shown to be correlated with IPV risk (Richards, et al, 2017). In order to control for its effects on the dependent variable measures on childhood violence exposure were included. Participants were asked about their: (1) exposure to parental IPV and (2) experience with physical abuse by a parent. Respondents were asked whether they had ever seen or heard their parents beating each other and whether they had been beaten so hard by a parent that they had bruises or marks. Responses were dichotomous, 'yes' or 'no'. A binary composite measure for 'childhood exposure to violence' was based on response to the two measures. Respondents reporting having either witnessed parental violence or being physically punished by a parent were coded as 'yes' exposed to childhood violence. Those that did not report exposure were coded as 'no', 'not exposed'. Cronbach reliability for the two variables were .584 indicating a moderate level of reliability.

2.2.1 Outcome variable

IPV Involvement. The study outcome variable was involvement in intimate partner violence. For the purposes of this study involvement in IPV was defined as reporting being involved, either as the perpetrator or victim, in some form of physical or sexual violence at least once during the past 12 months within their current relationship. To assess intimate partner violence involvement respondents were asked whether their boyfriend of girlfriend physically harmed them. They were also asked if they had hit, or forced sex, with their boyfriend or girlfriend within the past 12 months. Participants that reported "yes", they had either been physically harmed or they had been responsible for physically or sexually harming their partners

were categorized as having been involved in intimate partner violence. Participants could have reported being both the victim and perpetrator of violence. However, the differentiation between perpetration and victim were beyond the scope of this study.

2.2.2 Independent variables

Drinking Behaviors and Patterns. Drinking patterns and sexual behaviors were the dependent variables of interest. Multiple measures were used to assess drinking status and patterns among adolescents. Drinking patterns describe the context, frequency and intensity of alcohol consumption behaviors. Studies have established that among adolescents, drinking patterns (e.g. binge drinking and drunkenness) were more predictive of HIV- risk. Within the current study the following patterns were assessed: (1) age of initiation; (2) alcohol preference, (3) drinking companionship (4) age of debut drunkenness (5) experience with recent drunkenness, (6) frequency of drinking, (7) intensity of drinking, and (8) experience with binge drinking.

Initiation. Participants were queried on the age at which they had their first full drink of alcohol. Their recorded ages were reported.

Current drinking status. To measure current drinking status respondents were asked if they had a drink of alcohol within the past year (yes/no). Participants that reported 'yes' to having a drink within 12 months were coded as 'drinkers', while those that did not were defined as 'non-drinkers'.

Alcohol related behaviors. To assess drinking companionship, participants were asked with whom they usually drink alcohol. Options included friends, family, sexual partners, others or drinking alone. Responses were recorded accordingly. Two items were used to assess their

experience with 'drunkenness'. The first item measured the age of the first experience with drunkenness and the second queried their experience with drunkenness in the 30 days prior to the survey. Frequency of alcohol consumption was defined by participants' responses to how often they consumed alcohol. Participants that reported drinking 4 or fewer times per month were defined as 'occasional drinkers'; Those that reported drinking 2 to 3 times per week 'frequent drinkers'; and 'very frequent' drinkers were those that reported drinking 4 or more time per week. For the purpose of this study, drinking intensity is defined as the number of drinks consumed on an average day which was measured by one question.

To assess binge drinking, respondents were asked to report the number of times, if any, that they had five or more drinks in a row on a single occasion. Those that reported having done so 1 or more times were identified as having experience with binge drinking and are henceforth referred to as 'binge drinkers'. It is important to note that the CDC (2014) defines binge drinking for women as consuming 4 or more alcoholic drinks in a single sitting. However, in this study five drinks was used to capture both male and female drinkers. As a result, this may actually have resulted in the under reporting of binge drinking among girls.

Alcohol-related sexual behaviors. Participants were queried about their alcohol-related sexual behaviors using five measures. Respondent were asked about the following behaviors: (1) drinking before sex, (2) drinking heavily before sex, (3) partner drinking before sex and (4) drinking heavily during last sexual encounter. Dichotomous 'yes' or 'no' responses were recorded. The number of times they reported having sex with multiple partners as a result of alcohol use was also recorded.

Sexual behaviors. In this study, sexual activity was defined as being sexually active within the 12 months prior to the survey. Three items were used to assess condom use practices.

Participants were asked how frequently within the past 3 months they used condoms during sex (always/ most of the time/sometimes/never). This item was used to create a dichotomous, aggregate measure of consistent condom use among respondents. Those that reported using condoms 'most of the time', 'sometimes' or 'never' were defined as 'inconsistent users' while those that reported 'always' were identified as 'consistent users'. Number of lifetime partners is a risk- factor for HIV/ AIDS and other sexually transmitted infections. Two items, the number of different partners within the past 3 months and the number of sexual partners across the lifetime, were used to measure the frequency of sexual intercourse with multiple partners. Participants were also asked if they were currently engaged in commercial sex work or transactional sex (i.e. sex for money, food, shelter, etc.). Respondents reported yes or no to the items.

STI History and HIV Status. Prevalence of STIs diagnosis and HIV status was assessed with two self-reported items, 'Have you ever been told that you have a sexually transmitted infection' and 'Have you been told by a doctor/nurse that you have HIV?' All responses were dichotomous, 'yes' or 'no'.

3.0 Results

3.1 Univariate analyses

As shown in Table 1, among adolescents that reported having a boyfriend or girlfriend (n=602), those reporting involvement in IPV and those that were not, did not differ on many demographic and background characteristics. Social economic index ranking did not differ between groups either. However, youth reporting IPV experienced significantly more homelessness, 33.2% and 21.4%, p=.001 respectively. Exposure to parental violence among IPV- involved youth was nearly twice the level of those in non-violent relationships. Nearly half

of the youth in violent relationships witnessed their parents engaged in physical violence with

each other and approximately 60 percent of them were severely beat or hit by their parents.

