



Prevalence and Factors Associated with Risky Sexual Behaviors Among Sexually Active Female Adolescents in Zambia

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Abstract

Despite decades long commitment to women's reproductive health rights, sexually transmitted diseases and unintended pregnancies continue to be major public health concerns in sub-Saharan Africa. In order to provide an evidence base for future policy and services, this study aims to explore the prevalence and factors associated with risky sexual behaviors (RSB) among sexually active Zambian female adolescents using a nationally representative sample. Data on females, aged 15–19 ($n = 3000$), were obtained from the 2018 Zambia Demographic and Health Survey, an interviewer-administered, nationally representative survey that used multistage sampling. The study conducted multiple logistic regression to explore the correlates of RSB. Of the 3000 respondents, 49.7% (1490) reported ever having sexual intercourse of which 71.1% reported engaging in RSB. Among sexually active female adolescents, the following RSB percentage were reported: intercourse before age 16 (50.6%), nonuse of condoms at last intercourse (37.8%), engaging in transactional sex (6.2%), alcohol use at last intercourse (4.6%), and multiple sexual partners (1.9%). Educational attainment and household wealth showed strong inverse trends with RSB risk and there were notably large geographic differences in RSB within Zambia (22.1% in Lusaka region vs. 62.4% in Western province). The multiple logistic regression results revealed that those who were younger, unmarried, with less than secondary education, without access to Internet, and residents of Western Zambia were significantly more likely to have engaged in RSB (AOR: 1.74–7.69, $p < 0.05$). Given the negative health outcomes associated with RSB, Zambian adolescent health care programs may strategically target limited resources to the identified risk groups.

Keywords Risky sexual behavior · Adolescents · Zambia · Female

Introduction

Adolescents, defined by the World Health Organization (WHO) as those between 10 and 19 years old, comprise one-sixth of the world population (United Nations, 2019). Currently numbering 1.2 billion individuals, there are more adolescents than any time in history (UNICEF, 2019). Adolescents are vulnerable group for various adverse health

outcomes due to lower perceptions of consequences of risk behaviors (Bozzini et al., 2020; Knoll et al., 2015; Reniers et al., 2016). Globally, adolescents are disproportionately affected by reproductive health morbidities such as sexually transmitted infections (STIs) (Magnusson et al., 2015); moreover, at least one-third of abortion complications worldwide are experienced by women under 20 years old (IPAS, 2019). Although significant progress has been made in recent decades, reproductive health improvements in sub-Saharan Africa have been lagging behind other parts of the world in areas such as contraceptive prevalence (Liang et al., 2019). HIV/AIDS and unintended pregnancies continue to be major causes of mortality and morbidity among adolescents in these regions, necessitating public health action (UNAIDS, 2019; WHO, 2019).

Adolescents' risky sexual behavior (RSB) is associated with negative outcomes and is a major cause of preventable mortality in low-income countries (Amare et al., 2019; Ivanova et al., 2018). RSB is defined as sexual activities

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which expose people to the risk of STIs and/or unintended pregnancies (Chawla & Sarkar, 2019). RSB includes early sexual initiation, sex with multiple partners, having sexual intercourse while intoxicated, transactional sex and unprotected sex (Chawla & Sarkar, 2019). Moreover, engaging in RSB at earlier ages is associated with negative sexual health outcomes including increased risk of STIs, intimate partner violence and unplanned and teenage pregnancies (Bizu & Kassa, 2015; Magnusson et al., 2015). There has been liberalization of sexual attitudes in Africa in recent decades which is likely due to the confluence of increased urbanization, advent of social media and improved female education (Kharono et al., 2022; Lukhele et al., 2016; Masanja et al., 2021; Stoebenau et al., 2015; Wana et al., 2019).

