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Socio-Economic Determinants of Risky Sexual Behavior in sub-Saharan Africa

Frida Tende
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Walden University

College of Health Sciences

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Frida Tende

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2020

Abstract

Socio-Economic Determinants of Risky Sexual Behavior in sub-Saharan Africa

by

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MPH/MPA, University of Alabama at Birmingham, 2013

BS, University of Alabama at Birmingham, 2010

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Public Health

Walden University

August 2020

Abstract

Risky sexual behavior (RSB) is a major public health concern due to health outcomes, such as HIV/AIDS, sexually transmitted infections, and unwanted pregnancies. RSB has been identified as 1 of the main components contributing to the high HIV incidence rate in sub-Saharan Africa. The purpose of the current research was to investigate RSB and its association with education and economic status among men and women in 3 sub-Saharan African countries (i.e., Rwanda, Zimbabwe, and Cameroon) while controlling for gender, age, religion, and place of residence. The social cognitive theory provided the framework for this cross-sectional study that included data from the Demographic Health Survey (2011–2015), with a total combined sample size of 39,052 participants. Regression analysis revealed that the odds of people engaging in high RSB was greater for Cameroon ($OR = 1.518$, 95% CI = 1.267-1.913) and for rural areas ($OR = 1.373$, 95% CI = 1.150-1.639), while the odds of engaging in RSB was lower for the richest ($OR = 0.702$, 95% CI = 0.545-0.904), for those with higher education ($OR = 0.214$, 95% CI = 0.119-0.387), and for 35–49 age group ($OR = 0.380$, 95% CI = 0.310-0.465). The findings of this study can be used to provide a better understanding of RSB determinants, contributing to HIV/AIDS prevention practice, and estimating the socio-economic gap in RSB. Policy makers should design programs for specific countries that are aimed at enabling communities to limit RSB and make healthier choices in their sex lives.

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Dedication

I dedicate this to my mother who has pushed me harder than I could have ever done by myself. Secondly, my older brother (Dr. Alan) and Wife (Mrs Ozong) for being my adopted parents and taking total control of my educational and career growth. They saw to it that I got the best education and incredible mentorship. I also want to dedicate this to the rest of my family and my friends who continue to encourage me in all my endeavors.

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Data for this study were collected from the Demographic Health Survey (DHS), which is administered by USAID.

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Section 1: Foundation of the Study and Literature Review

Risky sexual behavior (RSB) is a major public health concern. Consequences of RSB include unwanted pregnancies; abortion; and sexually transmitted diseases, (STDs) such as HIV (Ross, Duperrouzel, Vega, & Gonzalez, 2016). According to the World Health Organization (WHO, 2018), 36.9 million people were living with HIV globally in 2017, with 25.7 million of this population living in Africa. Several researchers have reported that economic and educational factors play a significant role in the engagement in RSB (Berhan & Berhan, 2015; Kongyuy et al., 2006; Mavhu et al., 2018; Odimegwu, De Wet, & Banda, 2016). In this study, I examined the association of economic empowerment/educational level and engaging in RSB in three sub-Saharan African countries based on age, gender, region, religion, and the availability of data. I extracted data concerning Cameroon, Rwanda, and Zimbabwe from the Demographic Health Survey (DHS). It is important to understand the factors behind RSB in this population to be able to make informed policy decisions. This section comprises the following subsections: (a) the problem statement; (b) the purpose of the study; (c) research questions and hypotheses; (d) the theoretical framework of the study; (e) the literature review; (f) the nature of the study; (g) terms used in the study; (h) study assumptions; (i) scope and delimitations; (j) limitations; (k) significance; (l) implications for social change; and (m) a summary and conclusion.

Problem Statement

Sexual health behavior education is essential in public health because of its health benefits to both men and women, such as preventing HIV infections and other sexually

transmitted infections, particularly in sub-Saharan Africa, which has a high HIV prevalence rate (Jewkes, 2010; Sani, Abraham, Denford, & Ball, 2016). RSB has been identified as one of the main components contributing to the high HIV incidence rate in sub-Saharan Africa (Berhan & Berhan, 2015; Dintwa, 2012; Maonga, Gondwe, & Machira, 2018; Odimegwu et al., 2016). For example, according to a UNAIDS (2016) report, condom use is very low among adults with multiple sexual partners, estimated at 23% among men and 33% among women. Some of these behaviors include having multiple sexual partners, intergenerational sex, inconsistent condom use, early sexual debut, sex and drugs, and transactional sex, among others.

In recent years, researchers have mainly focused on female sexuality in Africa, which is partly attributed to the fact that economic limitations, like poverty and poor educational background, have been found to influence the engagement of women in RSB, leading to the disproportionate burden of new HIV infections among female adolescents and young women (Ayesha & Karim, 2016; Choudry et al., 2014; Miller et al., 2016). On the other hand, researchers have also found that wealthy men exhibit RSB through keeping multiple sexual partners compared to economically impoverished men (Kongnyuy, Wiysonge, Mbu, Nana, & Kouam, 2006). Similarly, Berhan and Berhan (2016) found that among 26 countries studied, male youths were more susceptible to high risk sex than females in all countries. Researchers have also focused on RSB among youths due to this population's experimentation in high risk behaviors and exploitation of a range of different activities (Gebremedhin et al., 2013). Even though the vulnerability

to RSB may vary across gender and age group, it is important to understand these factors to implement informed policy decisions.

In sub-Saharan Africa, HIV/AIDS continues to be a major public health problem mostly due to high RSB, and nobody has been spared from this pandemic despite decades of treatment and care. The HIV prevalence among young women (i.e., aged 15–24 years old) is double that of young men due to high levels of transactional sex, financial deprivation, and age-disparate sexual relationships (UNICEF, 2015). Several studies have indicated that women are particularly vulnerable to RSB compared to men, leading to the high HIV incidence rate among women (Mavhu et al., 2018; Odimegwu et al., 2016). In sub-Saharan Africa where over 70% of all new HIV infections occur, women and young adolescent girls bear a disproportionate burden of the infection; however, to date, there is paucity of studies to investigate and explain RSB by gender in Africa (Berhan & Berhan, 2015; Kongnyuy et al., 2006; Mavhu et al., 2018; Odimegwu et al., 2016).

The insinuation that poverty or low economic status is the main contributor of women's engagement in RSB has been widely examined (Amoateng et al., 2014; Dintwa, 2012; Mishra et al., 2007; Uchudi, Magadi, & Mostazir, 2012), while other researchers have factored in wealth and higher education as a contributing component to men's RSB (Berhan & Berhan, 2015; Kongnyuy et al., 2006). There is a lack of studies investigating the gender gap in RSB influenced by economic and educational status; therefore, the purpose of this study was to examine if economic and educational status are associated with RSB among women and men as well as if religion and/or geographic region have an effect on RSB.

Purpose of the Study

The health outcomes of RSB may include HIV/AIDs or other STDs that can impact public health and the population's quality of life. The purpose of this study was to investigate RSB and its association with education and economic status among men and women in three sub-Saharan African countries (i.e., Rwanda, Zimbabwe, and Cameroon) and determine if there is any religion and/or geographical gap in RSB.

Research Questions and Hypotheses

RQ1: Is there an association between socioeconomic status (SES) and RSB among men and women in sub-Saharan Africa?

H_01 : There is no significant association between SES and RSB in sub-Saharan Africa.

H_a1 : There is a significant association between SES and RSB in sub-Saharan Africa.

The independent variable was SES (i.e., wealth index and educational level); the dependent variable was RSB; and the control variables were gender, age, country, and location (i.e., rural versus urban).

RQ2: Is there an association between country of origin and RSB among men and women in sub-Saharan Africa?

H_02 : There is no significant association between country and RSB.

H_a2 : There is a significant association between country and RSB.

The independent variable was country of origin; the dependent variable was RSB; and the control variables were gender, SES (i.e., wealth index and educational level), age, and location (i.e., urban versus rural).

RQ3: Is there an association between religion and RSB in sub-Saharan Africa?

H₀₃: Religion has no significant association with RSB in sub-Saharan Africa.

H_{a3}: Religion has a significant association with RSB in sub-Saharan Africa.

The independent variable was religion; the dependent variable was RSB; and the control variables were SES (i.e., wealth index and educational level), age, country, and location (i.e., urban versus rural).

Theoretical Foundation for the Study

I used the social cognitive theory (SCT), previously known as the social learning theory as the theoretical foundation for this study. According to Bandura (1977), the SCT focuses on how people learn through observing others. This theory can be used to address RSB and how individual's interaction with their environment can influence their decisions (Glanz, Rimer, & Vizwanath, 2008). SCT is composed of three factors that may influence a person's behavior: the environment, the individual, and the behavior (Bandura, 1996). This interaction between environment, individual, and behavior is the premise of the SCT, which stipulates that an individual's behavior and environment can have a major influence on their behavior (Bandura, 1986). Using the SCT in this study,

my focus was examining real-world social factors (i.e., economic status and educational level) to understand the dynamics of RSB in an African context.

SCT has been widely used to explain sexual risk behaviors. The SCT posits that through a cognitive process, an individual weighs the pros and cons of practicing risky sex (e.g., knowledge about HIV/STDs, condom use, multiple sexual partners, etc.), which may influence their self-efficacy (i.e., having the confidence to practice safer sex in certain situations; Safren et al., 2010). Snead et al. (2014) conducted a study in which approximately 38,635 clinic patients viewed either a “safer sex” video or received a regular waiting room experience. The researchers examined the relationship among SCT constructs and self-reported condom use at last sex act and found that 39% reported using condoms at last sex act and indicated that sexual self-efficacy (adjusted relative risk [RRA] = 1.50, 95% CI 1.23 to 1.84), self-control self-efficacy (RRA = 1.67, 95% CI 1.37 to 2.04), self-efficacy with most recent partner (RRA = 2.56, 95% CI 2.01 to 3.27), more favorable hedonistic outcome expectancies (RRA = 1.83, 95% CI 1.54 to 2.17) and more favorable partner expected outcomes (RRA = 9.74, 95% CI 3.21 to 29.57) were significantly associated with condom use at last sex act. In consequence, self-efficacy becomes an instrument in determining if individuals will engage in RSB. Therefore, in this study, I examined the role of economic empowerment and educational level within the context of self-efficacy to predict RSB in sub-Saharan Africa.

Nature of the Study

In this quantitative study, I used secondary data from the DHS conducted between January 1st, 2011 and December 31st, 2015. The DHS covers an extensive list of topics

on risk behaviors and includes the economic and educational status of sub-Saharan African participants and collected data from three countries: Cameroon, Rwanda, and Zimbabwe. Participants are Black males and females between the ages 15–49 years old residing in both urban and rural areas of these three countries (2011 Cameroon DHS; 2014-2015 Rwanda DHS; and 2015 Zimbabwe DHS). These secondary data were analyzed to understand if RSB is related to economic and education factors and, if so, its impact on public health. As previously discussed, RSB is associated with poverty and significant correlates with high HIV prevalence and incidence rates. This is the first study to compare the RSB of men and women based on economic and educational factors in these three sub-Saharan African countries. Hopefully, the findings of this study can draw more light to policy intervention strategies to prevent infectious diseases, such as HIV/AIDS.

Literature Search Strategy

Pubmed, Google Scholar, and Cochrane were the main databases used to locate journal articles for the literature review. I used keyword search terms, such as *risky sexual behavior, HIV, sub-Saharan Africa, economic status, educational level, transactional sex, multiple sexual partners, no condom use, early sexual debut, intergenerational sex, sexually transmitted diseases, Cameroon, Zimbabwe, and Rwanda*, to find relevant literature on the topic. These keyword terms were combined with regular keywords from PubMed, Google Scholar, and Cochrane databases. The search was limited to articles published between 2009 and 2020.

Literature Review

In this subsection, I examine the literature related to the association of RSB with economic and educational status. I also review the covariates of the study, including age, geographic location, and gender. This literature review was used to establish and describe the gap in the literature relating to RSB.

Reviewing RSB and Socioeconomic Status in sub-Saharan Africa

RSB is defined by some researchers as an action that increases an individual's exposure to HIV/AIDS and other STDs due to sex without using any form of protection, having multiple sexual partners, early sexual debut, and transactional sex or engaging in any behavior that puts an individual at risk of contracting STDs (Berhan & Berhan, 2015; Choudry et al, 2014; Ishida et al., 2011; Lowry, Dunville, Robin, & Kann, 2017; Wamoyi et al., 2016;). RSB is a major public health problem because it is a key factor driving the HIV/AIDS epidemic, especially in sub-Saharan Africa (Lucas & Wilson, 2018; Odimegwu et al; 2016; Odimegwu, Somefun, & Chisumpa, 2019).

The consequences of RSB include, but are not limited to HIV/AIDS, unwanted pregnancy, and unsafe abortions. Even though trends suggest an increase in condom use over the past years, adolescents and young adults continue to engage in unprotected sex, accounting for half of the STDs (Torrone et al., 2018) and a high proportion of the HIV infections in sub-Saharan Africa compared to other regions (WHO, 2018). Even though strong gains against HIV have been achieved in sub-Saharan Africa, the region is still home to more than 60% of the world's 36.9 million people living with HIV, with 9.6 million living in East and Southern Africa and an incidence rate of 800,000 new

infections in 2017 (Avert, 2018; USAID, 2018). The era of HIV/AIDS has placed a serious economic and social burden on governments and individuals, so it is important to understand the factors propagating RSB, the preliminary driver of HIV/AIDS in sub-Saharan Africa (Lucas & Wilson, 2018). Sexual risk behaviors have been properly documented across sub-Saharan Africa, including in Zimbabwe, Nigeria, Rwanda, South Africa, Kenya, Democratic Republic of Congo, Chad, Cameroon, and many others (Adedimeji et al., 2019; Berhan & Berhan, 2015; Kongnyuy et al., 2006; Marume, Marazika, & January, 2018; Odimegwu & Sumefun, 2017; Pengpid, Peltzer, & Skaal, 2012; Ziraba et al., 2018,).

RSB limit the prevention of HIV and STDs. Adolescents and women are more at risk of acquiring STDs and HIV due to engagement in unsafe sexual activities (Berhan & Berhan, 2015; Gebremedhin et al., 2013; Mavhu et al., 2018; Morris et al., 2014; Odimegwu & Somefun, 2017). Other researchers have cited transactional sex and early sexual initiation as a risk factor for HIV/AIDS in sub-Saharan Africa (Durowade et al., 2017; Ekundayo et al., 2007; Kilburn et al., 2018). Therefore, it is important to frame policy interventions that target these vulnerable groups and reduce risk behaviors.