Although other sociodemographic characteristics were not significantly associated with IPV

involvement, prevalence of STIs and HIV were related. Youth that reported being involved in

intimate partner violence reported significantly higher prevalence of sexually transmitted

infections compared to those that were not. Additionally, nearly 20 percent of respondents that

reported being involved in IPV also reported being diagnosed with HIV. Prevalence was 10

percent higher among IPV-involved youth compared to those not involved. STI prevalence was

also 12 percent higher among youth involved in IPV. Drinking was found to be significantly

higher among youth involved in IPV, 58.3 percent compared to 38.1 percent, p=.000

respectively.

Table 2 describes the drinking behaviors among youth involved in relationship by involvement

in IPV. Among those involved in IPV, they reported their first experience being drunk at

significantly younger ages. Those with no IPV-involvement were twice as likely to report never

being drunk compared to those that had been exposed. However, alcohol preference did not

significantly differ between groups. Nearly 20 percent of IPV-involved respondents reported

drinking with their sexual partners. Significantly higher than approximately the 8 percent of

those in non-violent relationships that did. Additionally, solitary drinking was highest among

those involved in violent intimate relationships. Nearly 90 percent of current drinkers involved in

IPV, also reported drunkenness more often than those that were not (73.6, p=.001). Respondents

involved in IPV were also significantly more likely to report drinking more frequently than those

that were not. More than 3 times as many IPV-involved participants reported drinking 4 or more

times per week compared to those with no IPV involvement. Youth involved in IPV reported

drinking significantly more in a typical day compared to those with no IPV involvement. Nearly half of all respondents exposed to IPV reported having 3 or more drinks on a typical day, compared to the 34 percent of non-IPV involved youth that drank as much. Binge drinking significantly differed by exposure to IPV. More respondents involved in IPV also reported engaging in binge drinking than their counterparts that were not (75.4 %, 64.6%, p=.035). Twice as many IPV-involved respondents (38.7 %) reported drinking before sex, whereas among those not involved in IPV only 15 percent drank before sex (p=.000). Of the IPV involved respondents that do drink before sex, nearly half reported doing so heavily (49.3%) and 20 percent reported doing so the last time that they had sex. Respondents involved in IPV were significantly more likely to report having a partner that drank alcohol before sex. Respondents involved in IPV more frequently engaged in sex with multiple partners as a result of alcohol, compared to non-involved respondents.

3.2 Bivariate analyses

As shown in Table 3 involvement in intimate partner violence was significantly associated with a number of high risk sexual practices. However, there was no statistically significant difference in consistent condom use among those involved and not involved in IPV. Subsequently, there was also no difference in the prevalence of condom use at last sexual intercourse. Thirty percent more IPV-involved respondents reported having more than 2 sexual partners in the past 3 months compared to those not involved. IPV involved respondents were significantly more likely to report greater numbers of sexual partners than those not involved. More than half of those involved in IPV reported inconsistent condom use. The number of lifetime partners was significantly associated with exposure to IPV. Sixty- six percent of youth exposed to IPV reported having 3 or more sexual partners compared to only 37 percent among

those that had not. Individuals involved in IPV were also significantly more likely to be sexually active (86.1%, 67.3%, p=<.001) and have been diagnosed with a STI and/ or HIV. Commercial sex work and transactional sex were also significantly higher among youth involved intimate partner violence. Prevalence of sex work among those involved in IPV was nearly 3 times that of those in a non-violent relationships. Additionally, the transactional sex among IPV-involved youth was nearly twice the rate of those in non-violent relationships. Nearly half of all those involved in transactional sex were also involved in violent intimate relationships.

Based on factors shown to be significant from the chi- square test, bi-variate odd ratios were calculated. Tables 4, 5 and 6 summarize the finding from the bivariate analyses for sociodemographic characteristics, drinking behaviors and sexual behaviors. Youth involved in non-violent relationships were significantly less likely to be homeless, report having been exposed to childhood trauma, be a current drinkers, and have HIV or a history of STIs. The disparity was substantially greater in relation to IPV-involved youth's risk of being HIV-positive, being a current drinker and having been exposed to childhood violence. Respondents involved in violent relationships were 4 times more likely to have been exposed to parental violence, and almost 3 times as likely to be a drinker, as well as have HIV. Similarly, the bivariate analyses revealed significant differences in sexual practices by IPV-involved youth. Youth involved in violent relationships were 3 times more likely to be sexually active than their counterparts not involved in IPV. The odds of engaging in commercial or transactional sex were significantly higher among youth involved in IPV, 3 times and 2 times, respectively. Furthermore, youth involved in non-violent relationships were 70 percent less likely to report having more than 2 sexual partners within 3 months of the survey, compared to their counterparts.

To assess the effects of the independent variables adjusted odd ratios were calculated using binominal logistic regression models. A model was built to assess the covariates: experience homelessness, HIV status, STI history, drinking status, and exposure to childhood trauma and their association with IPV-involvement. The adjusted binominal regression model revealed that all factors were significantly predictive of IPV except homelessness. Predictability of alcohol drinking behaviors as drivers for IPV among the sample. Controlling for the other factors, being exposed to parental violence was associated with 3.94 greater chance of being involved in a violent relationship.

Furthermore after adjusting for the effects of HIV status, STI history, and exposure to childhood trauma, 'drinking before sex' was the only alcohol consumption behavior significantly associated with IPV-involvement. Youth that consumed alcohol before sex were at 2.47 times greater chance of being involved in a violent relationship. Also, parental violence exposure remained predictive of IPV involvement (OR 2.47, 95 % CI=1.41-4.31, p=.001). All other factors were non-significant.   It should be noted that gender was forced into the model due to being established as a significant predictor for involvement in IPV, however, it did not contribute significantly to the predictability of the model and was subsequently removed.

Adjusting for significant covariates among sexual behaviors, the number of sexual partners in the past 3 months significantly predicted involvement in a violent relationship. Additionally, after adjusting for confounders the analyses showed that youth with HIV were 2.23 times more likely to be involved in a violent relationship compared to those that did not have HIV. Parental violence remained a predictor in the model (3.23 OR 3.23, CI 2.133-4.90, p=<.001). However, all other variables in the model were not significant.