Zambia, a low-income sub-Saharan country at the crossroads of southern, eastern and central Africa, reports an HIV prevalence of 14.5% among women aged 15–49, higher than the reported prevalence in 8.3% in eastern and southern Africa, 1.7% in west and central Africa and 0.8% worldwide (UNAIDS, 2021). In sub-Saharan Africa, female adolescents are six more likely to get HIV than boys (UNICEF, 2021). Of Zambian adolescent females, 29% have begun childbearing with 20% of them giving birth before age 15 (Zambia Statistics Agency, 2020). Compared to the Sustainable Development Goals target of 70 deaths per 100,000 live births, Zambia's current maternal mortality rate is substantially higher at 252 deaths per 100,000 (Zambia Statistics Agency, 2020). In view of these statistics, a better understanding of the factors associated with adolescent RSB is crucial to ensure effective programs and policies mitigating and preventing the negative effects of RSB. Few Zambian studies have focused on a comprehensive range of adolescent RSBs and published studies using national data are not recent (Sandoy et al., 2007). More recently published data mainly come from studies of adolescents living with HIV, studies of a single sexual behavior, or studies limited to specific geographic regions (Kayeyi et al., 2013; Ndongmo et al., 2017; Okawa et al., 2018; Sandoy et al., 2007; Siziya et al., 2008; Yang et al., 2019). In order to address this knowledge gap, this study examined the prevalence and factors associated with a range of adolescent RSBs in Zambian females using nationally representative data. A better understanding of RSB is necessary to aid the progress of international initiatives to improve maternal and child health, universal education and poverty reduction.

Method

Study Design and Sampling Methods

The Zambia Demographic and Health Surveys (ZDHS) are cross-sectional surveys that are periodically conducted to obtain information on demographic, health and nutritional

indicators of non-elderly adults and children. The latest survey was conducted between July 18, 2018, and January 24, 2019 (Zambia Statistics Agency, 2020). This national survey used stratified, two-stage cluster sampling design to obtain a representative sample of 13,625 households (Zambia Statistics Agency, 2020). A detailed explanation of the sampling process is available elsewhere (Zambia Statistics Agency, 2020). Women aged 15–49 years who were either permanent residents or visitors who had stayed in the selected households the night before the survey were eligible with a total of 13,683 women interviewed. Of these, 3000 were adolescents aged 15–19 years who were included in this secondary analysis. Written informed consent was provided by all respondents. Written permission to access the whole ZDHS database was obtained through DHS program website (USAID).

Data Collection and Data Management

Using interviewer-administered questionnaires, the survey obtained sociodemographic information. Moreover, level of education (no education, primary, secondary, and tertiary), marital status (married/not married), working status (working/not working), and religion (Catholic, Protestant, Muslim, Other). Adolescents who were staying and living in an informal but consensual relationship with a partner were considered married. Due to the low literacy rate of Zambia whereby one in four females between 15 and 19 years old was illiterate (Zambia Statistics Agency, 2020), we examined their exposure to newspapers/magazines, radio, Internet, and TV (Yes/No). Additionally, the following household characteristics were asked: quintile of wealth, type of residence (urban or rural), sex of household head, number of household members, and province of residence (Table 1). Respondents were also asked if they ever had sexual intercourse (Yes/No).

We examined the engagement in RSB among sexually active female adolescents as a binary (Yes/No) outcome. Female adolescents were considered to have engaged in RSB if they reported any of the following five behaviors: (1) engaging in sex with more than one partner in the past 12 months, (2) engaging in transactional sex in the past 12 months, (3) alcohol consumption at last sexual intercourse, (4) having had sexual intercourse before age 16 (legal age of consent), or (5) nonuse of condom at last sexual intercourse (Chawla & Sarkar, 2019; Farid et al., 2014; SHRH Africa Trust, 2018). However, respondents who were legally married (above the age 18) but reported

Table 1 Background characteristics of adolescent Zambian females (15–19 years of age)