Researchers have found that these behaviors vary by gender and geographic location as well as the HIV incidence and prevalence rate (Chatterji et al., 2005; Kharsany & Karim, 2016; Odimegwu et al., 2016). For example, Ringheim and Gribble (2010) found that males were more likely to use condoms than females in sub-Saharan Africa, which may be as result of poverty affecting women, reducing their power to bargain for safer sex. This is consistent with other findings in sub-Saharan Africa where

there is a gender parity in condom use and women are disadvantaged (Macpherson et al., 2014; Odimegwu et al., 2016; Odimegwu & Somefun, 2017; Ramjee & Daniels, 2013; Ziraba et al., 2018). This can also be seen in the HIV/AIDS prevalence and incidence gap among women and men globally, most especially in sub-Saharan Africa.

The complexity of determinants of high-risk sexual behavior is exemplified by the contrasting arguments on the role of economic status and education. As stated earlier, per global and regional statistics, women and young adults are disproportionately vulnerable to the HIV virus; while some studies have shown a positive, significant association between poverty, low education, and RSB (Madise, Zulu, & Ciera, 2019; Tanga & Tangwe, 2014), other researchers have found a positive, significant association between high income, high education level, and sexual risk-taking behavior, most especially at individual levels (Berhan & Berhan, 2015; Kongnyuy et al., 2006). Researchers from other schools of thought have claimed that there is no significant association between socioeconomic status and RSB; however, if examined on a global perspective, HIV/AIDS has mostly affected poorer countries. This assertion is not true when looking at individual national statistics though. For example, countries like South Africa, Botswana, and Nigeria, which have the richest economies in Africa, have some of the highest HIV prevalence and incidence rates (Avert, 2018, 2019).

Researchers have demonstrated a relationship between RSB, high income, and high level of education, suggesting that an increase in income or education may increase vulnerability to RSB and a possible HIV infection and/or other STDs (Awusabo-Asare & Annim, 2008; Berhan & Berhan, 2012; Kongnyuy et al., 2005; Odimegwu et al., 2016).

In their study assessing the association between RSB and level of education and economic status among male youths in developing countries, Berhan and Behran (2015) found that male youths with a postsecondary education and higher income were more likely to engage in higher risk sex and be vulnerable to HIV infection. This is consistent with findings from other studies (i.e., Berhan & Berhan, 2012; Dintwa, 2012; Kongnyuy et al., 2005; Maonga et al., 2014). After analyzing the higher-risk sexual behavior of women in 28 developing countries, Berhan and Berhan (2012) found that wealthy women who had a secondary level education or above were more likely to engage in risky sex compared to their female counterparts. Findings from a study in Cameroon also showed that economic empowerment was strongly associated with multiple sexual partners and that unsafe sexual behavior or inconsistent condom use became more common with increasing level of education (Kongnyuy et al., 2006). Kongnyuy et al. (2006) observed that compared to poor men, rich men were less likely to use condoms, more likely to start sexual activity at an early age, and more likely to have had more than five lifetime partners. Mitsunaga, Powell, Heard, and Larsen (2005) reported similar findings that wealthy men are more likely to seek sex outside of their marital homes compared to their poor counterparts.

Choudry et al. (2014) noted that women in developed countries also have multiple sexual partners and engage in intergenerational sex for luxury goods, indicating that RSB is not only limited to women in low-income countries. Analyzing RSB in four sub-Saharan African countries, Odimegwu et al. (2016) found that a high number of economically empowered females under 20 years old engaged in multiple sexual

relationships without condoms. This finding is consistent with those of Maluleke (2010) who found that young girls with postprimary education and life-skills indicated having multiple sexual partners without using a condom. This trend can be explained by the fact that educated and empowered people travel often and may have disposable income compared to uneducated individuals, increasing their likelihood to engage in RSB, such as having multiple partners. This is consistent with findings from other studies as well (Hadish et al., 2017; Kongnyuy & Wiysonge, 2007).

After the consequences of AIDS were recognized in the late 1980s, individuals with higher levels of education were thought to be better at practicing safer sex due to their accessibility to information and healthcare (De Walque et al., 2005; Hargreaves et al., 2008). Unfortunately, this is not the case because researchers have found a significant association between high level education and RSB (Berhan & Berhan, 2012). Conversely, Gillespie et al. (2007) reported an association between SES and HIV infection and that poor individuals were not as at risk of HIV infection compared to their wealthy and educated counterparts. According to the Cameroon Demographic Survey of 2004, HIV prevalence in the adult population was significantly higher among the rich than the poor (National Institute of Health and ORC Macro, 2004). The survey also showed that HIV prevalence was 6.0% higher in people who had a secondary education compared to 3.2% prevalence in those who have never been to school. This indicates that better educated and wealthy individuals in sub-Saharan Africa are at elevated risk for HIV and STDs. However, there is evidence from a 2003–2004 study in the Kwazulu Natal Province of

South Africa that an additional year of formal education reduces the contraction of the HIV virus by 7% (Bärnighausen, Hosegood, Timaeus, & Newell, 2007).

Wagner et al. (2017) noticed an increase in RSB after randomly assigning grant cash (i.e., a lottery) to men. Compared to nonwinners, there was a suggestive pattern of RSB among lottery winners because it increased their ability to afford risky sex. The issue of RSB and its consequences is concerning to public health practitioners. In the following paragraphs, I discuss whether wealth or education is influential in driving the link to RSB.

Some have argued that access to income gives people the ability to experiment with sex and engage in sex with no cohabiting partners (Kassa et al., 2016). On the other hand, there is also evidence of a significant positive relationship between poverty, low educational level, and RSB (Jewkes & Dunkle, 2012; Yanga et al., 2013). The UNAIDS (2005) reported that poverty can rise exposure to HIV. HIV is concentrated in the poorest regions of the world, with prevalence high amongst those living in slums compared to those living in urban settings (Silas, 2013). Risk factors for HIV in women are attributable to gender-based violence, gender inequalities, poverty, and low educational level (Abdool, Sibeko, & Baxter, 2010; Kelly et al., 2013; Pettifor et al., 2008). A study conducted in a poor area of Kenya reported higher rates of having multiple sexual partners among women aged 15–49 years old (Dodoo, Zulu, & Ezeh, 2007; Zulu, Dodoo, & Ezeh, 2002). Another study conducted among Nigerian youth indicated that in terms of education, female youths who had a higher level of education and were working were more likely to use condoms at last sexual activity compared to female youths with no

education (Odimegwu & Somefun, 2017). In a similar study conducted in Malawi, Maonga et al. (2018) observed that married men with secondary level education were more likely to use condoms with noncohabiting sexual partners compared to uneducated married adults. Accessibility to knowledge that increases an individual's understanding may be the reason behind this. It has also been argued that educational attainment may influence a person's perception of HIV infection (Fagbamigbe, Lawal, & Idemudia, 2017). Fagbamigbe et al. (2017) found the least risk perception among individuals with higher education compared to those with secondary and Koranic education. This finding is in accordance with those of other studies (Mgbere et al., 2013). When examining the association between school, material standard of living, and RSB in sub-Saharan Africa, Lucas and Wilson (2018) found an association between female primary school completion and the likelihood of being HIV positive ($p < 0.01$), whereas the completion of female secondary education reduced the chances of being HIV positive ($p < 0.01$). However, Lucas and Wilson also reported that educational attainment for males is associated with the increased likelihood of multiple sexual partners. This finding was supported by a systematic review conducted in 2002, in which Hargreaves and Glynn (2002) observed that in Africa, higher educational attainment was associated with a higher risk of contracting the HIV virus. However, these findings are not consistent with that of others (e.g., Madise, Zulu, & James, 2007; Mbotto et al., 2006; Mitsunga et al., 2005). In a study conducted in Zambia, Mitsunga et al. (2005) reported that education and wealth was not associated with extramarital sex and multiple sexual partners.

Several researchers have suggested that women who are socioeconomically disadvantaged exhibit risky sexual behaviors more than their counterparts (Jewkes & Dunkle, 2012; Madise et al., 2007; Miller et al., 2016; Ramjee & Daniels, 2013; Yanga et al., 2013). As the burden of caring for the entire family structure falls on women in most African countries, they are plunged into poverty, thus increasing the pressure to resort to sex in exchange of goods and services with wealthy men and also engage in multiple sexual partners (Kadiyala, 2005). According to some researchers, poverty contributes to early sexual debut, transactional sex and to multiple sexual partners for adolescent girls and young women (Kilburn et al., 2018; Nyovani, Eliya & James, 2007). This observation is consistent with that of Booysen (2002), which stated that RSB is associated to poverty only in the case of multiple sexual partners. Nyovani and colleagues (2007), in their study “Is Poverty a Driver for Risky Sexual Behavior” in four African countries found that there is a likelihood of initiating first sexual activity among poorer females compared to their well-off counterparts. Their findings also indicated that poorest adolescents and young women were less likely to use condoms compared with the wealthiest (Nyovani et al., 2007). This has expounded on the debate that economic vulnerability increases vulnerability to STDs. Amoatang and colleagues (2014), have revealed that less empowered females are particularly vulnerable to STDs, while others have found that RSB is practiced when women are not economically empowered thus are unable to negotiate safer sex (Mishra et al., 2007; Tadesse & Yakob, 2015; Uchudi et al., 2012).

These conflicting views indicate that more research needs to be done to understand the key drivers of RSB in sub-Saharan Africa. By comparing women and men in diverse geographical settings that engage in risky sexual behavior, it is possible to gain insights into key factors that lead to engagement in RSB (multiple sexual partners, transactional sex, early sexual debut and inconsistent or no condom use) in both low- and high-income individuals as well as educated and uneducated individuals.

HIV/AIDS and Risky Sexual Behavior in Zimbabwe

Zimbabwe is located in Southern Africa and has a very high HIV prevalence rate compared to other countries in the region. According to USAID reports (2018), in 2017, 1.3 million people were living with HIV in Zimbabwe with an adult (15-49) prevalence rate of 13.3% and 41,000 new infections. RSB such as unprotected heterosexual sex is the main transmission route for new infections with women and young girls who are disproportionately affected (Avert, 2018). According to USAIDS (2018) and Zimbabwe National Statistics Agency, an estimated 740,000 women were living with HIV in 2017 with 2.7% of women age 15-17 living with HIV and increasing to 13.3% in women age 23-24 compared to young men age 15-24 years at 2.9%. According to research, the key drivers of the HIV tragedy among Zimbabwe women is gender inequality (23% of women think women don't have the right to negotiate condom use with their spouses even if he has an STI), sexual violence from partners, intergenerational sex, and lack of a comprehensive HIV knowledge (Zimbabwe National Statistics Agency, 2016; Zimbabwe National Statistics agency 2015).

HIV/AIDS and Risky Sexual Behavior in Cameroon

In 2016, Cameroon's HIV incidence was 32 000 new infections (UNAIDS, 2017). With a population of about 23 million inhabitants, the HIV prevalence rate has dropped from 5.5% to 4.3% amongst adults ages 15-49, which remains amongst the highest in the west and central African region (INS, 2011; USAID, 2011). Women and young girls bear the brunt of the HIV burden than their male counterparts. According to the Cameroon Demographic health Survey (CDHS), the prevalence of HIV was reported to be twice high among women (5.6%) compared to males (2.9%). Transactional sex due to several reasons, poverty being one of them has been reported as a key driver of HIV in Cameroon. To examine the association between sociodemographic characteristics, alcohol use and transactional sex among Female Bar Workers (FBWs) in Yaoundé, Cameroon, Akoku and colleagues (2017) found that FBWs with a monthly income of less than \$89 were more likely to have engaged in transactional sex in the past 12 months. Another study conducted in South Africa found similar results (Kilburn et al., 2018). Research on HIV acquisition is even more complicated because individuals from all levels of economic status and educational level are equally affected by the disease thus their engagement in RSB (Akoku et al., 2018; Kongnyuy et al., 2005; Mumah & Jackson-Smith, 2015; Mumah & Jackson-Smith, 2014; Noubiap et al, 2015;). umah and Jackson-Smith (2014), found that women with high SES were the most likely to report having sex with somebody else other than their partner, or to have had more than one sexual partner over the previous year. Similarly, Kongnyuy and colleagues (2005) found that wealthy men were more likely to have multiple sexual partners due to the availability of

resources. Mishra and colleagues (2007), after conducting a study in eight SSA countries found that, wealthy Cameroon men engage in their first sexual intercourse one year earlier than poorer men, compared to other countries where men's first sexual intercourse has very little to do with wealth. Mumah and Jackson-Smith (2014) also found that unemployed women were the most likely to engage in early sexual debut compared to women with high SES. This is similar to other studies (Tarkang et al., 2018). Like most other countries in sub-Saharan Africa, Cameroonian women and youths are at high risk of contracting HIV through transactional sex, multiple sexual partners, no or inconsistent condom use and early sexual debut.

Risky Sexual Behavior and HIV in Rwanda

HIV is a major public health concern in Rwanda. The HIV prevalence rate in Rwanda amongst adults age 15-49 is 2.7% (UNAIDS). Like every other country under investigation in this study, women are disproportionately affected with a prevalence rate of 3.4% compared to 1.9% for men (UNAIDS, 2017). According to the DHS 2014-2015 statistics, less than 1% of women had two or more sexual partners 12 months preceding the survey and 48% of women who had 2 or more sexual partners prior to the survey used a condom during their last sex. On the other hand, 31% of men who had 2 or more sexual partners 12 months preceding the survey reported having used a condom in their last sexual encounter (DHS, 2017). In an effort to explore HIV knowledge and its effect on RSB using DHS, Rugigana, Birungi, and Nzayirambaho (2015), found that of the 2,773 men surveyed in 2005 and 3,772 men surveyed in 2010, 5% and 7% respectively indicated having two or more sexual partners. A huge proportion of these men that

reported multiple sexual partners did not use condoms, as 93% reported no condom use in 2005, and 74% reported no condom use in 2010. However, after conducting a household survey of 692 youths age 12-24, Ntangiri and colleagues (2012), found that condom use was less likely to be known among females compared to their male counterparts (48.9% vs 65.7), while 41% reported being more likely to engage in early sexual debut, even though, males were reported to start more earlier than females. The Rwandan government has continuously work towards the elimination of HIV. This will also mean targeting risky behaviors that exposes people to HIV/AIDS.

Multiple Sexual Partners as an Element of Risky Sexual Behavior

Most researchers believe that unsafe sexual behavior is the principal mechanism through which STI such as HIV is spreading in sub-Saharan Africa (Leclerc-Madlala, 2008). Some of these authors believe that multiple sexual partners are the underlying root cause of the high prevalence and incidence rate of HIV in this region (Halperin & Epstein, 2004; Leclerc-Madlala, 2009; Uchudi, Magadi, & Mostazir, 2012). Women are especially exposed to HIV than men because they are often economically disadvantaged thus limiting their ability to negotiate for safer sex. Multiple sexual partnership can also be rooted in cultures. In patriarchal communities, engaging in multiple sexual partnership is normal. There are societies or social norms that permit and promote and even systemize multiple sexual partners as an acceptable form of sexual conduct thus increasing the risk of HIV or STDs for both married and unmarried couples. Ntseane and Preece (2005) argues that sexual relationships with multiple sexual partners and extra marital relationships is common among men and women who live in liberal societies

were sexual moralities are not questioned and these societies legitimate multiple and concurrent partnerships. In such communities, women's autonomy is not suppressed, and they can make decisions on their sexual behavior. As much as culture can promote and permeate RSB, it can also prevent RSB. In a study looking at ethnic differences in sexual behavior in Cameroon, Rwenge (2004), found that cultural norms specific to ethnic groups shapes sexual behavior. Rwenge (2005), found that the Beti ethnic clan in Cameroon were more likely to exhibit risky sexual behavior compared to the Bamileke counterparts because sexual permissiveness is commonly tolerated as a reality for both males and females.