4.0 Discussion

The primary aims of the study were to identify the risk of HIV and STI, as well as describe the alcohol consumption patterns and sexual behaviors associated with being involved in violent intimate partnerships. The hypotheses stated that involvement in IPV would be significantly associated with: (1) HIV status and STI history, (2) risky alcohol consumption patterns, and (3) engagement in HIV-related sexual practices.

Our findings show that there were no statistically significant differences in IPV based on age, gender, orphan hood, SES ranking, or education. However, youth involved in violent relationships experienced homelessness, witnessed parental violence and experienced physical violence more often than those that were not involved in IPV. It is not surprising that these factors were associated with IPV, as familial instability and childhood exposure to violence have been found to be stable correlates for IPV (Richards, et al, 2017). However, previous studies have shown socioeconomic status and other demographic characteristics such as gender and education to be significantly associated with involvement in a violent relationship, although it is not consistent across countries (Wilson, 2009). Lower SES has been largely shown to be a risk factor for IPV among both adults and adolescent. However, in the current study measures of wealth did not correlate with intimate partner violence. Most of the studies that establish SES indicators as risk factors for IPV have utilized participants from high-income countries where the SES disparities may translate into a broad gap in access to services and resources that are associated with IPV (Wilson, 2015; Smith, 1999; Cutler et al., 2006; Bangdiwala, Ramiro, Sadowski, Bordin, Huner, & Shankar, 2004). For example, unemployment is a SES indicator that is a risk factor for IPV. Within a relationship, unemployment, or the deficiency in income that it creates, can place additional stressors on a household and exacerbate other issues including substance abuse. Therefore, in a sample in which diverse SES is present when comparing across

the spectrum, income based indicators may represent a more predictable relationship with IPV risk.

Among the limited studies that have examined IPV in sub-Saharan Africa among adolescents they have generally done so with school age populations. Students in schools within this context may represent a broader cross section of SES unlike this study's target population. This study was based in slum communities where SES and other income-related assets many not vary as broadly, thus not creating enough variability to assess discernible differences. Considering that nearly 1 billion of the world's population currently reside in slum areas, and the numbers are expected to continue to grow in the future (UN-Habitat, 2015). The findings provide support for the clear need to bolster the knowledge examining the contextual influences on the SAVA syndemic among populations in slum areas.

Youth involved in violent relationship reported higher prevalence of drinking, STIs, and positive- HIV status. IPV- involved youth were more likely to report: 1) initiating drinking at earlier ages, 2) recent drunkenness and 3) more frequent, heavier drinking. They were also more likely to have partners that consumed alcohol before sex. Youth involved in violent relationships were more likely to drink alone or with a sexual partner than their counterparts. Solitary drinking among adolescents is problematic because it has been linked to alcohol dependence and depression in adulthood. These findings affirmed previous studies that found an association between violent intimate partner relationships, increased vulnerability to HIV and risky patterns of alcohol consumption.

Regarding sex practices, there were also significant differences between groups. IPV-involved youth were more likely to be sexually active. Moreover, sexually active youth were more likely to have an STI and/ or HIV and greater participation in commercial or transactional

sex than those in non-violent relationships. Similar to the bivariate findings for alcohol consumption, these findings largely confirmed the existing body of work (Sileo, Kintu, & Kiene, 2017). However, although inconsistent, IPV-involved youth reported using condoms more frequently than those in non-violent relationships. This finding was one of the more surprising results considering violent intimate relationship have largely been framed as a hindrance to condom use. However, within this population there was no statistical difference in consistent condom use between groups. Nonetheless, youth in non-violent relationships reported never wearing a condom more often than those involved in IPV. IPV- involved youth however, were more likely to report wearing a condom at least some of the time. These findings contradict previous studies that have found unprotected sex to be related to IPV involved, yet that assertion was not supported by this study.

Despite the bivariate analyses revealing significant relationships between IPV and high risk drinking and sexual practices, further analyses revealed that after controlling for covariates, HIV status, being a current drinker and exposure to childhood trauma were factors that significantly predicted IPV. Furthermore, after adjusting the model, drinking before sex was the only alcohol consumption pattern found to be associated with IPV-involvement. Similarly, of the factors entered into the sexual behavior model, HIV status and number of partners in the past 3 months were the only variables that significantly associated with IPV involvement. Exposure to parental violence remained a significant predictor in all models.

The results of the regression models were surprising as many of the associated factors considered important in the literature such as transactional sex, STI prevalence, heavy alcohol consumption and condom use were not consistent in this study population (Seth, et al, 2015;

Stockl, et al, 2014). This suggests that within this community there may be latent factors associated with IPV other than those identified in much of the existing literature.

To the best of our knowledge, there are no other studies that have examined the drinking patterns and subsequent sex behaviors associated with violent intimate relationships among slum-dwelling adolescents in sub-Saharan Africa. Contrarily, much of the work around behaviors associated with IPV have be conducted among older populations primarily from high-income countries. Albeit inconsistent with much of the current studies, these findings demonstrate the importance of examining the factors of associated with the SAVA syndemic within the context of specific high risk populations as not all established interaction pathways are equally correlated with violent intimate relationships. Understanding the specific mechanisms through which HIV, alcohol and IPV interact among highly vulnerable sub-Saharan youth are important to informing targeted prevention strategies within this population and others like them.

4.1 Limitations

A primary strength of this study was the examination of the risk factors associated with IPV among a largely understudied, vulnerable population. Additionally, the application of a syndemic framework to provide a broader understanding of not just the prevalence of violent relationships among these youth but also the additive risk posed by its interaction with drinking patterns and sexual behaviors. However, there were limitations that should be noted when interpreting the findings. The cross- sectional design of the study did not allow for causal inference, nor the assessment of which behaviors precipitated others. Because behaviors are not static, being able to measure the temporality of risk behaviors could provide a more informed understanding of the directionality of the interactions as well as elucidate how behavior and risk change over time. Another limitation of the study was the aggregate measure for intimate partner

violence involvement which did not differentiate between perpetration and victimization. Preliminary analyses of the data revealed that a significant percentage of the sample participants that were involved in IPV were experiencing mutual abuse whereby they were both a victim and perpetrator of violence within their relationship. Only small proportions of the sub-sample were 'only victims' or 'only perpetrators' thus making the sample size needed to assess the risk behaviors associated with victimization or perpetration too small Many studies have examined specific risk associated with violence perpetration and victimization separately. However, much of the literature suggest that many of the risk behaviors associated with violence perpetration were also associated with victimization. Yet, given the limited knowledge about IPV in this population the common risk between victims and perpetrators may or may not hold true. Examining the dynamics between victims and perpetrators among this population provides an opportunity for future research.