Characteristics	All females <i>N</i> = 3000	Sexually active <i>N</i> = 1490 <i>n</i> (%)	Non-sexually active <i>N</i> = 1510 <i>n</i> (%)	<i>p</i> value
Age				< 0.001*
15–16 years	1183 (39.4%)	320 (21.5%)	863 (57.2%)	
17–19 years	1817 (60.6%)	1170 (78.5%)	647 (42.8%)	
Education level				< 0.001
Secondary/tertiary	1618 (53.9%)	731 (49.2%)	887 (58.7%)	
Primary education	1283 (42.8%)	695 (46.6%)	588 (38.9%)	
No education	99 (3.3%)	64 (4.2%)	35 (2.3%)	
Marital status				< 0.001
Not married	2563 (85.4%)	1053 (70.6%)	1510 (100%)	
Married	437 (14.6%)	437 (29.4%)	0 (0%)	
Working status				< 0.001*
Not working	2477 (82.6%)	1122 (75.3%)	1355 (89.7%)	
Working	523 (17.4%)	368 (24.7%)	155 (10.3%)	
Religion				0.794
Protestant	2408 (80.3%)	1205 (80.8%)	1203 (79.6%)	
Catholic	560 (18.7%)	269 (18.1%)	291 (19.3%)	
Muslim	7 (0.2%)	3 (0.2%)	4 (0.3%)	
Other religions	25 (0.8%)	14 (0.9%)	11 (0.8%)	
Residence				< 0.001
Urban	1323 (44.1%)	508 (34.1%)	815 (54.0%)	
Rural	1677 (55.9%)	982 (65.9%)	695 (46.0%)	
Household size				< 0.001*
6 and above	2017 (67.2%)	914 (61.3%)	1103 (73.0%)	
< 6 members	983 (32.8%)	576 (38.7%)	407 (27.0%)	
Household head sex				0.298
Male	2166 (72.2%)	1063 (71.4%)	1103 (73.0%)	
Female	834 (27.8%)	427 (28.6%)	407 (27.0%)	
Household wealth				< 0.001*
1st (richest) quintile	709 (23.6%)	186 (12.5%)	523 (34.6%)	
2nd quintile	655 (21.8%)	320 (21.5%)	335 (22.2%)	
3rd quintile	585 (19.5%)	343 (23.0%)	242 (16.0%)	
4th quintile	541 (18.0%)	320 (21.5%)	221 (14.6%)	
5th (poorest) quintile	510 (17.0%)	321 (21.6%)	189 (12.5%)	
Province of residence				< 0.001*
Central	297 (9.9%)	150 (10.1%)	147 (9.7%)	
Copper belt	491 (16.4%)	175 (11.8%)	315 (20.8%)	
Eastern	342 (11.4%)	218 (14.6%)	124 (8.2%)	
Luapula	253 (8.4%)	128 (8.6%)	125 (8.3%)	
Lusaka	475 (15.8%)	164 (11.0%)	311 (20.6%)	
Muchinga	191 (6.4%)	87 (5.8%)	105 (6.9%)	
Northern	248 (8.3%)	110 (7.4%)	138 (9.1%)	
North Western	186 (6.2%)	114 (7.6%)	72 (4.8%)	
Southern	327 (10.9%)	208 (14.0%)	119 (7.9%)	
Western	190 (6.3%)	136 (9.1%)	54 (3.6%)	
Exposure to radio				< 0.001
Yes	1293 (43.1%)	588 (39.5%)	705 (46.7%)	
No	1707 (56.9%)	902 (60.5%)	85 (53.3%)	
Exposure to TV				< 0.001
Yes	1293 (43.1%)	483 (32.4%)	810 (53.6%)	

Table 1 (continued)

Characteristics	All females N = 3000	Sexually active N = 1490 n (%)	Non-sexually active N = 1510 n (%)	p value
No	1707 (56.9%)	1007 (67.6%)	700 (46.4%)	
Reads newspapers				<0.001*
Yes	677 (22.6%)	258 (17.3%)	419 (27.7%)	
No	2323 (77.4%)	1232 (82.7%)	1091 (72.3%)	
Internet use				<0.001
Yes	316 (10.5%)	125 (8.4%)	191 (12.6%)	
No	2684 (89.5%)	1365 (91.6%)	1319 (87.4%)	