According to Uchudi and colleagues (2012), having multiple sexual partners can be influenced by autonomous decisions translated from increased levels of economic power, social change and cultural secularization. This argument purports that engaging in multiple sexual partner may be promoted by economic status. This observation is consistent with Booyesen study on "HIV/AIDS, poverty, and risky sexual behavior in South Africa" which indicated that risky sexual behavior is associated with poverty only in the case of multiple sexual partnerships. Women may want to keep multiple sexual partners due to the growing list of needs ranging from tuition, food, to sophisticated needs such as designer bags, nice dresses and shoes and cars. Other studies have argued that men with multiple sexual partners are economically viable thus can afford the life styles (Kongnyuy et al., 2005).

Unprotected Sex/Inconsistent or No Condom Use

Having unprotected sex is having sex without using any form of protection such as condoms. According to the WHO (2019), unsafe sex is ranked second among the top ten risk factors to health in terms of the burden of disease they cause. The health impacts of unprotected sex are, a possible contracting of STDs. Studies have revealed that women's power to negotiate safer sex is often hampered by inequalities of wealth, lack of economic opportunities and age disparities (Mishra et al., 2007; Uchudi et al., 2012). Several studies have reported low levels of condom use irrespective of chances of infections such as HIV/AIDS (Ahmed et al., 2001; Biraro et al., 2009).

Sexually Transmittable Disease

STDs prevail globally. The consequences of STDs include but not limited to infertility, enhanced HIV transmission, and pregnancy complications. According to the WHO, more than one million STDs are acquired on a daily basis globally. STDs have dire consequences such infertility, enhance HIV transmission, psychological effects and for some women pregnancy complications.

Literature Review Summary

Based on my literature review, and considering the conflicting results on the association of risky sexual behavior with educational and economic status, I am inspired to cross-examine using recently released DHS data by including four dependent variables of RSB (multiple sexual partners, no or inconsistent condom use, early sexual debut, and transactional sex) and five countries representing the various regions in sub-Saharan Africa. The objective of the study was to determine the consistency of RSB among

women and men with regard to their age, region, gender, educational level and economic status.

Definitions

Socioeconomic status (SES): is a measure of a combination of a person's economic and social status which is associated with health either positively or negatively (Baker, 2014).

Risky sexual behavior (RSB): It is behavior related to sexuality that exposes an individual to health-related problems such unwanted pregnancies, STIs, psychological distress, HIV, and abortion (Fentahun & Mamo, 2014; Tadesse & Yakob, 2016;)

Human Immunodeficiency Virus (HIV): HIV is a virus spread through certain body fluids that attacks the body's immune system, specifically the CD4 cells, often called T cells" (CDC, 2019).

Sexually Transmitted Infections/Disease (STIs/STDs): The WHO (2013), defines STDs as one of the five types of diseases for which adults around the world most commonly seek medical help. Wagenlehner and colleagues (2016) define it as an infection caused by different types of bacteria, viruses, and parasites that are communicated from one individual to another through vaginal, oral, anal or sexual contact.

Multiple Sexual Partners: The number of nonmarital non-cohabiting sexual partners (UNAIDS, 2017)

Transactional Sex: Transactional sexual relationships are non-marital, non-commercial sexual relationships based on an assumption that sex will be exchanged financial, material and other benefits (Lilburn et al., 2018).

Intergenerational Sex: A young person between the ages of 15-24 having sex with somebody 10 years older and above.

Unsafe Sex: It is engaging sexual activity with no condom or some form of protection.

Early Sexual debut: It is defined as having had first sexual intercourse before the age of 15 (Magnuson, Nield, & Lapane, 2015).

Assumptions

One key assumption of the study is that SES provides a framework for understanding the dynamic interplay between risky sexual behavior and individuals. Data were weighted using the weighting factors of the demographic health survey, therefore this weighted samples were assumed based on the DHS variables. Cross-sectional data were utilized; therefore, it will be difficult to infer causality. I am also assuming that responses to questions were accurate as much as possible because data have been validated by DHS.

Scope and Delimitations

Conclusions will be generalized to the region of sub-Saharan Africa. This study focused on the populations residing in Cameroon, Zimbabwe, and Rwanda who were surveyed in DHS from 2011-2015. The SCT framework I have chosen accounted for the multilevel influence of risky sexual behavior. Furthermore, the study focused on specific

elements of RSB, as suggested by other researchers (Awusabo-Asare & Annim, 2008; Berhan & Berhan, 2015; Dintwa, 2012; Madise, Zulu, & Ciera, 2019; Odimegwu et al., 2016; Tanga & Tangwe, 2014) that focused on socioeconomic status.

Study Boundaries

Although the DHS contains questions on a variety of topics, I included data on higher risk sex and consistency in higher-risk sex data grouping in relation to socioeconomic characteristics. In this study practicing unprotected sex, engaging in transactional engaging in early sexual debut, and having multiple sexual partner were expressed as indicators of RSB. The key explanatory variables are educational level and economic status.

Study Significance and Social Change Implications

This study can contribute to the debate on the association between socioeconomic status (education and economic status) and RSB among both males and females in sub-Saharan Africa. The aim was to investigate and more specify the relationship between socioeconomic status and RSB that exposes individuals to HIV/AIDS, using 2011-2015 DHS of each country under study. Several studies have investigated this relationship; however, the results are very conflicting. By comparing women and men in diverse geographical settings that engage in RSB, we will be able to gain insight to guide policies towards the prevention of HIV/AIDS and other STDs.

This study can support the mission of positive social change by providing a better understanding of RSB determinants and by contributing to HIV/AIDS prevention practice. Findings may assist policymakers, community builders, HIV/AIDS

practitioners, and other key stakeholders in determining factors of RSB in high risk population groups in developing countries.

Significance to Theory

To better understand the relationship between economic status, education, and RSB among men and women in sub-Saharan Africa the SCT by Albert Bandura was adopted. The DHS allows for multilevel analysis of cross-sectional data containing questionnaires for individuals, which possible to apply the SCT framework. Moreover, SCT emphasizes the importance of self-efficacy which has a direct impact on behavior (Bandura, 2004). Bandura (2014), posited that when an individual's self-efficacy is promoted, that individual becomes self-assured in their abilities to negotiate safe sex or engage in healthy sexual behavior. The framework addresses lack of self-efficacy as barriers to healthy sexual behavior.

Significance to practice

There are conflicting views on factors that promote RSB (Berhan & Berhan, 2015; Lucas & Wilson, 2018; Tadesse & Yakob, 2015; Odimegwu et al., 2016; Odimegwu & Mutanda, 2017). The impact of RSB is significant due to vulnerability to STDs including HIV, which is thought to be more common in low income countries. Sub-Saharan Africa has more than two thirds of all people living with HIV with women and young people bearing the burden of the disease (WHO, 2018). People who are at risk of engaging in RSB need practical solutions to improve their quality of life.

Summary

This section included a review of the literature associated with RSB, economic and educational status in sub-Saharan Africa. I discussed the prevalence of RSB and HIV in the three countries that were examined. I justified the application of the SCT as the theoretical framework for the study. Additionally, I discussed the various factors RSB that influence high HIV incidence in sub-Saharan Africa, and justification for using secondary data sources such as DHS. In the next section, I will present the methodology and design used in the study.

Section 2: Research Design and Data Collection

In the previous section, I provided a review of the current literature on RSB, with an emphasis on socio-economic determinants, including economic factors and educational level. In this study, I investigated RSB in women and men aged 15–49 years old. This section includes a discussion of the specifics of the study design, sample, and analytical techniques used to address the gap in the literature.

Research Design and Rational

The purpose of this secondary data analysis study was to examine the socio-economic determinants of RSB in the sample population. Unlike other study designs, cross-sectional study designs are used for population-based surveys just like the DHS (Setia, 2016). In this study, I looked at the factors affecting RSB in three different countries in sub-Saharan Africa. Since there was no intervention, experimental and quasi-experimental designs were not suitable for this study. Because the data had been already collected for country specific purposes, there was no time restriction regarding the design and data collection.

Data Collection

USAID (DATE) has been collecting household-based data for over 20 years in developing countries. The DHS surveys are nationally represented, have large sample sizes, and are mostly characterized by cross-sectional study designs. The intention of the survey is to address household health issues. The study respondents are selected based on strata for urban and rural households. Most of the surveys use same definitions and questionnaires that have been developed by MEASURE DHS (DHS, n.d.). Higher risk

sex, HIV knowledge, and SES are some of the focus areas of all DHS, with the same methods of data collection and same data representation across all countries.

In this study, I used three nationally representative, cross-sectional sets of data from the most recent DHS conducted between January 1st, 2011 and December 31st, 2015. The weighted sample of both men and women from the latest survey was obtained for three countries from MEASURE DHS for the analysis in this study: the 2011 Cameroon DHS, the 2014–2015 Rwanda DHS, and 2015 Zimbabwe DHS. Each of the surveys collected nationally representative data of RSB for women in the reproductive age group of 15–49 years old and men 15–54/59 years old. A summary of the analysis sample was disaggregated by age, gender, country of origin, religion, and location (i.e., urban and rural).

Sampling and Sampling Procedure

There are two types of DHS surveys: standard DHS surveys and interim DHS surveys. The DHS surveillance data include more than 50 countries that are surveyed nationally. Data collection was not consistent because the latest data available for Cameroon, Zimbabwe, and Rwanda were 2011, 2015, and 2014–2015, respectively. In the DHS national codebook for the data set, there was a sample of approximately 14,214 households surveyed in Cameroon in 2011, 10,534 surveyed in Zimbabwe in 2015, and 12,699 households surveyed in Rwanda in 2014–2015 (DHS National Statistics, 2011–2016). The DHS survey has three types of questions: a household questionnaire, a women's questionnaire, and a men's questionnaire. These samples are representative at the national, residential (i.e., urban-rural), and at the regional levels. The surveys are

often based on a stratified two-stage cluster design: enumerations areas drawn from census files, and in each enumeration area selected, a sample household is drawn (Measure BHS, 2008). The selected DHS subset consisted of people who reside in all three countries under investigation.

Sample Frame

The sampling frame included (a) adults surveyed in DHS; (b) individuals aged 15–49 years old; (c) urban and rural residents of Cameroon, Zimbabwe, and Rwanda; (d) survey years 2011–2015; and (e) all reported genders. The sample excluded those who were younger and older because the DHS survey did not ask these questions to individuals below 15 years old and those older than 49 years old for women or older than 59 years old for men. The sample population included those that were sexually active.

Inclusion Criteria

The data sources used for this analysis were DHS done between 2011 and 2015. The criteria for the DHS survey to be included in this analysis was the availability of data on individuals' higher-risk sex and consistency in higher-risk sex data grouping in relation to socio-economic characteristics. The age range for participants involved in all surveyed countries was 15–49 years old.

Research Questions and Variables

RQ1: Is there an association between SES and RSB among men and women in sub-Saharan Africa?

H_0 1: There is no significant association between SES and RSB in sub-Saharan Africa.

H_{a1} : There is a significant association between SES and RSB in sub-Saharan Africa.

The independent variable was SES (i.e., wealth index and educational level); the dependent variable was RSB; and the control variables were gender, age, country, and location (i.e., rural versus urban).

RQ2: Is there an association between country of origin and RSB among men and women in sub-Saharan Africa?

H_{02} : There is no significant association between country and RSB.

H_{a2} : There is a significant association between country and RSB.

The independent variable was country of origin; the dependent variable was RSB; and the control variables were gender, SES (i.e., wealth index and educational level), age, and location (i.e., urban versus rural).

RQ3: Is there an association between religion and RSB in sub-Saharan Africa?

H_{03} : Religion has no significant association with RSB in sub-Saharan Africa.

H_{a3} : Religion has a significant association with RSB in sub-Saharan Africa.

The independent variable was religion, the dependent variable was RSB; and the control variables were SES (i.e., wealth index and educational level), age, country, and location (i.e., urban versus rural).

Instrumentation and Operationalization of Constructs

Specification and measurement of the dependent variable. In this study, having multiple sexual partners, condom use, early sexual debut, and transactional sex were expressed as indicators of RSB. The indicators were defined in the following ways: having multiple sexual partners was expressed as having more than one sexual partner in the 12 months preceding the survey, a condom was used at last sexual intercourse, early sexual debut or age at first sexual intercourse (where sexual debut before the age of 16 years old was regarded as risky), and having transactional sex. Multiple sexual partners were coded “1” if a man or woman reported involvement with multiple sexual partners in the past 12 months prior to the survey and “0” otherwise. For condom use at last sexual encounter, participants were coded “1” if they reported use of condom at last sexual intercourse and “0” otherwise. For early sexual debut, respondents were coded “1” for having sex before the age of 15 years old and “0” otherwise. Transactional sex was coded as “1” if the respondent reported yes to transactional sex in the past 12 months and reported that no condom was used, and 0 if they reported not having transactional sex in the past 12 months. I calculated a composite RSB score (i.e., the ordinal variable) by adding the codes for each indicator above per participant; this score was used as the dependent variable to facilitate statistical analysis. This score had a lower limit of 0 and a high of 4.

Specification and measurement of independent and control variables. The key explanatory variables were educational level and economic empowerment. Both

variables were represented by selected direct measures of individual-level questions on the highest education level achieved and wealth status as used in the DHS survey.

In the DHS, the respondents were asked about their highest level of education (i.e., ordinal variable). From this response, I constructed three educational levels: no education, primary school completion, and secondary school/higher completion. The wealth index in the DHS survey was a composite measure of household cumulative living standard. The wealth index was calculated using easy-to-collect data on a household's ownership of selected assets, such as televisions and bicycles, materials used for housing construction, and types of water access and sanitation facilities. In all DHS, the wealth index (i.e., ordinal variable) was found consistently grouped as poorest, poor, medium, rich, and richest. To fit in this analysis, I dichotomized the wealth index as low or lowest and middle to highest.

The respondents' ages were categorized into four groups: (a) 15–19 years old, (b) 20–24 years old, (c) 25–34 years old, and (d) 35–49 years old. Country of residence was coded as (a) Cameroon, (b) Zimbabwe, and (c) Rwanda and subcoded as (e) rural, or (f) urban. Gender was coded as (a) male or (b) female. Gender, age, and place of residence were all nominal variables.