4.2 Conclusions and recommendations

The findings of this study support the findings of other studies that suggest IPV is an ongoing problem within adolescent relationships that place individuals at increased risk for HIV and high-risk drinking behaviors. However, there were finding that were incongruent with previous studies as well. Such incongruence suggests the need for a more thorough examination of the factors associated with IPV among slum-dwelling youth. Additionally, longitudinal studies that assess changes in behavior and risk over time would be useful in further informing intervention strategies within these communities. Lastly, little is known about IPV among vulnerable youth populations and even less is known how sexual assault manifest within these dynamics. Much of the literature around sexual assaults and related risk behaviors largely examine it outside of intimate relationships. However, considering most sexual assaults are

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perpetrated by acquaintances, and are a major pathway to HIV, it is an area that should be further

investigated.

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Table 1. Distribution of demographic characteristics by IPV involvement among adolescents in relationships among youth in the slums of Kampala (n=602)

		N (%)- Sample (1134)	IPV-Involved (223)	Not IPV-Involved (379)	p-value
Gender	Boy	497 (43.9)	94 (42.2)	163 (43.0)	
	Girl	636 (56.1)	129 (57.8)	216 (57.0)	.453
Age (years old)	12	47 (4.1)	1 (0.4)	1 (0.3)	
	13	72 (6.3)	1 (0.4)	6 (1.6)	
	14	118 (10.4)	8 (3.6)	18 (4.7)	
	15	136 (12.0)	19 (8.5)	34 (9.0)	
	16	161(14.2)	28(12.6)	58 (15.3)	
	17	254 (22.4)	69 (30.9)	100 (26.4)	
	18	346 (30.5)	97 (43.5)	162 (42.7)	.681
Ever Homeless	Yes	249 (22.0)	74(33.2)	81(21.4)	
	No	884 (78.0)	149(66.8)	298(78.6)	.001
Childhood exposure to IPV	Yes	325 (28.7)	104(46.6)	78(20.6)	
	No	805(71.0)	119 (53.4)	301 (79.4)	<.001
Experience Beatings	Yes	380 (33.5)	127 (57.0)	103(27.2)	
	No	749 (66.0)	96 (43.0)	275 (72.8)	<.001
Education	Never been	60 (5.4)	11 (4.9)	18(4.8)	
	Some/complete primary	600 (53.6)	103 (46.2)	177(47.5)	
	Some/complete secondary	443 (39.6)	107(48.0)	173(46.4)	
	Some/complete tertiary	17 (1.5)	2 (0.9)	5 (1.3)	.948
	Both parents alive	458 (40.4)	77 (34.5)	155(40.9)	
Parents Living	Both parents dead	251 (22.1)	55(24.7)	82 (21.6)	
	One parent living	425 (37.5)	91(40.8)	142(37.5)	.294
HIV Status	Yes	116 (10.2)	39(17.7)	29(7.7)	
	No	988 (87.1)	181(82.3)	347(92.3)	<.001
STI	Yes	419 (37.0)	122(54.7)	162 (42.7)	
	No	712 (63.0)	101(45.3)	217(57.3)	.003
Current Drinkers	Yes	346 (30.5)	130 (58.3)	144(38.1)	

	No	786 (69.3)	93(41.7)	234(61.9)	<.001
SES Rank	Low	472 (41.6)	67 (30.5)	130(35.0)	
	Med	280 (24.7)	59 (26.8)	85(22.9)	
	High	356 (31.4)	94 (42.7)	156(42.0)	.417

Table 2. Distribution of drinking behaviors by IPV involvement among adolescents in relationships among youth in the slums of Kampala (n=602)

		N (%)- (1,134)	IPV – Involved (223)	Not IPV- Involved (379)	p-value
Age of Initiation (among those that drink)	<12	58 (14.3)	21 (14.5)	18 (10.5)	
	13-14	116(28.6)	36 (24.8)	53 (30.8)	
	15-16	165 (40.7)	58 (40.1)	74 (43.0)	
	17-18	66 (16.3)	30 (20.6)	27 (15.7)	<.001
Alcohol Preference	Beer, lager	191 (55.0)	70 (53.8)	83 (57.2)	
	Wine	18 (5.2)	5 (3.8)	8 (5.5)	
	Local spirits	41 (11.8)	17 (13.1)	10(6.9)	
	Distilled spirits	78 (22.5)	33(25.4)	31(21.4)	
	Local brews	17(4.9)	5 (3.8)	11(7.6)	
	Other	2 (0.6)	0 (0.0)	2 (1.4)	
Drinking Companionship	Friends	253 (22.3)	90(69.2)	113 (77.9)	
	Family	26 (7.5)	5 (4.6)	15 (10.3)	
	Sexual Partner	38 (11.0)	22(16.9)	11 (7.6)	
	Others	6 (1.7)	2 (1.5)	2 (1.4)	
	I drink alone	24 (6.9)	10 (7.7)	4 (2.8)	.018
Age first drunk	14 or younger	103 (29.7)	39 (30.0)	36 (24.8)	
	15-18	198 (57.1)	83(63.8)	79(54.5)	
	Never	46 (13.3)	8 (6.2)	30(20.7)	.002
Drunk past month	Yes	278(80.0)	115(88.5)	106(73.6)	
	No	68(20.0)	5(11.5)	38 (26.4)	.001
Frequency of drinking	Occasionally	174 (50.3)	60(46.2)	83(57.6)	
	Often	128 (37.0)	47(36.2)	53(36.8)	
	Very often	44 (12.7)	23(17.7)	8(5.6)	.005
Number of drinks in typical day	1-2 drinks	195 (56.5)	66(50.8)	95(66.4)	
	3 or more	150(43.5)	64(49.2)	48 (33.6)	.006
Binge Drinking	Yes	242 (70.1)	98(75.4)	93(64.6)	
	No	103 (29.9)	32 (24.6)	51(35.4)	.035
Drink before sex	Yes	150(25.3)	79 (38.7)	43 (15.1)	
	No	443 (74.7)	125(61.3)	241(84.9)	<.001
Drink heavily before sex	Yes	75 (12.6)	39(19.1)	18 (6.3)	
	No	519 (87.4)	165(80.9)	267 (93.7)	<.001