*Multiple logistic regression analysis shows that the following factors were independently associated with higher odds of being sexually active: 17–19 year age group (AOR: 6.48, 95% CI: 5.11–8.23, as compared with 15–16 year age group), being from household of less than 6 members (AOR: 1.46, 95% CI: 1.14–1.87, as compared with households of 6 or more members), being employed (AOR: 1.90, 95% CI: 1.45–2.48 as compared with non-employed) and lower income (poorest index; AOR: 2.65, 95% CI: 1.64–4.31, as compared with highest income group), non-exposure to newspapers (AOR: 1.60, 95% CI: 1.22–2.11, as compared with those with newspaper exposure) and Western province residence, as compared with all other provinces

nonuse of condom at last intercourse were not classified as engaging in this RSB.

Statistical Analysis

The study presented descriptive statistics on background characteristics and RSBs of the study sample. We examined the proportion of sexually active adolescent females and the factors associated with sexual activity and then examined the factors associated with RSB among sexually active female adolescents. Unadjusted logistic regression analyses were first conducted and those variables with a *p* value < 0.25 were included in the multiple logistic regression model (Bursac et al., 2008). Adjusted odds ratios (AOR), 95% confidence intervals (CI), and *p* values were calculated with statistical significance level being set at *p* value < 0.05. We used the SPSS analytic software version 25.0 complex samples package for analyses. The complex samples package incorporated the following variables in the analysis plan to account for the multistage sampling design inherent in the DHS dataset: individual sample weight, sample strata for sampling errors/design, and cluster number (Agbadi et al., 2020; Croft et al., 2018; Zou et al., 2019).

Results

Background characteristics of the adolescent female respondents are shown in Table 1. Slightly over half had less than secondary education and approximately one in seven was married. Nearly all respondents were Christians while Muslims and other religions comprised only 1%. The respondents were sampled from all provinces of Zambia and comparable to the

general population of Zambia with 55.9% residing in rural areas.

Nearly half (49.7%) were sexually active of whom 75.9% were not using any contraceptive methods. The sexually active and non-sexually active respondents were significantly different (*p* < 0.05) across all background characteristics except religion and sex of the household head (Table 1) in the unadjusted analysis. The multiple logistic regression analysis (Table 1 footnotes) revealed that besides being married, the factors independently associated with being sexually active were: older age, coming from households with less than six members, being employed, lower household wealth, without access to newspapers, and residing in the Western province.

The proportions of sexually active respondent that reported any of the five RSBs are shown in Table 2. Among sexually active respondents, 71.1% reported one or more RSBs. Notably, early sexual debut before 16 years of age was the most commonly reported RSB (50.6%). Nonuse of condoms at last intercourse was reported by 37.8%. Transactional sex, drinking alcohol at last intercourse and sex with multiple partners were much less commonly reported (1.9–6.2%). For RSB other than early sexual debut, the proportion who reported engaging in any of the other four RSB was 42.2%. About 4.6% engaged in both nonuse of condom and transactional sex, and 1.2% engaged in nonuse of condom and sex with multiple partners (untabulated).

Table 2 Risky sexual behaviors (RSB) prevalence among sexually active Zambian females (15–19 years of age)

Risk behavior	Prevalence of RSB (<i>n</i> = 1490) % (95% CI)
Sexual intercourse before age 16	50.6% (47.9–52.9)
Did not use a condom at last sex*	37.8% (35.1–39.9)
Had transactional sex	6.2% (4.6–7.4)
Alcohol consumption at last sexual intercourse	4.6% (3.8–6.0)
Engaged in sex with more than one partner	1.9% (1.3–2.7)
Any of the 5 risky sexual behaviors above	71.1% (68.8–73.4)

*Married respondents ≥ 18 years of age who did not use condoms at last intercourse were not classified as having engaged in this RSB

Factors Associated with RSB Among Sexually Active Adolescents

Table 3 presents the univariable and multiple logistic regression analysis of the factors that are associated with having engaged with any RSB among sexually active adolescent females. The multivariable analysis revealed that those who were younger had less than secondary education, were unmarried, had no access to Internet and resided in Western Zambia were significantly more likely to have engaged in RSB (AOR: 1.75–7.54).