Data Analysis

I conducted statistical analysis in three phases. First, descriptive statistics (i.e., frequencies) were calculated for all variables. Then, I conducted a bivariate analysis to test the relationship between each independent and dependent variables. Since all variables were categorical (i.e., nominal or ordinal), the chi-square test was the

appropriate bivariate test to use. Finally, multivariable analysis was conducted for all research questions, having an outcome variable of the RSB score. To facilitate the analysis, I recoded the RSB score into a binary variable (i.e., high RSB = scores of 3 and 4; low RSB = scores of 0–2). Binomial logistic regression was the most appropriate type of multivariable analysis. I used a significance level of 0.05 and performed all statistical analyses with SPSS, Version 24.

Threats to Validity

The goal of this subsection on validity was to address potential limitations of using DHS data for this investigation. The DHS has a comprehensive data set that encompasses different topics and research agenda. The DHS data set has the following limitations: omission of relevant variables, which is the most common limitation in econometric analysis is prevalent; populations of interest, such as street children and nomads, are not covered, generating incomplete data in household health surveys; nutrition patterns, malaria, tuberculosis, and AIDS are risk factors and illnesses for which no complete set of questions is available and require objective tests to be confirmed; determining of economic status is limited to a short list of durable goods; and specific questions are not always answered (Martin Del Burgo & Amaral, 2015).

External Validity

External validity describes the degree to which studies outcomes can be generalized to include other individuals, communities, and times. DHS contains data on individuals aged 15–49 years old, which may allow for longitudinal follow-up. The survey has differential wealth statuses, which are computed through comparisons of

households within their distinct countries (Odimegwu et al., 2016); therefore, it is important to note that cross-national interpretation of poor households in Cameroon may not be poor in Rwanda. Because the analysis was limited to women and men aged 15–49 years old, the findings may not be generalizable to individuals younger than 15 years old from whom abstinence is expected.

Internal Validity

Internal validity concerns threats or factors that are not the independent variable and may affect the dependable variable. In this study, I confirmed internal validity as much as possible by using the appropriate statistical analysis.

Ethical Consideration

The DHS survey has already been approved by the ICF Macro in Calverton Maryland Institutional Review Board. It has also been approved by the ethics committees of the ministries of health in the various countries from which data were being collected. Informed consent is collected from all participants by the DHS. Data from the DHS are publicly available for use. Finally, I obtained Walden Institutional Review Board approval (Approval No. 08-27-19-0538276) prior to conducting any analysis for and/or reporting the results of this doctoral study

Summary

In Section 2, I discussed the applied research methodology for secondary data, originally collected for the DHS in Cameroon, Rwanda, and Zimbabwe, used in this study. Furthermore, I described the population under investigation, the sample, the research design, data collection procedure, data analysis, and reasons for the data analysis

techniques employed. Ethical concerns were also provided. In the next section, I will present the results of the analysis relative to the research questions and hypotheses.

Section 3: Presentation of the Results and Findings

Presentation of Results and Findings

The purpose of this quantitative study was to utilize cross-sectional data to examine determinants of RSB in three sub-Saharan African countries (i.e., Zimbabwe, Cameroon, and Rwanda). Section 3 includes results of statistical analyses (i.e., descriptive statistics, chi-square, and multivariable analysis) on data collected in all three countries of the DHS survey. I provide a brief description of the time frame and missing data in the Zimbabwe, Cameroon, and Rwanda versions of the DHS data set, descriptive demographics of the sample, representativeness of the sample, and univariate characteristics and inferential analysis of the sample. I conclude with a summary of the results for the three research questions.

Data Collection of Secondary Data Set

The DHS is a nationally representative household survey that provides data for a wide range of monitoring and impact evaluation indicators in the areas of population, health, and nutrition. The DHS program has collected, analyzed, and disseminated accurate and representative data on population, health, HIV, and nutrition in over nine countries. I used the latest published data for each country, from 2011, 2014–2015, and 2015 for Cameroon, Rwanda, and Zimbabwe, respectively, including questions on wealth, educational level, country of origin, gender, age, area of residence, and sexual risk behaviors (i.e., RSB).

Time Frame and Response Rate

DHS data collection is done on an annual basis for all countries involved. I used data from 2011, 2014–2015, and 2015 for Cameroon, Zimbabwe, and Rwanda, respectively. The total sample for Cameroon was 19,426, for Zimbabwe 9,955, and for Rwanda 13,671, making a total combined sample size of 39,052 participants.

Discrepancies in the Data Set

The original data analysis plan included transactional sex and early sexual debut as factors of RSB; however, there were some discrepancies involved, including missing data for transactional sex and early sexual debut. I replaced these factors with having a STI during the last 12 months. Therefore, the three RSB used in this study were condom use, having multiple partners, and having a STI during the last 12 months.

Descriptive Demographics of the Sample

Representativeness of the Sample

The detailed procedures of the data collection were previously presented in Section 2.

Univariate Characteristics of the Samples

Table 1 shows results of the descriptive analysis. Variables included age, RSB, country, religion, type of residence, sex, educational level, and wealth index. As seen on Table 1, 39,052 participants were surveyed and 28,498 sampled for RSB while data for 10,554 were missing.

Table 1

Univariate Characteristics of RSB in Zimbabwe, Cameroon, and Rwanda

Characteristics		<i>N</i>	%
	Categories	39,052	100
Country	Zimbabwe	9,955	25.5
	Cameroon	15,426	39.5
	Rwanda	13,671	35
Place of residence	Urban	14,660	37.5
	Rural	24,392	62.5
Highest level of education	No education	4,963	12.7
	Primary	1,7142	43.9
	Secondary	1,5153	38.8
	Higher	1,794	4.6
Sex	Male	25,979	66.5
	Female	13,073	33.5
Wealth index	Poorest	6,752	17.3
	Poorer	7,583	19.4
	Middle	7,775	19.9
	Richer	8,036	20.6
	Richest	8,906	22.8
RSB	Low RSB	27,670	70.9
	High RSB	828	2.1
Religion	Traditional	11,649	29.8
	Christian	26,170	67

	Muslim	371	1
	Other	862	2.2
Age	15–19 years	8,709	22.3
	20–24 years	7,592	19.4
	25–34 years	12,133	31.1
	35–49 years	10,618	27.2

Bivariate Analysis (Chi-Square)

As shown in Table 2, 97.2% of Zimbabweans had low RSB compared to 2.8% with high RSB. In Cameroon, 95.1% had low RSB, while 4.9% had high RSB. In Rwanda, 97.9% had low RSB and 2.1% had high RSB. There is a significant association between country and RSB; Cameroon had higher RSB rates compared to the other two countries. When interpreting effect size (i.e., Cramer's V), a value of zero indicates no relationship, a value between .2 and .3 will be a moderate relationship, and above .3 will be a strong relationship. In this study, the Cramer's V coefficient value was .065, indicating a very weak effect.

Table 2 indicates that 97.7% of urban dwellers had low RSB compared to 2.3% with high RSB. In rural areas, 96.1% had low RSB, while 3.2% had high RSB. Those in rural areas significantly engage in more RSB compared to those in urban areas. The chi-square analysis yielded $p = .000 < 0.05$, which shows that place of residence had a significant effect on RSB. The effect size was very small because Cramer's V coefficient was 0.025.

Ninety-five percent of the participants with no education had low RSB, while 4.6% had high RSB. For those with primary education, 96.6% had low RSB, while 3.1% had high RSB. For those with secondary level education, 97.5% had low RSB, compared to 2.5% participants with high RSB, and those with higher education reported 99% for low RSB and 1% for high RSB. The report from the chi-square analysis yielded $p = 0.000 < 0.05$, which shows that educational level had a significant effect on RSB; those with higher education exhibited lower RSB rates compared to all other education groups. Therefore, there is a significant association educational level and RSB, and the Cramer's V result shows a very small effect of .042.

From the cross-tabulation analysis, 97.1% of male participants had low RSB, while 2.9% had high RSB. These numbers are the same for females. The chi-square analysis yielded $p = .977 > 0.05$, indicating that sex had no significant effect on RSB.

As seen in Table 2, 96.3% of participants considered to be the poorest had low RSB, while 3.7% had high RSB. For participants classified as poorer, 96.5% had low RSB, while 3.5% had high RSB. For middle, 96.9% had low RSB, while 3.1% had high RSB. For richer participants, 97.3% had low RSB, while 2.7% had high RSB, and those 98.1% of participants considered richest had low RSB and 1.9% had high RSB. Looking at the cross tabulation, there is significant difference in high RSB between the poorest (3.7%) and richest (1.9%). The chi-square analysis yielded $p = 0.000 < 0.05$; hence, there was a significant association between wealth index for urban/rural residence and RSB. The proportion of high RSB among the poorest participants was higher than the

proportion of RSB for participants among the poorer, middle, richer, and richest categories. The Cramer's V result showed a very small effect of .039.

Analyzing religion, 97.4% of traditionalists had low RSB, while 2.6% had high RSB. Ninety seven percent of Christians had low RSB, while 3% had high RSB. As for Muslims, 94.7% had low RSB, while 5.3% had high RSB. Among those of other faiths, 97.2% had low RSB, while 2.8% had high RSB. According to chi-square results, $p = .126 > 0.05$, indicating that religion had no significant effect on RSB.

As shown in Table 2, 95.4% of participants aged 15–19 years old had low RSB, while 4.6% had high RSB. Ninety seven percent of participants aged 20–24 years old had low RSB, while 2.9% had high RSB. As for participants in the age group of 25–34 years old, 97.7% had low RSB, while 2.3% had high RSB. In the age group of 35–49 years old, 97.8% had low RSB, while 2.2% had high RSB. From the chi-square test, $p = 0.00 < 0.05$, showing that age had a significant effect on RSB. Worthy to note is the fact that participants in the age group of 15–19 years old had a higher RSB level compared to participants from other age groups. The Cramer's V result showed a very small effect of .055.

Table 2

Bivariate Analysis (Chi-square) Between RSB and Socioeconomic Status, Country, Religion, Age, and Gender

Independent Variables	RSB		Total	X ²	Chi-square test	
	Low RSB (%)	High RSB (%)			P	Cramer's V
Country				119.101	.000	.065
Zimbabwe	97.2%	2.8%	100			
Cameroon	95.1%	4.9%	100			
Rwanda	97.9%	2.1%	100			

Type of Place of Residence				18.400	.000	.025
Urban	97.7%	2.3%	100			
Rural	96.8%	3.2%	100			
Highest Level of Education				50.979	.000	.042
No Education	95.4%	4.6%	100			
Primary	96.9%	3.1%	100			
Secondary	97.5%	2.5%	100			
Higher	99%	1%	100			
Sex				.001	NS	-
Male	97.1%	2.9%	100			
Female	97.1%	2.9%	100			
Wealth Index for Urban/rural				43.793	.000	.039
Poorest	96.3%	3.7%	100			
Poorer	96.5%	3.5%	100			
Middle	96.9%	3.1%	100			
Richer	97.3%	2.7%	100			
Richest	98.1	1.9%	100			
Religion				5.727	NS	-
Traditional	97.4%	2.6%	100			
Christian	97%	3%	100			
Muslim	94.7%	5.3%	100			
Others	97.2%	2.8%	100			
Age				85.820	.000	.055
15-19	95.4%	4.6%	100			
20-24	97.1%	2.9%	100			
25-34	97.7%	2.3%	100			
35-49	97.8%	2.2%	100			

Multivariable Analysis

To have as valid a result as possible, I conducted two regression models to predict high RSB: one using all available independent variables (i.e., country, type of residence, educational level, sex, wealth index, religion, and age) as predictors and another using only the variables found significant in the bivariate analysis (i.e., country, type of residence, educational level, wealth index, and age) as predictors.

Regression Model I. The Hosmer Lemeshow test results was $p = 0.00$, which showed that the model was not a good fit. In addition, the Nagelkerke R^2 test was 0.036, indicating that the independent variables explain 3.6% of the variance in the dependent variable.

The regression analysis findings in Table 3 show that country had $p = 0.000 < 0.05$, educational level had $p = 0.000$, wealth index had $p = 0.011$, and age had $p = 0.000$; therefore, the null hypothesis was rejected for each variable. These findings show that country, education level, age, and wealth index had a significant effect on RSB. On the other hand, the result for type of residence was $p = 0.069$, sex was $p = 0.881$, and religion was $p = 0.251$ therefore, the null hypothesis failed to be rejected for each variable. This implies that type of residence, sex, and religion did not have a significant effect on RSB.

The odds of people engaging in RSB was greater for Cameroon ($OR = 1.572$, $95\%CI = 1.292-1.913$) compared to Zimbabwe. The odds of engaging in RSB was lower for (a) Rwanda ($OR = 0.457$, $95\% CI = 0.369-0.567$) compared to Zimbabwe; (b) those poorer, middle, richer, and richest ($OR = 0.896$, $95\% CI = 0.723-1.111$; $OR = 0.859$, $95\% CI = 0.689-1.072$; $OR = 0.849$, $95\% CI = 0.674-1.068$; $OR = 0.707$, $95\% CI = 0.549-$

0.911, respectively) compared to those poorest; (c) those with primary education, secondary education, or higher education ($OR = 0.611$, 95% CI = 0.488-0.764; $OR = 0.343$, 95% CI = 0.262-0.449; $OR = 0.214$, 95% CI = 0.118-0.387, respectively) compared to those with no education; and (d) those in the age groups of 20–24, 25–34, and 35–49 years old ($OR = 0.607$, 95% CI = 0.497-0.741; $OR = 0.440$, 95% CI = 0.365-0.532; $OR = 0.381$, 95% CI = 0.311-0.467, respectively) compared to those in the age group of 15–19 years old.