		N (%)	IPV- Involved	Not IPV involved	p-value
Partner drink before sex	Yes	128 (11.3)	61(30.0)	44(15.4)	
	No	465 (41.0)	142 (70.0)	241(84.6)	<.001
Had sex with multiple partners due to alcohol	Never	229 (20.2)	74(56.9)	99(68.8)	
	1-2 times	68 (6.0)	34 (26.2)	28 (19.4)	
	3 or more times	49 (4.3)	22 (16.9)	17(11.8)	.127

Table 3. Distribution of HIV-related risk behavior by IPV involvement among adolescents in relationships among youth in the slums of Kampala (n=602)

		N (%)	IPV- Involved	Not IPV involved	p-value
Always used condom past 3 month	Yes	145 (24.5)	47 (23.0)	78 (27.5)	
	No	446 (75.5)	157(77.0)	206 (72.5)	.159
Number of partners past 3 months	1-2	302 (52.2)	67(33.3)	179 (63.3)	
	More than 2	277(47.8)	134(66.7)	104(36.7)	<.001
Frequency of condom use past 3 months	Always	145 (24.5)	47(23.0)	78(27.5)	
	Most of the time/sometime	235 (39.8)	107(52.5)	106 (37.3)	
	Never	211(35.7)	50 (24.5)	100(35.2)	.003
Number of lifetime partners	None	14 (2.4)	2 (1.0)	2 (0.7)	
	1-2	302 (50.9)	67(33.0)	179 (62.8)	
	3-4	151 (25.5)	73(36.0)	64 (22.5)	
	5 or more	126 (21.2)	61(30.0)	40 (14.0)	<.001
Sexually active (past 12 months)	Yes	594 (52.5)	192 (86.1)	255(67.3)	
	No	537 (47.5)	31 (13.9)	124 (32.7)	<.001
Ever told STI	Yes	419(37.0)	122 (54.7)	162 (42.7)	
	No	712 (63.0)	101 (45.3)	217 (57.3)	.003
Ever told HIV	Yes	116 (10.5)	39 (17.7)	29 (7.7)	
	No	988(89.5)	181 (82.3)	347 (92.3)	<.001
Condom last sex	Yes	392 (34.6)	132(64.7)	202(70.9)	
	No	202 (34.0)	71(35.3)	83(29.1)	.089
Commercial sex work	Yes	81 (13.7)	39 (19.2)	19(6.7)	
	No	509 (86.3)	164(80.8)	265 (93.3)	<.001
Transactional Sex	Yes	274 (24.2)	100(44.8)	98(25.9)	
	No	857 (75.8)	123(55.2)	281(74.1)	<.001

Table 4. Unadjusted and adjusted multinomial logistic regression analyses for various factors as predictors of intimate partner violence (IPV) involvement among youth in the slums of Kampala (N=602)

Characteristic		Unadjusted Model			Adjusted Model		
		OR	95% CI	Pvalue	AOR	95% CI	Pvalue
Ever Homeless	No	1.00			1.00		
	Yes	1.82	1.26-2.64		1.24	.822-1.88	.302
HIV Status	No	1.00			1.00		
	Yes	2.57	1.54-4.30		1.98	1.13-3.48	.016
STI	No	1.00			1.00		
	Yes	1.61	1.16- 2.25		1.40	.966-2.03	.075
Current Drinkers	No	1.00			1.00		
	Yes	2.72	1.62-3.18		1.57	1.08-2.30	.018
Exposure childhood violence	No	1.00			1.00		
	Yes	4.33	3.02-6.20		3.94	2.72-5.71	.000

Table 5. Unadjusted and adjusted multinomial logistic regression analyses for drinking patterns as predictors of intimate partner violence (IPV) involvement among youth in the slums of Kampala (n=602)

Characteristic		Unadjusted Model			Adjusted Model		
		OR	95% CI	Pvalue	AOR	95% CI	Pvalue
With whom do you usually drink	Sexual Partner/ alone Friends, family, others	1.00			1.00		
		.353	.18-.69	.002	.484	.23-1.01	.056
Age first drunk	15-18	1.00					
	14 or younger	1.03	.60-1.78	1.00			
Drunk past month	No	1.00			1.00		
	Yes	2.74	1.43-5.28	.002	1.37	.44-4.29	.587
Frequency of drinking	Often/Very often	1.00					
	Occasionally	.630	.39-1.01	.069			
	3 or more	1.00			1.00		

Characteristic		OR	95% CI	P-value	AOR	95% CI	P-value
Number of drinks in typical day	1-2 drinks	.521	.32-.85	.010	.632	.36-1.17	.632
Binge Drinking	No	1.00					
	Yes	1.67	.99-2.84	.065			
Drink before sex	No	1.00			1.00		
	Yes	3.54	2.30-5.44	.000	2.47	1.31-4.64	.005
Drink heavily before sex	No	1.00			1.00		
	Yes	3.50	1.94-6.33	.000	1.55	.71-3.41	.271
Partner drink before sex	No	1.00			1.00		
	Yes	2.35	1.51-3.65	.000	.779	.40-1.52	.465

Table 6. Unadjusted and adjusted multinomial logistic regression analyses for HIV-related risk behaviors as predictors of intimate partner violence (IPV) involvement among youth in the slums of Kampala (n=602)