Table 3

*Multinomial Regression Analysis (Model I) to Predict RSB Having as Predictors
Country, Place of Residence, Education, Sex, Wealth Index, Religion, and Age*

	<i>B</i>	S.E.	Wald	<i>df</i>	<i>p</i>	<i>OR</i>	95% CI for OR	
							Lower	Upper
Country								
Zimbabwe (ref)			171.911	2	.000			
Cameroon	.452	.100	20.408	1	.000	1.572	1.292	1.913
Rwanda	-.782	.109	51.288	1	.000	.457	.369	.567
Type of place of residence								
Urban (ref)								
Rural	.322	.090	12.655	1	.000	1.380	1.155	1.647
Highest level of education								
No education (ref)			71.811	3	.000			
Primary	-.493	.114	18.585	1	.000	.611	.488	.764
Secondary	-1.070	.137	60.933	1	.000	.343	.262	.449
Higher	-1.543	.303	25.970	1	.000	.214	.118	.387
Sex								
Male (ref)								
Female	.057	.076	.576	1	.448	1.059	.913	1.229
Wealth index for urban/rural								
Poorest (ref)			7.269	4	.122			
Poorer	-.109	.110	.996	1	.318	.896	.723	1.111
Middle	-.152	.113	1.814	1	.178	.859	.689	1.072
Richer	-.164	.117	1.956	1	.162	.849	.674	1.068
Richest	-.346	.129	7.173	1	.007	.707	.549	.911
Religion								
Traditional (ref)			.976	3	.807			
Christian	.078	.090	.756	1	.385	1.081	.907	1.290
Muslim	.002	.377	.000	1	.995	1.002	.478	2.099
Other	-.038	.252	.023	1	.880	.963	.587	1.579
Age								
15-19 (ref)			111.382	3	.000			
20-24	-.499	.102	24.070	1	.000	.607	.497	.741
25-34	-.820	.096	73.034	1	.000	.440	.365	.532
35-49	-.964	.103	86.927	1	.000	.381	.311	.467
Constant	-2.206	.208	112.986	1	.000	.110		

Regression Model II. The Hosmer Lemeshow test had $p=0.001$ which shows that the model was not a good fit. In addition, the Nagelkerke R^2 for test was 0.036 which shows that the independent variables explain 3.6% of the variance in the dependent variable. The regression analysis findings in table 4 show that country had $p=0.000$, age had $p=0.000$, wealth index had $p=0.011$, type of place of residence had $p=0.000$, education had $p=0.000$, hence the respective null hypothesis was rejected. This shows that as in multivariable analysis, country, place of residence, education, age and wealth index had a significant effect on RSB.

The odds of people engaging in high RSB was greater for (a) Cameroon ($OR=1.518$, $95\%CI=1.267-1.913$) compared to Zimbabwe; (b) rural ($OR=1.373$, $95\%CI=1.150-1.639$) compared to urban. The odds of engaging in RSB was lower for (a) Rwanda ($OR=0.444$, $95\%CI=0.364-0.540$) compared to Zimbabwe; (b) Only Richest ($OR=0.702$, $95\%CI=0.545-0.904$) was found significant; (c) Primary education, Secondary education, Higher education ($OR=0.605$, $95\%CI=0.484-0.756$; $OR=0.341$, $95\%CI=0.262-0.445$; $OR=0.214$, $95\%CI=0.119-0.387$) respectively compared to no education; (e) 20-24, 25-34, 35-49 ($OR=0.605$, $95\%CI=0.495-0.738$; $OR=0.437$, $95\%CI=0.362-0.527$; $OR=0.380$, $95\%CI=0.310-0.465$) respectively compared to age group 15-19.

Table 4
*Multinomial Regression Analysis (Model II) to Predict RSB Having as Predictors
 Country, Place of Residence, Education, Wealth Index and Age*

	<i>B</i>	S.E.	Wald	<i>df</i>	<i>p</i>	<i>OR</i>	95% CI for OR	
							Lower	Upper
Country								
Zimbabwe (ref)			176.29	2	.000			
			3					
Cameroon	.417	.092	20.445	1	.000	1.518	1.267	1.818
Rwanda	-.813	.100	65.442	1	.000	.444	.364	.540
Type of Place of Residence								
Urban Ref)								
Rural	.317	.090	12.313	1	.000	1.373	1.150	1.639
Highest level of Education								
No Education (ref)			73.779	3	.000			
Primary	-.502	.114	19.555	1	.000	.605	.484	.756
Secondary	-1.076	.135	63.148	1	.000	.341	.262	.445
Higher	-1.540	.302	26.061	1	.000	.214	.119	.387
Wealth Index								
Poorest (ref)			7.674	4	.104			
Poorer	-.109	.110	.997	1	.318	.896	.723	1.111
Middle	-.152	.112	1.833	1	.176	.859	.689	1.071
Richer	-.169	.117	2.082	1	.149	.844	.671	1.062
Richest	-.354	.129	7.553	1	.006	.702	.545	.904
Age								
15-19(ref)			113.01	3	.000			
			1					
20-24	-.503	.102	24.474	1	.000	.605	.495	.738
25-34	-.827	.096	74.889	1	.000	.437	.362	.527
35-49	-.968	.103	87.787	1	.000	.380	.310	.465
Constant	-2.094	.174	144.06	1	.000	.123		
			0					

Decisions on Research Questions

RQ1: Is there an association between socioeconomic status (SES) and RSB among men and women in sub-Saharan Africa?

H0: There is no significant association between SES and RSB in sub-Saharan Africa.

Ha: There is a significant association between SES and RSB in sub-Saharan Africa.

According to both regression models (Tables 3 & 4), SES, as measured with educational level and wealth index, is significantly associated with RSB, thus the null hypothesis is rejected for RQ1.

RQ2: Is there an association between country of origin and RSB among men and women in sub-Saharan Africa?

H0: There is no significant association between country and RSB.

Ha: There is a significant association between country and RSB.

According to both regression models (Tables 3 & 4), there are significant differences between countries in RSB, thus the null hypothesis is rejected for RQ2.

RQ3: Is there an association between religion and RSB in sub-Saharan Africa?

H0: religion has no significant association with RSB in sub-Saharan Africa.

Ha: religion has a significant association with RSB in sub-Saharan Africa.

According to regression model I (Table 3), religion is not significantly associated with RSB, thus the null hypothesis is retained for RQ3.

Summary

Section 3 presents the results of my doctoral study. In this section, the study purpose, data collection structure, results of the descriptive and multivariable analysis of the RQs and key findings were included. This doctoral study examined data collected from the demographic health surveys analyzing the determinants of RSB in Cameroon, Rwanda, and Zimbabwe.

According to both bivariate and regression analyses, country, wealth index, education, age, and place of residence were found significantly affecting RSB rates in the population under study.

A detailed interpretation of the findings presented in the current doctoral study are described in Section 4. The next section is an overview of interpretations, limitations, recommendations, and conclusions that are relevant to this doctoral study. A comparison of findings to RSB and to the relevant literature is also provided in the next section.

Section 4: Application to Professional Practice and Implications for Social Change

Introduction and Key Findings

The purpose of my quantitative cross-sectional study was to examine the socio-economic determinants of RSB in sub-Saharan Africa. Findings from the multivariable analysis indicated a significant association between country, wealth, education, and place of residence (i.e., the socio-economic determinants applied in this study) and age and RSB. More specifically, the number of people engaging in RSB was greater for Cameroon ($OR = 1.572$, 95% CI = 1.292-1.913) compared to Zimbabwe. The odds of engaging in RSB was lower for (a) Rwanda ($OR = 0.457$, 95% CI = 0.369-0.567) compared to Zimbabwe; (b) those in the poorer, middle, richer, and richest categories ($OR = 0.896$, 95% CI = 0.723-1.111; $OR = 0.859$, 95% CI = 0.689-1.072; $OR = 0.849$, 95% CI = 0.674-1.068; $OR = 0.707$, 95% CI = 0.549-0.911, respectively) compared to those in the poorest category; (c) those with primary education, secondary education, and higher education ($OR = 0.611$, 95% CI = 0.488-0.764; $OR = 0.343$, 95% CI = 0.262-0.449; $OR = 0.214$, 95% CI = 0.118-0.387, respectively) compared to those with no education; and (d) the in the 20–24, 25–34, and 35–49 years old age groups ($OR = 0.607$, 95% CI = 0.497-0.741; $OR = 0.440$, 95% CI = 0.365-0.532; $OR = 0.381$, 95% CI = 0.311-0.467, respectively) compared to those in the 15–19 year old age group. On other hand, the findings from the multivariable analysis indicated no significant association between RSB, sex, and religion.

Section 4 includes an interpretation of the findings, limitations of the study, recommendations for further study, and implications for professional practice and positive social change.

Findings to Literature

In the following subsections, I present the findings broken down by variables including country, wealth index, education, sex, religion, type of place of residence, and age.

Country

From the logistic regression results, the odds of engaging in RSB was greater for Cameroon ($OR = 1.572$, 95% CI = 1.292-1.913) compared to Zimbabwe, while odds of engaging in RSB was lower for Rwanda ($OR = 0.457$, 95% CI = 0.369-0.567) compared to Zimbabwe. This result is in accordance with the fact that HIV prevalence rate in Cameroon is 3.6% amongst adults aged 15–49 years old, which remains amongst the highest in the west and central African region (CDC, 2019). In fact, Cameroon has the second largest HIV epidemic in the region after Nigeria. According to the Cameroon National Institute of Statistics (2011), 2.9% of the estimated HIV/AIDS prevalence is among youths aged 15–24 years old. In addition to young people, Lendzele (2018) reported that sex workers, truck drivers, and mobile or military personnel in Cameroon are highly affected by HIV due to RSB. High urbanization in Cameroon has also been associated with high HIV rates because people engage in high risk behaviors (e.g., prostitution) for survival (Nyambi et al., 2002).

Sex

According to the logistic modeling for sex (Model I), females tended to have higher odds ($OR = 1.059$, 95% CI = 0.913-1.229) of having high RSB compared to men. This is in contrast with Odimegwu and Somefun (2017) who found that 81% of males had multiple sexual partners compared to 35% of females; however, the authors also found that 84% of females did not use condom at last sexual intercourse compared to 57% men, possibly explaining the higher rates of RSB in females found in this study. Women bear the brunt of the HIV infection in sub-Saharan Africa (UNAIDS, 2013). Biological, social, behavioral, cultural, economic, and systematic factors contribute to this disproportionality.

Poverty is a driving force of the high prevalence and incidence rate of HIV in women (United Nations, 2012). Poverty among women in low income countries has been associated with early sexual debut, inconsistent or no condom use, transactional sex, intergenerational sex, or physically forced sex (Mabala, 2006). However, this does not mean that men do not engage in high risk sexual behavior. Romero-Estudillo et al. (2014) looked at gender differences in the high RSB of young people in Spain and found that the number of men who declared that they had had sex with casual partners was higher than their female counterparts. This is consistent with other studies indicating the tendency of men to engage in high RSB (Amado et al., 2007; Berhan & Berhan, 2015; Dunkle & Decker, 2013; Folayan et al., 2015; Teva, Bermudez, & Buela-Casal, 2011).

Age

According to the results of this study, compared to 15 to 19-year old age group, there is a decreasing level of RSB in older age groups. The odds of being involved in RSB decreases as age increases in all the four age groups. This finding is consistent with Odimegwu et al. (2016), who found that after adjusting for other factors, respondents in the 20 to 34-year old age group were unlikely to be engaged in RSB compared to those in the 15 to 19-year old age group. In the current study, those in the younger age group are more likely to engage in RSB compared to older adults.

Despite the decrease in HIV prevalence rate globally, more than 50% of incident rates occur among young adolescents in sub-Saharan Africa. According to Kangmennaang, Mkandawire, and Luginaah (2019), inconsistent condom use is high among youths in SSA. They found that only 8.5% of male youths and 7% female youths and 8% male youths and 4% female youths use condoms consistently in Ghana and CAR, respectively. After conducting a study analyzing RSB among male youths in developing countries, Berhan and Berhan (2015) found that the odds ratios for all countries involved revealed a significant association of higher-risk sex with adolescents in the age group of 15–19-years old relative to 20–24-years old group. Factors such as alcohol and drug use, early sexual debut, inconsistent condom use, and intergenerational sex are some of the reasons for high RSB among young adolescents or youths (Berhan & Berhan, 2015; Dupas et al., 2017). According to UNAIDS (2019), adolescents and young people represent a growing number of people living with HIV. In 2018, the HIV incidence rate

among young people between the ages of 10-24 years old was 510,000 globally, and 190,000 were adolescents between the ages 10 and 19 years old (UNAIDS, 2019).

Wealth Index

The definition of wealth index data included in the DHS survey is not standard; the DHS calculates wealth index using coefficients and things such as assets or services that may be specific to particular areas (Rutstein & Staveteig, 2014). This wealth index can be resident specific base in urban or rural areas, which can itemized as assets, ownership and size of land holdings and farm animals, and lower-end and upper-end possessions and amenities, such as tables, chairs, shelves, windows, windows with glass, any kind of bank account, and computers and internet connections (Rutstein & Staveteig, 2014). Therefore, the definition of wealth index in this study is not universal but cultural, based on DHS criteria. However, these criteria may not fully reflect the real socioeconomic conditions in these countries, therefore there is need to have a consensus on what criteria should be used to record the socioeconomic status in each country as accurately as possible.

Study results revealed that poorest people had greater odds of engaging in RSB compared to the richest. This is in contrast with the findings of Kongnyuy et al. (2006) who reported that men in the richest third of the population were less likely to have used a condom in the last sex with a nonspousal partner and more likely to have had more than one concurrent partner in the last 12 months and more than five life partners. In addition, Mishra et al. (2007) found that wealthier men are more likely to report more than one sexual partner and sex with a nonregular partner in the last 12 months than poorer men.

On the other hand, Odimegwu et al. (2016) also found that the higher the poverty levels amongst women in four sub-Saharan African countries, the lower the odds of exposure to RSB. This is contrary to the results of Kim and Watts (2005), who found that, due to dependency on their male partners and lack of decision-making in their relationships, women lack the power to negotiate safer sex, which often leads to high risk sex. Therefore, further research is suggested to investigate the impact of wealth levels on RSB in sub-Saharan countries.

Educational Level

In this study, I found that people with no education had greater odds of engaging in RSB compared to people with higher education. The extant research findings on education as a determinant of RSB are very conflicting. While some researchers have reported that lack of education influences RSB, others have reported that education has no effect on RSB. For example, after researching 20 countries, Uchudi et al. (2012) reported that having a primary or secondary education is associated with a higher risk of multiple sexual partnerships compared to those with a higher education. However, in the same study, they found that among unmarried women, those with primary education engage in high risk sexual partners, while married women with secondary or higher education have the highest risk of multiple sexual partners. In the case of men, they reported that there is little difference in risk of multiple sexual partnership by educational level. Lucas and Wilson (2018), after examining 32 sub-Saharan African countries, found that schooling is associated with reduced RSB in both men and women. They also found that the completion of secondary school for both males and females was associated with

reduced likelihood of being HIV positive compared to primary school completion for both males and female, which was associated with an increased likelihood of being HIV positive. These findings suggest that generalizing the current study results across sub-Saharan Africa may pose a problem because individual countries may have factors influencing these differences. However, I suggest more research be conducted to better explore the impact of education on RSB in sub-Saharan Africa.

Religion

Compared to other religions, Muslims were more at risk of engaging in RSB. Conversely, according to Finke and Adamczyk (2008), Muslims are more conservative in their sexual behavior compared to Christians. In another study, men of Muslim or traditional religious affiliation are more likely to report multiple sexual partners than their Christian counterparts (Uchudi et al., 2012).

In this study, I found no significant association between religion and RSB, although other researchers have found a significant relationship. I was surprised that despite the proliferation of religion globally, the age at first intercourse for males had declined from 18.2 years in the mid-1960s to 15.1 in the late 1990s (Wells and Twenge, 2005). In the same meta-analysis of 530 studies from 1943 to 1999, age at first intercourse for females declined from 18.5 years to 15.2 years. In most societies, religion is expected to influence an individual's sexual life because of the values that it imparts, which appeared not to be the case in this study. For example, most religions, especially Christianity, hold the view that sexual intercourse is reserved just for married men and women, and a failure to uphold this value is labelled as sacrilege. This is corroborated by

Simons et al. (2009), who reported that religion largely influences sexual behavior through its impact on sexual attitudes. Furthermore, the authors found that religious adolescents believed that sex should be carried out only after being engaged or married unlike their nonreligious counterparts. This positive attitude towards RSB found in the current study can be explained by the fact that some religions will disseminate moral norms to guide adolescents as well as employ punitive measures for bad behavior. While some religions may convey the message of no sex before marriage, others will propagate the use of condoms as the only contraceptive method, and these varying beliefs may have varying influence on behavior (Eggebeen & Dew, 2009; Lucea et al., 2013). Exploring these differences, Agha et al. (2006) found that affiliation with churches like Seventh Day Adventists, Jehovah's Witnesses, and the New Apostolic Church propagated delayed early sexual debut; however, no condom use at first sex, which may have debilitating effects on an adolescent sexual health like contracting HIV.

Contributing to the literature on the relationship between religiosity and abstinence among Nigerian youths, Somefun (2019) found that youths who were highly religious were more likely to abstain because of the messages they received at their places of worship. The author also found that there is no difference in the sexual behavior of Muslims and Christian youths. In line with Somefun's results, Gyimah et al. (2013) conducted a study among Kenyan youths in Nairobi, finding that higher levels of religiosity and engagement in church activities was significantly associated with conservative views regarding premarital sex.

According to the above, since this study's finding regarding religion and RSB (no associations between religion and RSB) is not in accordance with relevant literature, further research is needed to explore the role of religion in RSB among residents in sub-Saharan countries.

Type of Place of Residence

According to the results of this study, compared to urban residents, those residing in rural areas had a higher odd of engaging in RSB. This finding is supported by Voeten et al. (2004), who found in a Kenyan study that rural women had more RSB compared to their urban counterparts as well as less consistent condom use with nonspousal partners. On the contrary, Uchudi et al. (2012) stated that risky behavior was common in people residing in urban areas compared to those in rural areas. Eliya, Dodoo, and Chika-Ezeh (2002) argued that RSB is more common amongst poor people in urban areas and Holmqvist (2009) agreed, writing that the urban poor (especially women) engage in RSB to be able to secure a better future. From a broader perspective, some researchers have argued that RSB is higher in urban areas due to factors such as commercial sex, night life, and less strict cultural rules toward sexual relationships (DiClementi et al., 1993; Munguti et al, 1997). However, after analyzing the relationship between poverty and risky sexual behavior in Tanzania, Silas (2013) found that type of place of residence has no effect on sexual risk behavior for both men and women.

Findings to Social Cognitive Theory Framework

I applied the SCT, as theorized by Albert Bandura, to address the individual, the environment and the behavior in the context of self-efficacy. To account for engagement in RSB, I addressed the self-efficacy of participants through education and wealth.

According to some studies, engaging in RSB affect those with higher income (Dintwa, 2012;Kongnyuy et al., 2005). Contrarily, Booysen (2004) in his study found that RSB is associated with poverty. According to Bandura (1990), awareness or higher levels of education of health risk are important conditions of self-directed changed. However, after conducting a study investigating how SC correlates of sexual experience and condom use, Dilorio and colleagues (2001) found that self-efficacy lack significance regardless of participants being aware or not. It often expected that people with higher education and higher economic status have heightened awareness and knowledge of health risk. In this study, I looked at education and economic status as a determent of RSB. Based on my results, people with high economic status and education had low RSB. Therefore, from every indication, self-efficacy plays a very important role in predicting RSB. This study acknowledges the fact that self-efficacy, in the context of education and economic status is directly associated with RSB and relates to other studies indicating a direct significant association between RSB and self-efficacy (HSU et al., 2015). Awareness and knowledge of health risk are important determinants of behavioral change.

Limitations of the Study

For this study cross-sectional data were used, thus inferring causality was impossible. To address this drawback as much as possible, multiple regression models were applied and evaluated. However, both regression models used in this study did not fit the data satisfactory, thus further research is needed to include more factors to better predict the outcome. In addition, measure of wealth was distinctive to each country, thus it is important to note that the classification of rich households in Cameroon, for instance, may not be necessarily rich in the household in Rwanda or Zimbabwe. Another key limitation was the self-reporting of these data. Researchers are very skeptical about the accuracy of self-reported data on sexual and behavioral health (Cleland et al., 2004). Women may under-report multiple sexual partners compared to men (Nnko et al., 2004), which may deter the result to some extent. On the other hand, men who have never been married may exaggerate their sexual experience in an effort to swell their ego. This reporting differences may distort the results. Finally, the study was restricted to women and men aged 15-49, therefore, findings may not be generalizable to adults older than 49 or adolescents younger than 15.

Recommendations

The findings point towards several policy recommendations and directions for future research. There are several recommendations that may advance RSB research in sub-Saharan Africa. First this study needs to be replicated to include other socio-economic status such as occupation and other RSB such as early sexual debut, transactional sex and inter-generational sex. Secondly, the sample was limited to three

countries due to lack of sufficient and adequate data. It will be imperative to study more than one country in this scenario to have a comprehensive assessment representative of sub-Saharan Africa. In addition, since educational attainment is associated with low RSB, higher education should be considered as a risk reduction policy and ways to promote wealth building should be encouraged.

Positive Social Change

The purpose of this section is to provide recommendation to professional practice and positive social change implications relevant to RSB in sub-Saharan Africa. As indicated by the literature, there are factors promoting RSB and it is important for the wider population to understand the effects of RSB to be able to take precautionary measures.

This study's findings support Walden's mission by understanding of the determinants of the odds of engaging in RSB. The purpose was to use the results to identify factors associated with RSB in sub-Saharan Africa. This investigation suggests that in sub-Saharan Africa, there is the need to promote wealth generating ventures and also encourage higher education. According to the results of this study, higher educated participants and wealthy individuals exhibited lower RSB. Indicating that people classified as no education, primary education, and also those that fall under the poor category were more likely to engage in RSB. Those that fall in the high RSB category need effective sexual health education about the risk and consequences of engaging in RSB. This can be done from a bottom approach by making education a priority for all children. In most sub-Saharan countries, poor families cannot afford tuition for their

children. These children are most often involved in some trade to supplement the family income. In some cultures, boys are often preferred over girls to get an education when tuition money is not enough to accommodate all the children. This suggest that policy makers could implement a policy wherein basic education is free for all. In addition, wealth generating policies should also be implemented to RSB among poor individuals. For example, policy makers can implement social protection policies that can increase household living standards and mitigate or prevent factors that influence RSB.

Secondly, there was no significant relationship between gender, religion and RSB. This suggests that more investigation need to be done to look at the differences of RSB between men and women to be able to implement gender-focus policies. Despite the insignificance of our results, literature suggest that women are more at risk of engaging in RSB. Therefore, policy makes should design intervention programs that educate women on RSB. Religion on the other hand is an important determinant of sexual behavior due to religious injunctions against premarital sex, multiple sexual partners, transactional sex, and intergenerational sex. Agardh, Tumwine, and Ostergren (2005) conducted a study in Tanzania to look at religious factors upon sexual behavior, they found that, the role of religion had no impact on condom use while Protestant female students were more likely to have had three or more lifetime partners. Studies have indicated that religion is strongly associated with RSB especially among youths (Garofalo et al., 2015; Gyimah et al., 2013; Somefun, 2019). Therefore, policy makers and religious leaders should organize religious events to improve the spirituality of young people. Activities can be in the form of retreats, or sporting events which can carry sexual health education messages.

These interventions should also be tailored to suit different religion bearing in mind the differences in disseminating sensitive information to their various congregation.

Moreover, from the above results, adolescents or those in the age group 15-19 were at higher odds of engaging in RSB. Several studies have indicated that adolescent's sexual behavior is a major public health concern due to their incompetence to manage the outcome of RSB. In sub-Saharan Africa where HIV/AIDS is very high, it is imperative to understand patterns of early sexual debut, inconsistent use of condoms, and multiple sexual partners among adolescents to enable the implementation of policies geared towards controlling these factors. Policy makers should prioritize in adolescent targeted interventions. Policies geared towards school attendance should be prioritized since research has shown that education-focused adolescents engage in less risky sex and most often delay early sexual debut (Amy & Meredith, 2011; Heeren et al., 2014). In addition, policy makers and educational administrators should mandate sexual health education in school curriculums.

Finally, the odds of engaging in RSB is high for rural compared to urban areas in this study. This is a very important factors due to differences in access to healthcare, education and wealth. This finding suggests the need to define intervention programs suitable to individuals in rural and urban settings bearing in mind differences in socio-economic status, access to healthcare, religion and culture.

Conclusion

In this research, I identified the association between socio-economic factors and RSB in Cameroon, Zimbabwe, and Rwanda adjusting for age, religion, sex, and place of

residence. This investigation was a secondary data analysis looking at three African countries, future investigations will need to be done to explore determinants at a larger scale investigating more than three countries and more factors of RSB. A larger scale investigation including other sub-Saharan African countries will enable a generic statement on the influence of socio-economic factors on RSB in sub-Saharan African countries. Moreover, future investigations at a larger scale will give a more exhaustive conceptual antecedent shape sexual behaviors in sub-Saharan Africa.

Odimegwu and colleagues (2016), noted the need to further research in this area and incorporating qualitative studies. They also suggest the need for policy makers to design programs that will facilitate the understanding of the weight of RSB. Programs that will promote education and generate wealth need to be instituted to reduce the rate of high RSB among the uneducated and poor. Policies have to emphasize the provision of sexual health outreach strategies for everybody most especially adolescents who are at higher risk of engaging in risky sex. These results suggest research incorporating qualitative studies is highly recommended. Policy makers should design specific country programs that are aimed at enabling communities understand the intensity of risk associated with behaviors such as inconsistent condom use, multiple sexual partners, sexual debut, transactional sex, intergenerational sex and to make healthier choices in their sex life.

References

- Adedimeji, A., Sinayobye, J., Asimwe-Kateera, B., Chaudhry, J., Buzinge, L., Gitembagara, A., ... Anastos, K. M. (2019). Social contexts as mediator of risk behaviors in Rwandan men who have sex with men (MSM): Implications for HIV and STI transmission. *PloS ONE*. <https://doi.org/10.1371/journal.pone.0211099>
- Agajie, M., Belachew, T., Tilahun, T., & Amentie, M. (2015). Risky sexual behavior and associated factors among high school youth in Pawe Woreda, Benishangul Gumuz Region. *Science Journal of Clinical Medicine*, 4(4),67–75.
- Agardh, A., Tumwine, G., & Ostergren, P. (2011). The impact of socio-demographic and religion upon sexual behavior among Uganda university students. *PLOS ONE*. <https://doi.org/10.1371/journal.pone.0023670>
- Agha, S., Hutchinson, P., & Kusanthan, T. (2005). The effects of religious affiliation on sexual initiation and condom use in Zambia. *Journal of Adolescent Health*, 38(5), 550-555.
- Agyei, W. K. A., & Abrefa-Gyan, T. (2016). Risky sexual behavior and condom use among youth in Botswana. *Journal of Human Ecology*, 55(3), 141-151
- Amado, M. A., Vega, B. R., Jiménez, M. C., & Piña, J. A. (2007). Factors influencing condom use in women of reproductive age in Tunja, Columbia. *Columbian Act of Psychology*, 10, 143-151.
- Amy, A., & Meredith, G. (2011). Education and risky sex in Africa: Unraveling the link between women's education and reproductive health behaviors in Kenya. *Social Science Research*, 40(2), 654–666.

- Avert. (2018). HIV and AIDS in Botswana. Retrieved from <https://www.avert.org/professionals/hiv-around-world/sub-saharan-africa/botswana>
- Avert. (2019). HIV and AIDS in South Africa. Retrieved from <https://www.avert.org/professionals/hiv-around-world/sub-saharan-africa/south-africa>
- Baker, E. H. (2014). Socioeconomic status, definition. In W. C. Cockerham, R. Dingwall, & S. R. Quah (Eds.), *The Wiley Blackwell encyclopedia of health, illness, behavior, and society* (pp. 2210–2214). Hoboken, NJ: Wiley-Blackwell.
- Bandura, A. (1977). *Social learning theory*. New York, NY: General Learning Press.
- Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (2004). Health promotion by social cognitive means. *Health Education Behavior, 31*(2), 143–164. <https://doi.org/10.1177/1090198104263660>
- Bärnighausen, T., Hosegood, V., Timaeus, I. M., & Newell, M. L. (2007). The socioeconomic determinants of HIV incidence: Evidence from a longitudinal, population-based study in rural South Africa. *AIDS, 21*(Suppl 7), S29–S38. <https://doi.org/10.1097/01.aids.0000300533.59483.95>
- Bengesai, A. V., Khan, H. T. A., & Duber, R. (2018). Effects of early sexual debut on high school completion in South Africa. *Journal of Biosocial Science, 50*(1), 124–143. <https://doi.org/10.1017/S0021932017000104>.

- Berhan, Y., & Berhan, A. (2015b). A meta-analysis of risky sexual behaviour among male youth in developing countries. *AIDS Research and Treatment*, 2015, 580961. <https://doi.org/10.1155/2015/580961>
- Berhan, Y., & Berhan, A. (2015a). Is higher risk sex common among male or female youths? *SAHARA-J: Journal of Social Aspects of HIV/AIDS*, 12(1), 106-115. <https://doi.org/10.1080/17290376.2015.1123641>.
- Biraro, S., Shafer, L. A., Kleinschmidt, I., Wolff, B., Karabalinde, A., Nalwoga, A., ... Grosskurth, H. (2009). Is sexual risk taking behaviour changing in rural south-west Uganda? Behaviour trends in a rural population cohort 1993-2006. *Sexually transmitted Infections*, 85(Suppl_1), i3-i11. <https://doi.org/10.1136/sti.2008.033928>
- Booyesen, F. R. (2004), HIV/AIDS, poverty and risky sexual behavior in South Africa. *African Journal of AIDS Research*, 3(1),57-67. <https://doi.org/10.2989/16085900409490319>.
- Centers for Disease Control and Prevention. (2019). Global HIV & tuberculosis: Cameroon country profile. Retrieved from <https://www.cdc.gov/globalhivtb/where-we-work/cameroon/cameroon.html>
- Chatterji, M., Murray, N., London, D., & Anglewicz, P. (2005). The factors influencing transactional sex among young men and women in 12 sub-Saharan African countries. *Social Biology*, 52(1-2), 56-72.
- Choudhry, V., Agardh, A., Stafström, M., & Östergren, P. O. (2014). Patterns of alcohol consumption and risky sexual behavior: A cross-sectional study among Ugandan

university students. *BMC Public Health*, 14(128). <https://doi.org/10.1186/1471-2458-14-128>

Fekadu, A. D. & Gebrethadkan, F. T. (2014). Risky sexual behavior and associated factors among Grade 9-12 students in Humera Secondary School, Western Zone of Tigray, NW Ethiopia, 2014. *Science Journal of Public Health*, 2, 410-416. <https://doi.org/10.11648/j.sjph.20140205.16>

Demographic Health Survey. (2012). HIV prevalence in Cameroon: Findings from the 2011 DHS-MICS. Retrieved from <https://dhsprogram.com/pubs/pdf/HF42/HF42.pdf>

DiClemente, R. T., Brown, L. K., Beausoleil, N. I., & Lodico, M. (1993). Comparison of AIDS knowledge and HIV-related sexual behaviors among adolescents in low and high AIDS prevalence communities. *Journal of Adolescent Health*, 14(3), 231-236.