Characteristic		Unadjusted Model			Adjusted Model		
		OR	95% CI	P-value	AOR	95% CI	P-value
Partners past 3 months	1-2	1.00			1.00		
	3 or more	3.43	2.35-5.02	.000	2.37	1.52-3.69	.000
Sexually active	No	1.00			1.00		
	Yes	3.01	1.94-4.65	.000	2.03	.873-4.74	.100
Ever told STI	No	1.00			1.00		
	Yes	1.61	1.16-2.25	.005	.863	.561-1.32	.504
HIV Status	No	1.00			1.00		
	Yes	2.57	1.54-4.30	.000	2.23	1.20-4.14	.011
Commercial sex work	No	1.00			1.00		
	Yes	3.31	1.85-5.93	.000	1.46	.725-2.94	.287
Transactional Sex	No	1.00			1.00		
	Yes	2.33	1.64-3.30	.000	1.46	.926-2.31	.103

Conclusion

The primary aim of the included studies were twofold: (1) to describe high risk sexual behaviors and alcohol consumption and violence exposure; and (2) to examine the synergistic relationship between HIV, alcohol use and violence among youth living in slum communities in Kampala, Uganda.

The first study aimed to identify the socio-cognitive correlates associated with sexual abstinence among older, adolescents living within slums in Kampala. The results revealed that after controlling for confounding variables, sexual abstainers were significantly different demographically and socio-cognitively from their non-abstainers counterparts. In general, abstainers were more likely to be female; not involved in a romantic relationship; have living parents; and have more housing stability than sexually active youth. They also differed in HIV related attitudes about sex, as abstainers held more positive attitudes towards condom use and believed HIV to be a serious health issue for people their age. Perceived norms were associated with perception of their friends' intentions to delay sex, and parental disapproval of sex were found to be highly protective against for sexual activity. Sex- related intentions and self-efficacy were also closely associated with sexual activity. As hypothesized, intentions to not have sex in the future 6 months was strongly associated with sexual abstinence. Confidence in the ability to avoid situations that encourage sex was also associated with abstinence. However, sexual abstainers were found to be confident in their ability to utilize non-sexual displays of affection. Regarding other risk-related correlates, abstainers and sexually active youth did not significantly differ in many of their drinking behaviors or violence exposure. Both sexual abstainers and non-

abstainers demonstrated similar drinking patterns. However, sexually active youth were more likely to have experienced drunkenness.

The purpose of the second study was to examine the association between perceptions of community cohesion and HIV status, alcohol consumption patterns and high-risk sexual behaviors. The analyses revealed that drinking patterns differed significantly across levels of community cohesion. After controlling for confounding factors, adolescents that reported higher levels of cohesion with their community were less likely to drink alcohol, get drunk, and consume alcohol before sex. High community cohesion was protective for HIV-related sexual risk behaviors as well. Youth with higher levels of community cohesion were significantly less likely to engage in transactional sex, have multiple partners and inconsistently condom use.

The final study assessed HIV and STI- risk, and describes the alcohol consumption patterns and sexual behaviors associated with involvement in intimate partner violence. The results showed that demographically, youth involved in violent romantic relationships were similar to those that were not. However, IPV-involved youth reported more homelessness and exposure to violent childhood trauma. They were also more likely to: 1) initiate drinking alcohol at younger ages, 2) engage in solitary drinking, 3) be drunk and 4) drink more frequently and heavier than those not in violent relationships. IPV- involvement was also associated with having a partner that drank alcohol before sex.

The 3 studies had a number of limitations, pertaining to the overarching methodology as well as some that were study- specific. Using data from the 2014 Kampala Youth Survey allowed for the assessment of a broad range of health outcomes and behaviors among this vulnerable population, however its cross-sectional design has inherent limits. The ability to draw causal inferences from the associations highlighted by the results of all three of the studies are

limited by this design. Another limitation was that many of behaviors queried by participants required the recollection of past events, and/ or behaviors as far back as 12 months. The reliance on memories to identify minute behaviors (e.g. a single drink within the past 12 months) may have contributed to underreporting some behaviors due to recall bias. The targeted population for the survey was based on convenience sample of adolescents surrounding the UYDEL drop-in center on the days of data collection. Due to the exploratory nature of the study, this provided an effective means of collecting data within a largely under researched population. However, utilizing the convenience sampling technique reduces the generalizability of the results because of the potential for selection bias and sampling error. Lastly, due to the presumed low literacy rate within the sample, interviewers read the survey items aloud to participants. The sensitive nature of the questions may have resulted in underreporting their actual behaviors due to social desirability bias.

In addition to the shared methodological limitations found across the three studies, each also had operational definitions specific to their aims that presented limitations. In the first study, sexual activity status was defined as 'abstainers' and 'non-abstainers'. While abstainers were participants that reported never having had sexual intercourse, 'non-abstainer' described anyone that reported ever having sex in their lifetime. This included 'secondary abstainers', those that had engaged in sexual intercourse before but reported not having done so within the past 12 months. While preliminary analyses were conducted to assess statistical differences between them and sexually active youth on several socio-cognitive factors, none were found. It is debatable as to whether 'secondary abstainers', are more similar to sexually active participants or sexual abstainers, and thus whether their characteristics are distinct enough to convolute the findings.

In the second study, participants risk of HIV and related-risk behaviors were assessed based on their perception of the levels of their community. This study relied on a composite score of 4 measures related to community cohesiveness ranging from 0 to 4. Scores were then converted into a binary category with score of 3 to 4 being categorized as 'high' and less than 3 grouped as 'low' cohesiveness. However, these distinctions are a bit of a misnomer, as the difference in cohesion between a score of 2 and 3 is somewhat arbitrary. As such interpretations of the results should be careful not to overstate the distinction between groups. Furthermore, because the study only examined a single construct for community efficacy interpretation of the influence of this construct should be interpreted cautiously.

Finally, in the third study a primary limitation is the operationalization of the outcome variable, 'IPV involvement'. In aiming to assess differences in risk behaviors and patterns between youth exposed and not exposed to IPV within their relationships, the dependent variable, did not distinguish between perpetrators or victims of violence. Instead all participants reporting being involved in relationships in which violence was occurring were grouped together. This approach was taken as a result of preliminary analyses that revealed that the majority of the youth involved in violent relationships were engaged in mutual violence (i.e. both were perpetrating and victims). The sample size for participants that were 'only victims' or 'only perpetrators' was too small to discern valid effect sizes. Although, previous studies have shown that victims and perpetrators of IPV often share similar risk factors, there are also factors that are distinct enough to each role that could potentially impact the findings (Lorenz & Ullman, 2016). Additionally, this study did not differentiate between various forms of IPV. Physical and sexual violence were grouped within the same variable. Although, there is a paucity of research

specifically examining sexual assault within intimate partnerships, there could be potential for distinct interactions between sexual violence within relationship and the study explanatory variables that could influence the findings.

The results of the studies presented findings that were both consistent and inconsistent with the existing body of research in the field. In the first study, attitudes towards HIV-prevention, descriptive norms and injunctive norms and intentions and self-efficacy were all correlated with sexual activity. Many of the findings were consistent with those of previous studies. A robust body of literature has established norms and intentions as strong predictors of sexual activity (Bell et al., 2008; Buhi & Goodson, 2007; Cort et al., 2016; Dittus & Jaccard, 2000; Kabiru & Ezeh, 2007; Leerlooijer et al., 2014; Marston et al., 2013, Taffa, Klepp, Sundby, & Bjune, 2002). In this study similar results were found with descriptive and injunctive norms that encourage abstinence. Similarly, as established by the literature, intentions to delay sex were closely associated with sexual abstinence. This study showed resistive self-efficacy was highest among sexual abstainers. However, there are a limited number of studies examining the role of self-efficacy in predicting sexual abstinence and of those that do it has been shown to be inconsistent among populations (Buhi & Goodson, 2007). But among this sample the results affirmed the findings that showed it to be protective for sexual activity. One of the more surprising results of this study revealed that after controlling for covariates, consuming alcohol and binge drinking was not associated with sexual behavior. Considering alcohol use is widely established as a stable predictor for sexual activity, within this sample of older adolescents there was not a significant association (Blum et al., n.d.; Buhi & Goodson, 2007; Cleveland, Feinberg, Bontempo, & Greenberg, 2008; Lakshmi, Gupta, & Kumar, 2007). Binge drinking has been shown to be associated with sexual behaviors and HIV- risk. However, within this study sample

drunkenness was an alcohol consumption pattern more closely related to sexual activity. This suggest that there are possibly normative practices involving heavy episodic drinking experienced by both, sexual abstainers and non-abstainers. However, despite the prevalence of binge drinking among this sample, it would seem that it is inebriation that increases youths' risk of engaging in sexual activity.

The results of the second study affirmed many of the findings from previous studies. Adolescents with high levels of community cohesion reported fewer HIV-related sexual practices, and fewer alcohol-related risk behaviors. The role of community-level factors on SAVA- related risk is a largely underdeveloped area of research. However, studies examining community dynamics have shown social cohesion to be both a protective and a risk factor for HIV and related behaviors (Pronyk et al., 2008; Schiefer & van der Noll, 2017; Smylie et al., 2006). In this study findings showed community cohesion to be protective for some HIV-related risk. However, after controlling for confounding effects, community cohesion was not associated with STIs or HIV, nor was there an association with condom use which were factors that have been found to be strongly associated with community cohesion in other studies.

Lastly, the third study investigated drinking patterns and sexual risk behaviors among adolescents involved in intimate partner violence. Like the other two studies, the results of the study revealed findings that were both consistent and inconsistent with the existing literature. After controlling for the effects of covariates, involvement in a violent intimate relationship significantly predicted HIV status, being a current drinker, drinking before sex, and having multiple sex partners. These finding were largely expected as there is a well-established body of literature that have found them to be correlated with disinhibition due to alcohol may induce intimate partner violence and sexual coercion and increased risk of HIV infection. In a sample of

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3,422 women aged 15–24 from the Rakai cohort, Uganda, we examined the association between self-reported alcohol use before sex, physical violence/sexual coercion in the past and prevalent HIV, using adjusted odds ratios (AOR) and 95% confidence intervals (95% CI). During the previous year, physical violence (26.9%) and sexual coercion (13.4%) were common, and alcohol use before sex was associated with a higher risk of physical violence/sexual coercion. HIV prevalence was significantly higher with alcohol consumption before sex (Adj OR = 1.45, 95% CI: 1.06–1.98) and especially when women reported both prior sexual coercion and alcohol use before sex (Adj OR = 1.79, 95% CI: 1.25–2.56). Alcohol use before sex was associated with physical violence and sexual coercion, and both are jointly associated with HIV infection risk in young women (Zablotska et al., 2007;Zablotska, Gray, Koenig, Serwadda, Nalugoda, Kigozi, Sewankambo, Lutalo, Mangen & Wawer, 2009; Watts, & Heise, 2014, van de Berg, Fernandez, Fava, Operario, Rudy, & Wilson, 2017; Seth, Wingood, Robinson, Raiford, & DiClemente, 2014, Gilbert, et al., 2015; Stockl, et al., 2014) . However, it was not expected that factors that were found to be highly correlated with IPV in previous studies would not be significant in this study. Although, HIV was found to be associated with IPV involvement, STI risk was not. Research has found that individuals involved in IPV were at increased risk of contracting an STI. This was largely attributed to the increased likelihood of engaging with riskier partners. Also IPV across numerous studies, has been shown to be an impediment to safe sex practices (Seth, Wingood, Robinson, Raiford, & DiClemente, 2014; Gilbert, et al., 2015; Stockl, et al., 2014). However, the logistic regression in this study revealed no significant association within condom use. Binge drinking, drunkenness and the frequent alcohol consumption showed no significant relationship with IPV despite associations being found in other studies.