Dintwa, K. F. (2012). Economic status, education and risky sexual behavior for urban Botswana women. *Journal of International Women's Studies*, 13(3), 153-170. Retrieved from http://www.bridgew.edu/soas/jiws/Vol13_no3/11_Dintwa.pdf

Doyle, A. M., Floyd, S., Baisley, K., Orindi, B., Kwaro, D., Mthiyane, T. N.,...

Birdthistle, I. (2018). Who are the male sexual partners of adolescent girls and young women? Comparative analysis of population data in three settings prior to DREAMS roll-out. *PloS One*, 13(9), e0198783. <https://doi.org/10.1371/journal.pone.0198783>

- Dunkle, K. L., & Decker, M. R. (2013). Gender-based violence and HIV: Reviewing the evidence for links and causal pathways in the general population and high-risk groups. *American Journal of Reproductive Immunology*, *69*, 20-26.
- Durowade, K. A., Babatunde, O. A., Omokanye, L. O., Elegbede, O. E., Ayodele, L. M., Adewoye, K. R.,... Olaniyan, T. O. (2017). Early sexual debut: Prevalence and risk factors among secondary school students in Ido-ekiti, Ekiti state, South-West Nigeria. *African Health Sciences*, *17*(3), 614–622.
<https://doi.org/10.4314/ahs.v17i3.3>
- Dupas, P., Huillery, E., & Seban, J. (2017). Risk information, risk salience, and adolescent sexual behavior: Experimental evidence from Cameroon. *Journal of Economic Behavior and Organization*, *145*, 151-175.
<https://doi.org/10.1016/j.jebo.2017.10.007>
- Eggebeen, D., & Dew, J. (2009). The role of religion in adolescence for family formation in young adulthood. *Journal of Marriage and the Family*, *71*(1), 108–121.
<https://doi.org/10.1111/j.1741-3737.2008.00583.x>
- Ekundayo, O. J., Dodson-Stallworth, J., Roofe, M., Aban, I. B., Bachmann, L. H., Kempf, M. C.,... Jolly, P. E. (2007). The determinants of sexual intercourse before age 16 years among rural Jamaican adolescents. *The Scientific World Journal*, *7*, 493–503. <https://doi.org/10.1100/tsw.2007.94>
- Fatusi, A. O., & Blum, R. W. (2008). Predictors of early sexual initiation among a nationally representative sample of Nigerian adolescents. *BMC Public Health*, *8*, 136. <https://doi.org/10.1186/1471-2458-8-136>

- Fentahun, N., & Mamo, A. (2014). Risky sexual behaviors and associated factors among male and female students in Jimma Zone preparatory schools, South West Ethiopia: Comparative study. *Ethiopian Journal of Health Sciences*, 24(1), 59-68.
- Fagbamigbe, A. F., Lawal, A. M., & Idemudia, E. S. (2017). Modelling self-assessed vulnerability to HIV and its associated factors in a HIV-burdened country. *SAHARA J: Journal of Social Aspects of HIV/AIDS Research Alliance*, 14(1), 140–152. <https://doi.org/10.1080/17290376.2017.1387598>
- Folayan, M. O., Adebajo, S., Adeyemi, A., & Ogungbemi, K. M. (2015). Differences in sexual practices, sexual behavior and HIV risk profile between adolescents and young persons in rural and urban Nigeria. *PloS One*, 10(7), e0129106. <https://doi.org/10.1371/journal.pone.0129106>
- Gebremedhin A. T., Gesesew H. A., Demissie T. D., Kerie M. W., & Sudhakar M. (2013). Khat chewing and risky sexual behavior in sub-Saharan Africa: A systematic review protocol. *JBIR Database of Systematic Reviews and Implementation Reports*, 11(12), 59–67. <https://doi.org/10.11124/jbisrir-2013-877>
- Gillespie, S., & Kadiyala, S. (2005). *HIV/AIDS and food and nutrition security: From Evidence to Action*. Washington, DC: International Food Policy Research Institute.
- Gizaw, A., Jara, D., & Ketema, K. (2014). Risky sexual practice and associated factors among high school adolescent in Addis Ababa, Ethiopia, 2014. *Family Medicine & Medical Science Research*, 3(4). <https://doi.org/10.4172/2327-4972.1000141>

- Glanz, K., Rimer, B. K., & Viswanath, K. (2008). *Health behavior and health education: Theory, research, and practice* (4th ed.). San Francisco, CA: Jossey-Bass
- Gyimah, S. O., Kodzi, I., Emina, J., Cofie, N., & Ezeh, A. (2013). Religion, religiosity and premarital sexual attitudes of young people in the informal settlements of Nairobi, Kenya. *Journal of Biosocial Science, 45*, 13-29.
- Hadish, M. T., Mao, J., Gong, G., Hadish, B. T., & Tesfamariam, E. H. (2017). Predictors of high HIV/AIDS risk sexual behaviors: Comparison study among Cameroonian and Gabonese youth age 15-24 years. *Journal of HIV and Retro Virus, 3*(1).
- Hargreaves, J. R., & Glynn, J. R. (2002). Educational attainment and HIV-1 infection in developing countries: Systematic review. *Tropical Medicine International Health, 7*(6), 489-498. <https://doi.org/10.1046/j.1365-3156.2002.00889.x>
- Heeren, G. A., Mandeya, A., Jemmott, J. B., Chiruka, R. T., Marange, C. S., Batidzirai, J. M.,... Hsu, J. (2014). Multiple partners and condom use among students at a south African University. *Journal of Evidenced-Based Social Work, 11*(5), 437-444.
- Hsu, H., Yu, H., Lou, J., & Eng, C. (2015). Relationships among sexual self-concept and sexual risk cognition toward sexual self-efficacy in adolescents: Cause-and-effect model testing. *Japan Journal of Nursing Science, 12*, 124-134.
<https://doi.org/10.1111/jjns.12056>
- Holmqvist, G. (2009). HIV and income inequality: If there is a link, what does it tell us? *International Policy Center for Inclusive Growth, 83*.

- Institut National de la Statistique & ICF. (2011). *Cameroun. In: Enquête Démographique et de Santé et à Indicateurs Multiples 2011*. Calverton, MD:Author.
- Jewkes, R. (2010). Where to for sexual health education for adolescents in sub-Saharan Africa? *PLoS medicine*, 7(6), e1000288.
<https://doi.org/10.1371/journal.pmed.1000288>
- Jewkes, R., Dunkle, K. L., Nduna, M., & Shai, N. J. (2012). Transactional sex and HIV incidence in a cohort of young women in the Stepping Stones trial. *Journal of AIDS and Clinical Research*, 3(5). <https://doi.org/10.4172/2155-6113.1000158>
- Kassa, G. M., Degu, G., Yitayew, M., Misganaw, W., Muche, M., Demelash, T.,... Ayehu, M. (2016). Risky sexual behavior and associated factors among Jiga high school and preparatory school students, Amhara Region, Ethiopia. *International Scholarly Research Notices*, 2016, 1-7. <https://doi.org/10.1155/2016/4315729>
- Kharsany, A. B., & Karim, Q. A. (2016). HIV infection and AIDS in sub-Saharan Africa: Current status, challenges and opportunities. *The Open AIDS Journal*, 10, 34-48.
<https://doi.org/10.2174/1874613601610010034>
- Kilburn, K., Ranganathan, M., Stoner, M. C. D., Hughes, J. P., MacPhail, C., Agyei, Y., Gómez-Olivé, F. X.,... Pettifor, A. (2018). Transactional sex and incident HIV infection in a cohort of young women from rural South Africa. *AIDS*, 32(12), 1669–1677. <https://doi.org/10.1097/QAD.0000000000001866>
- Kim, J., Pronyk, P., Barnett, T., & Watts, C. (2008). Exploring the role of economic empowerment in HIV prevention. *AIDS*, 22(Suppl 4), S57–S71.
<http://dx.doi.org/10.1097/01.aids.0000341777.78876.40>

- Kimuna, S., & Djamba, Y. (2005). Wealth and extra marital sex among men in Zambia. *International Family Planning Perspective*, 31(2), 83-89.
doi:10.1363/ifpp.31.83.05
- Kirk, D. (1996). Demographic transition theory. *Population Studies* 50(3), 361–387.
- Kirunga, C. T. & Ntozi, J. P. (1997). Socio_Economic determinants of HIV Serostatus: A study of Rakai district, Uganda. *Health Transition Review*, 7(1), 175-188
- Kongnyuy, E. J., & Wiysonge, C. S. (2007). Alcohol use and extramarital sex among men in Cameroon. *BMC International Health and Human rights*, 7, 6.
doi:10.1186/1472-698X-7-6
- Kongnyuy, E. J., Wiysonge, C. S., Mbu, R. E., Nana, P., & Kouam, L. (2006). Wealth and sexual behavior among men in Cameroon. *BMC International Health and Human Rights*, 6(11).
- Lawal, A. M., & Olley, B. O. (2017). Psychosocial factors predicting risky sexual behaviour among long distance truck drivers in Lagos, Nigeria. *SAHARA Journal of Social Aspects of HIV/AIDS Research Alliance*, 14(1), 213-221.
- Leclerc-Madlala, S. (2003). Transactional sex and the pursuit of modernity. *Social Dynamics*, 29(2), 213–233
- Lendzele, S. (2018). HIV/AIDS in a community of Western Cameroon. *Intech Open*. doi: 10.5772/intechopen.77086
- Li, J., Li, S., Yan, H., Xu, D., Xiao, H., Cao, Y., & Mao, Z. (2015). Early sex initiation and subsequent unsafe sexual behaviors and sex-related risks among female

- undergraduates in Wuhan. *China Asia-Pacific Journal of Public Health*. 27(2 suppl), 21S–29S.
- Lowry, R., Dunville, R., Robin, L., & Kann, L. (2017). Early Sexual Debut and Associated Risk Behaviors Among Sexual Minority Youth. *American Journal of Preventive Medicine*, 52(3), 379-384. doi:10.1016/j.amepre.2016.10.008.
- Lucas, A. M., & Wilson, N. L. (2018). Schooling, Wealth, Risky Sexual Behavior, and HIV/AIDS in Sub-Saharan Africa. *The Journal of Development Studies*. doi: 10.1080/00220388.2018.1493195
- Lucea, M. B., Hindin, M. J., Gultiano, S., Kub, J., & Rose, L. (2013). The context of condom use among young adults in the Philippines: implications for HIV prevention. *Health Care for Women International*, 34(3-4), 227–248. <https://doi.org/10.1080/07399332.2012.721414>
- Ma, Q., Ono-Kihara, M., Cong, L., Xu, G., Pan, X., Zamani, S., ... Kihara, M. (2009). Early initiation of sexual activity: a risk factor for sexually transmitted diseases, HIV infection, and unwanted pregnancy among university students in China. *BMC Public Health*, 9, 111. doi:10.1186/1471-2458-9-111
- Mabala, R. (2006). From HIV prevention to HIV protection: addressing the vulnerability of girls and young women in urban areas. *Environ Urban*, 18(2), 407–432. doi: 10.1177/0956247806069624.
- Macai, M., Maharaj, P., & Gresh, A. (2011). Masculinity and male sexual behavior in Mozambique. *Cultural Health Sex*, 13(10), 1181-1192. doi: 10.1080/13691058.2011.611537

- MacPhail, C. & Campbell, C. (2001). 'I think condoms are good ut, aai, I hate those things': Condom use among adolescents and young people in a Southern African township. *Social Science and Medicine*, 52(11), 1613-1627, doi:10.1016/S0277-9536(00)00272-0
- Madise, N., Zulu, E., Cierra, J. (2007). Is Poverty a Driver for Risky Sexual Behavior? Evidence from National Surveys of Adolescents in four African Countries. *African Journal of Reproductive Health*, 11(3), 83-98.
- Magnusson, B. M., Nield, J. A., & Lapane, K. L. (2015). Age at first intercourse and subsequent sexual partnering among adult women in the United States, a cross-sectional study. *BMC Public Health*, 15, 98. doi:10.1186/s12889-015-1458-2
- Maonga, B. B., Gondwe, T. S., & Machira, K. (2018). Determinants of Risky Sexual Behavior Among the Youth in Malawi. USAID, DHS Working Paper. Retrieved from No. 141. Retrieved from <https://dhsprogram.com/pubs/pdf/WP141/WP141.pdf>
- Marume, A., Maradzika, J., & January, J. (2018). Adolescent sexting and risky sexual behaviors in Zimbabwe: A cross-sectional study. *Sexuality & Culture*, 22(3), 931-941. <https://doi.org/10.1007/s12119-018-9508-4>
- Mavhu, W., Rowley, E., Thior, I., Kruse-Levy, N., Mugurungi, O., Ncube, G., & Leclerc-Madlala, S. (2018). Sexual behavior experiences and characteristics of male-female partnerships among HIV positive adolescent girls and young women: Qualitative findings from Zimbabwe. *PloS One*, 13(3), e0194732. doi:10.1371/journal.pone.0194732

- Mboti, C. I., Davies, A., & Zuma, K. (2006). Human Immunodeficiency virus and Hepatitis C Co-infection in sub-Saharan West Africa. *British Journal of Biomedical Science*, 63(1), 29-37.
- MEASURE DHS. (2008). Demographic and Health Surveys. Retrieved from <http://www.measuredhs.com/aboutsurveys/dhs/start.cfm>
- Mishra, V., Bignami, S., Greener, R., Vaessen, M., Hong, R., Ghys, P., ... Rutstein, S. (2007). A study of the association of HIV infection with wealth in sub-Saharan Africa. Retrieved from <https://dhsprogram.com/pubs/pdf/WP31/WP31.pdf>
- Mitsunaga, T. M. & Powell, A. M. (2005). Extramarital sex among Nigerian men: Polygyny and other risk factors. *Journal of Acquired Immune Deficiency Syndrome*. 39(4), 478-488. Doi:10.1097/01.qai.0000152396.60014.69
- Morris, L., Kouya, F., Kwalar, R., Pilapil, M., Saito, K., Palmer, N., ... Jao, J. (2014). Factors associated with inconsistent condom use in adolescents with negative or unknown HIV status in Northwest Cameroon. *AIDS Care*, 26(11), 1440–1445. doi:10.1080/09540121.2014.920948
- Mumah, J. N., & Jackson-Smith, D. (2014). Why are the benefits of increased resources not impacting the risk of HIV infection for high SES women in Cameroon? *PloS One*, 9(6), e100507. doi:10.1371/journal.pone.0100507
- Munguti, K., Grosskurth, H., Newell, J., Senkoro, K., Mosha, F., Todd, J., ... Hayes, R. (1997). Patterns of sexual behaviour in a rural population in north-western Tanzania. *Social Science & Medicine*, 44(10), 1553-1561. [https://doi.org/10.1016/S0277-9536\(97\)00014-2](https://doi.org/10.1016/S0277-9536(97)00014-2)