The results of these finding identified various dimensions of the SAVA syndemic among youth living in slum communities. Each study elucidates a mechanism, within a pathway that drives the interconnectedness of HIV, alcohol and violence in this study population. The focus of the studies were different however, they each identified elements that relate to the bi-directional pathways between HIV, alcohol use and violence. The first and third studies identified individual and interpersonal- level correlates associated with SAVA risk. While the first study identified psycho-cognitive determinates for sexual activity, the third study identified behavioral patterns associated with involvement in violent relationships. The second study provided a link between individual-level factors and community level risk that contribute to the SAVA syndemic. These pathways add to increased susceptibility towards the occurrence of HIV, alcohol use and violence among these youth.

These study findings highlight the complexities of the SAVA syndemic and its related pathways. Many of the results affirmed the research of other studies examining the association with SAVA-related risk behaviors. However, there were also as many findings that did not. The findings that affirmed the existing literature provides further support for the development of integrated interventions. While those t results that differ demonstrate the multi-factorial nature of the syndemic within varied populations and the pressing need for additional research in the field. Examining the SAVA syndemic among youth that live in slums requires that such research take into consideration the influence of the context as an important factor related to risk. These findings as well as the results of previous studies elucidate the importance of developing integrated interventions strategies which incorporate alcohol use and violence into the continuum of HIV prevention strategies. The past several years have shown immense growth in HIV interventions that integrate violence prevention, more specifically gender based violence.

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However, there are far fewer models that incorporate a targeted approach to alcohol use. The interventions that address HIV-prevention through such an approach are limited in number despite research that suggests that such a strategy presents the best opportunity for holistic risk reduction among vulnerable populations (Gilbert, et al., 2015). Furthermore, in addition to addressing risk behaviors at the individual-level, progress towards reversing the driving mechanism of the SAVA syndemic efforts must be targeted toward implementing population levels strategies as well. Community-level initiatives and structural interventions which address the intersectional determinants associated with SAVA have shown promising effects. More multi-leveled integrated structural interventions targeting salient drivers for the syndemic are needed.

The existing research around HIV-related risk and prevention have largely focused on its occurrence singularly. Only in recent years have there been a concerted effort to recognize the link between the proliferation of the HIV epidemic and related conditions. The SAVA framework emerged from efforts to develop a more holistic understanding of the way HIV and related conditions interact to catalyze and exacerbate their impact on populations. Integrated SAVA research has made important contributions to illuminating the complexities of the syndemic pathways and the mechanisms that drive their interaction. Significant strides have been made in research to describe the behavioral and contextual conduits that facilitate its proliferation, but additional work is needed. There are significant knowledge gaps regarding the means through which SAVA pathways catalyze and proliferate the spread of HIV in sub-Saharan Africa, particularly among vulnerable communities such as sex workers, slum-dwellers, drug-users and LGBTQIA populations. Also, despite the innumerable studies that have examined HIV-related risk factors there remains a paucity of knowledge of protective factors that reduce

risk. Further efforts should be made to elucidate not only mechanisms that put populations at risk but also those that protect against them.

The first study, aimed to contribute to the body of knowledge in this area by identifying psychosocial protective correlates among an under researched population. More often research has focused on predicting risk behaviors among the sexually active but this study identified the factors that have contributed to reduced risk within the same context. Such findings can serve to inform interventions which incorporate strategies to change attitudes, norms and intentions as they relate to SAVA- risk behaviors. Additionally, because studies have typically focused on risk behaviors, individuals not engaged in the behaviors are often not a consideration in the development of such interventions. Integrating components that address target not only the reduction of risk behaviors but also the delay of initiation can be helpful as well. Community-level contributors to HIV risk have been grossly underexplored.

Although there is an emergence of research connecting the link between community factors and SAVA- related risk, the field is still in its infancy. Much of the existing literature have examined this relationship in urban communities in the United States. Fewer studies have investigated community dynamics as a contextual influencer for SAVA related risk in sub-Saharan Africa. The findings of the second study aimed to contribute to building the knowledge base in understanding the impact of environmental and community- level factors on syndemic risk behaviors among youth in the region. Findings from the second study highlight community dynamics as an important mechanisms that contributes to SAVA-risk. Furthermore, these findings suggest that implementing strategies to bolster community cohesion could serve to facilitate the uptake of behavioral prevention approaches. Intimate partner violence-related research has largely focused on adult populations, particularly those in Western countries.

Considering the immense burden of HIV and IPV prevalence in sub- Saharan Africa, a large gap exists in our understanding of their occurrence among youth populations. Lastly, the vast majority of the current discourse in understanding the role of IPV as a pathway to HIV and alcohol use has been largely framed around adult relationships. Until recent years, IPV was framed as a risk factor impacting individuals 15 years and older. However, emerging evidence has shown that violence in relationships is prevalent among adolescents as well. Yet, behavioral risks associated with adolescent IPV have not been well-documented particularly among youth in sub-Saharan Africa. By describing the patterns of high –risk sex and drinking behavior associated with adolescent IPV, the third study served to contribute to the epidemiological knowledge of SAVA risk as they relate to these relationships. The findings from this study can help inform structural interventions aimed at addressing SAVA risk within this population.

The SAVA syndemic poses a significant threat to global health. Sub-Saharan youth are disproportionately impacted by its impact and its burden is expected to worsen in the future. While the last decade has ushered in immense growth in SAVA syndemic research there is still a scantiness in knowledge surrounding the nuances of its complex pathways and how they manifest within various populations. Adolescents in sub- Saharan Africa have been largely absent from syndemic literature. The findings from these included studies aimed to not only explicate factors associated with HIV, alcohol and violence, but together they affirmed the findings of previous studies which illustrate the interconnected relationship between them. Despite the significance of these findings, additional research is needed in this area. Longitudinal studies that examine risk behaviors and related factors across the life span are need to move beyond correlational inferences towards attributing causality. Additionally, more research is broadly needed to further examine how SAVA and its related risk manifest within adolescent

populations, particularly in vulnerable communities. Alcohol and HIV-risk behaviors have long

been explored among youth populations however, there is much needed research in nearly all

aspects of IPV and its associated risk among youth.

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