- Naicker, N., Kharsany, A. B., Werner, L., van Loggerenberg, F., Mlisana, K., Garrett, N., & Abdool Karim, S. S. (2015). Risk Factors for HIV Acquisition in High Risk Women in a Generalised Epidemic Setting. *AIDS and Behavior, 19*(7), 1305–1316. doi:10.1007/s10461-015-1002-5
- Namisi, F. S., Aarø, L. E., Kaaya, S., Onya, H. E., Wubs, A., & Mathews, C. (2013). Condom use and sexuality communication with adults: a study among high school students in South Africa and Tanzania. *BMC Public Health, 13*, 874. doi:10.1186/1471-2458-13-874
- Ngidi, N. D., Moyo, S., Zulu, T., Adam, J. K., & Krishna, S. B. (2016). Qualitative evaluation of selected social factors that impact sexual risk-taking behaviour among African students in Kwazulu-Natal, South Africa. *SAHARA J: Journal of Social Aspects of HIV/AIDS Research Alliance, 13*(1), 96–105. doi:10.1080/17290376.2016.1218792
- Noubiap, J. J., Nansseu, J. R., Ndoula, S. T., Wang, B., Jingi, A. M., Bigna, J. J., ... Fokom-Domgue, J. (2015). Prevalence and correlates of HIV-risky sexual behaviors among students attending the Medical and Social Welfare Center of the University of Maroua, Cameroon. *BMC Research Notes, 8*, 635. doi:10.1186/s13104-015-1638-2
- Nyambi, P., Zinkeng, L., Kenfack, H., Tongo, M., Nanfack, A., Ndonko, F., ... Marmor, M. (2002). HIV infection in rural villages in Cameroon. *Journal of Acquired Immune Deficiency Syndrome, 31*, 506-513

- Odimegwu, C., Somefun, O. D., & Chisumpa, V. H. (2019). Regional differences in positive sexual behavior among youth in sub-Saharan Africa. *Journal of Biosocial Sciences*, *51*(2), 254-272. doi: 10.1017/S002193201800010X
- Odimegwu, C. O., De Wet, N., Banda, P. C. (2016). Risky sexual behavior among women: Does economic empowerment matter? Case of Gabon, Mozambique, Sierra Leone and Zambia. *African Journal of AIDS Research*, *15*(4), 333-340. doi:10.2989/16085906.2016.1238401
- Olesen, T. B., Jensen, K. E., Nygard, M., Tryggvadottir, L., Sparen, P., Hansen, B. T. ... Kjaer, S. K. (2012). Young Age at first intercourse and risk-taking behaviors: A study of nearly 65 000 women in four Nordic countries. *European Journal of Public Health*, *22*(2), 220-224. Doi: 10.1093/eurpub/ckr055
- Ringheim, K., & Gribble, J. (2010). Improving the reproductive health of sub-Saharan Africa's youth. A route to achieve the Millennium Development Goals. *Population Reference Bureau, Washington, DC*.
- Rositch, A. F., Cherutich, P., Brentlinger, P., Kiarie, J. N., Nduati, R., & Farquhar, C. (2012). HIV infection and sexual partnerships and behaviour among adolescent girls in Nairobi, Kenya. *International Journal of STD & AIDS*, *23*(7), 468-474. doi:10.1258/ijsa.2012.011361
- Ross, J. M., Duperrouzel, J., Vega, M., & Gonzalez, R. (2016). The Neuropsychology of Risky Sexual Behavior. *Journal of the International Neuropsychological Society: JINS*, *22*(6), 586-594. doi:10.1017/S1355617716000400

- Rugigana, E., Birungi, F., & Nzayirambaho, M. (2015). HIV knowledge and risky sexual behavior among men in Rwanda. *The Pan African Medical Journal*, 22, 380. doi:10.11604/pamj.2015.22.380.6661
- Rutstein, S., & Staveteig, S. (2014). Making the demographic and health surveys wealth index comparable. DHS Methodological Report No 9. Rockville, Maryland, USA.
- Safren, S. A., Traeger, L., Skeer, M. R., O'Cleirigh, C., Meade, C. S., Covahey, C., & Mayer, K. H. (2010). Testing a social-cognitive model of HIV transmission risk behaviors in HIV-infected MSM with and without depression. *Health Psychology*, 29(2), 215-21.
- Sani, A. S., Abraham, C., Denford, S., & Ball, S. (2016). School-based sexual health education interventions to prevent STI/HIV in sub-Saharan Africa: a systematic review and meta-analysis. *BMC Public Health*, 16(1), 1069. doi:10.1186/s12889-016-3715-4
- Sandfort, T. G., Orr, M., Hirsch, J. S., & Santelli, J. (2008). Long-term health correlates of timing of sexual debut: results from a national US study. *American Journal of Public Health*, 98(1), 155–161. doi:10.2105/AJPH.2006.097444
- Schaefer, R., Gregson, S., Eaton, J. W., Mugurungi, O., Rhead, R., Takaruza, A., Maswera, R., ... Nyamukapa, C. (2017). Age-disparate relationships and HIV incidence in adolescent girls and young women: evidence from Zimbabwe. *AIDS*, 31(10), 1461-1470.
- Schur, N., Mylne, A., Mushati, P., Takaruza, A., Ward, H., Nyamukapa, C., & Gregson, S. (2015). The effects of household wealth on HIV prevalence in Manicaland,

- Zimbabwe - a prospective household census and population-based open cohort study. *Journal of the International AIDS Society*, 18(1), 20063.
doi:10.7448/IAS.18.1.20063
- Setia M. S. (2016). Cross-sectional Studies. *Indian Journal of Dermatology*, 61(3), 261–264. doi:10.4103/0019-5154.182410
- Shai, N. J., Jewkes, R., Nduna, M., & Dunkle, K. (2012). Masculinities and condom use patterns among young rural South Africa men: a cross-sectional baseline survey. *BMC Public Health*, 12, 462. doi:10.1186/1471-2458-12-462
- Silas, J. (2013). Poverty and risky sexual behavior: Evidence from Tanzania. *United States Agency for International Development*, 88.
- Simons, L. G., Burt, C. H., & Peterson, R. F. (2009). The Effects of Religion on Risky Sexual Behavior Among College Students. *Deviant Behavior*, 30, 467-485.
- Slymaker, E., Walker, N., Zaba, B., Collumbien, M. (2004). Unsafe Sex. In Ezzati, M., Lopez, A. D., Rodgers, A., Murray, C. J. L. (Eds). *Comparative Quantification of Health Risks: Global and Regional Burden of Disease Attributable to Selected Major Risk Factors* (pp. 1177-1254). Geneva, Switzerland: World Health Organization.
- Snead, M. C., O’Leary, A. M., Mandel, M. G., Kourtis, A. P., Wiener, J., Jamieson, D. J., ... Margolis, A. D. (2014). Relationship between social cognitive theory constructs and self-reported condom use: assessment of behaviour in a subgroup of the Safe in the City trial. *BMJ Open*, 4(12), e006093. doi:10.1136/bmjopen-2014-006093

- Tanga, P. T., & Tangwe, M. N. (2014). Interplay between economic empowerment and sexual behaviour and practices of migrant workers within the context of HIV and AIDS in the Lesotho textile industry. *SAHARA J: Journal of Social Aspects of HIV/AIDS Research Alliance*, *11*(1), 187–201.
doi:10.1080/17290376.2014.976250.
- Tadesse, G., & Yakob, B. (2015). Risky sexual behaviors among female youth in Tiss Abay, a semi-urban area of the Amhara Region, Ethiopia. *PloS One*, *10*(3), e0119050. doi:10.1371/journal.pone.0119050
- Teva, I., Bermúdez, M., Buela-Casal, G. (2011). Search for sexual sensations, coping styles, social stress and its relationship with adolescent sexual behavior. *Annals of Psychology*, *27*, 35-46.
- Torrone, E. A., Morrison, C. S., Chen, P. L., Kwok, C., Francis, S. C., Hayes, R. J., ... STIMA Working Group. (2018). Prevalence of sexually transmitted infections and bacterial vaginosis among women in sub-Saharan Africa: An individual participant data meta-analysis of 18 HIV prevention studies. *PLoS Medicine*, *15*(2), e1002511. doi:10.1371/journal.pmed.1002511
- The 2015 Zimbabwe Demographic and Health Survey. 2016. Final Report. Retrieved from <https://www.dhsprogram.com/pubs/pdf/FR322/FR322.pdf>.
- The 2016 Ethiopia Demographic Health Survey (2017). Final Report. Retrieved from <https://www.dhsprogram.com/pubs/pdf/FR328/FR328.pdf>
- The 2013-2014 DRC Demographic and Health Survey (2014). Final Report. Retrieved from <https://www.dhsprogram.com/pubs/pdf/FR300/FR300.pdf>

The 2014-2015 Rwanda Demographic and Health Survey (2016). Final Report. Retrieved

from <https://www.dhsprogram.com/pubs/pdf/FR316/FR316.pdf>

The 2011 Cameroon Demographic and Health Survey (2012). Final Report. Retrieved

from <https://www.dhsprogram.com/pubs/pdf/FR260/FR260.pdf>

Uchudi, J., Magadi, M., & Mostazir, M. (2012). A multilevel analysis of the determinants of high risk sexual behavior (multiple sexual partners) in sub-Saharan Africa.

Journal of Biosocial Science, 44(3),289-311. doi: 10.1017/S0021932011000654

United Nations. (2012). Women out loud: How women living with HIV will help the world end AIDS, in United Nations Joint Programme on HIV/AIDS. Geneva, Switzerland: Joint United Nations Program on HIV/AIDS (UNAIDS).

USAIDS (2011). *The epidemiology of HIV epidemics in the 21-country West Africa Region: The impact of most at risk populations (MARPs)*, pp. 1–50.

UNAIDS (2016). Prevention Gap Report. Retrieved from

http://www.unaids.org/sites/default/files/media_asset/2016-prevention-gap-report_en.pdf

UNAIDS. (2018). At a Glance. Retrieved from

http://www.unaids.org/sites/default/files/women_girls_hiv_sub_saharan_africa_en.pdf

UNAIDS (2017). UNAIDS Data 2017. Retrieved from

http://www.unaids.org/sites/default/files/media_asset/20170720_Data_book_2017_en.pdf

- UNAIDS (2016). *HIV prevention among adolescent girls and young women: putting HIV prevention among adolescent girls and young women on the Fast-Track and engaging men and boys*. Geneva: Joint United Nations Programme on HIV/AIDS.
- UNAIDS (2013). *Global Report on the Global AIDS epidemic*. Geneva, Switzerland: Joint United Nations Program on HIV/AIDS (UNAIDS).
- UNAIDS (2005) *Annual Report 2004*. Johannesburg, South Africa: UNAIDS Regional Support Team for East and Southern Africa.
- United Nations Children's Fund (2015). *Synthesis report of the rapid assessment of adolescent and HIV Programme Context in 5 countries: Botswana, Cameroon, Jamaica, Swaziland and Zimbabwe*. UNICEF, New York,
- UNESCO (2003). *UNESCO's Gender Mainstreaming Implementation Framework: Baseline definitions of key concepts and terms*. Retrieved from <http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/BSP/GENDER/PDF/1.%20Baseline%20Definitions%20of%20key%20gender-related%20concepts.pdf>
- United Nations Women. (2018). *Facts and Figures: HIV and AIDS, Prevalence and New Infections*. Retrieved from <http://www.unwomen.org/en/what-we-do/hiv-and-aids/facts-and-figures>
- Vaessen, M., Thiam, M., & Le, T. (2005). *The Demographic and Health Surveys*. In United Nations, *Household sample surveys in developing and transition countries*. New York: United Nations Publications.
- Voeten, H., Egesah, O., & Habbema, J. F. (2004). *Sexual Behavior is more risky in rural than urban areas among young women in Nyanza province Kenya*. *Journal of the*

American Sexually Transmitted Disease Association, 31(8), 481-487. doi:

10.1097/01.olq.0000135989.14131.9d

Wamoyi, J., Stobeanau, K., Bobrova, N., Abramsky, T., & Watts, C. (2016).

Transactional sex and risk for HIV infection in sub-Saharan Africa: a systematic review and meta-analysis. *Journal of the International AIDS Society*, 19(1), 20992. doi:10.7448/IAS.19.1.20992

Wagenlehner, F. M., Brockmeyer, N. H., Discher, T., Friese, K., & Wichelhaus, T. A.

(2016). The Presentation, Diagnosis, and Treatment of Sexually Transmitted Infections. *Deutsches Arzteblatt International*, 113(1-02), 11-22.

Wells, B. E. & Twenge J. (2005). Changes in Young People's Sexual Behavior and

Attitudes, 1943–1999: A Cross-Temporal Meta-Analysis. *Review of General Psychology* 9, 249–261.

World Health Organization (2018a). HIV/AIDS: Data and Statistics. Retrieved from

<https://www.who.int/hiv/data/en/>

World Health Organization (2018b). HIV AIDS: Key Facts. Retrieved from

<https://www.who.int/en/news-room/fact-sheets/detail/hiv-aids>

World Health Organization (n.d). Sexually transmitted infections (STIs) 2013. Fact Sheet

N. 110. Retrieved from www.who.int/mediacentre/factsheets/fs110/en/

World Health Organization (2005). The Democratic Republic of the Congo. Retrieved

from https://www.who.int/hiv/HIVCP_COD.pdf

Wight, D., Plummer, M., & Ross, D. (2012). The need to promote behaviour change at

the cultural level: one factor explaining the limited impact of the MEMA kwa

Vijana adolescent sexual health intervention in rural Tanzania. A process evaluation. *BMC Public Health*, 12, 788. doi:10.1186/1471-2458-12-788

Ziraba, A., Orindi, B., Muuo, S., Floyd, S., Birdthistle, I. J., Mumah, J., Osindo, J., Njoroge, P., ... Kabiru, C. W. (2018). Understanding HIV risks among adolescent girls and young women in informal settlements of Nairobi, Kenya: Lessons for DREAMS. *PloS One*, 13(5), e0197479. doi:10.1371/journal.pone.0197479