Due to the high prevalence of early sexual debut in our study sample, we further examined the factors that were associated with having had sex before the age of 16 separately (Table 4). The factors that were independently associated with this RSB were low household wealth, working status, residing in Western province, no access to newspapers, being married, and with less than secondary education.

Discussion

This study aimed to provide long-needed information on RSBs among female adolescents in Zambia. RSB was reported in over two-thirds of sexually active respondents (corresponding to over one-third of the female adolescents) in this nationally representative sample. Early sexual debut before age 16 accounted for the largest proportion of RSBs. Owing to the methodological differences with studies conducted in other countries, we were only able to note that the proportions reporting sexual debut before age 16 were similar to those reported in Canada, Germany, France, and the Netherlands, but higher than many other countries in sub-Saharan Africa (Doyle et al., 2012; Nic Gabhainn et al., 2009).

The high prevalence of early sexual debut also increased the risk of engaging in other RSBs. Our study showed that there was a higher prevalence of RSBs among those with early sexual debut versus those with late sexual debut (nonuse of condom 37.9% vs. 12.3%, transactional sex: 7.4% vs. 1.6%, alcohol use: 4.1% vs. 1.7% and multiple partners: 2.0% vs.

0.6%). Overall, 42.2% of sexually active female adolescents engaged in one or more RSBs other than early sexual debut. However, the percentage were generally lower than many parts of sub-Saharan Africa. For instance, our study reported much lower prevalence of multiple sexual partners in the past year (decreasing from 3.5% in 2000 to 0.9% in 2018) (Kayeyi et al., 2013) as compared with Liberia (12%) (Doyle et al., 2012). These figures likely reflect the cumulative effects of government HIV programs that were launched in the past two decades. The Zambian government has been active with multi-sectoral HIV prevention programs that have been integrated into the development agenda (Kandala et al., 2011; Nakazwe et al., 2019).

In our study, however, being married was associated with early sexual debut which could be explained by the high cultural acceptance of child marriage in Zambia (World Vision, 2015; Zambia Statistics Agency, 2020). Zambia currently ranks among the top 20 countries for child marriage. In 2013, 1.8% of 15–19-year-old females were married by age 15, increasing to a rate of 2.2% in 2018 (World Vision, 2015; Zambia Statistics Agency, 2020). Teenage marriage is rooted in the gender norms that prioritize women's roles as wives and family caretakers; hence, marrying off teenage daughters is often seen as preferable to continued education. Additionally, the bride-price may be an important source of income (Sandoy et al., 2016), especially for poor families. Interestingly, though marriage was a risk factor for early sexual debut in our study, it was negatively associated with other four RSBs. On the other hand, Zambia's low age of consent for sexual intercourse (16 years) (SHRH Africa Trust, 2018) would also partly explain the high prevalence of early sexual debut.

Our study noted that other risk factors for RSB were low education and area of residence. Our study of Zambian sexually active female adolescents were similar to findings from other countries that also so showed lower education attainment was associated RSBs (Ajaero et al., 2020; Darteh et al., 2020; Fatusi & Blum, 2008; Girmay & Mariye, 2019; Kangmenang et al., 2019; Sandoy et al., 2007; Steinberg & Dornbusch, 1991). Also, a study of Zambian adolescents

Table 3 Correlates of engaging in risky sexual behaviors (RSB) among sexually active Zambian females (15–19 years of age) in 2018

	% RSB (<i>n</i> = 1490)	Univariable logistic regression model OR (95% CI)	Multiple logistic regression model AOR (95% CI)
Personal characteristics			
Age			
17–19 years	64.5%	1.00	1.00
15–16 years	95.3%	11.1 (5.88–20.0) [‡]	7.54 (4.10–13.88) [‡]
Education level			
At least some secondary	46.1%	1.00	1.00
Less than secondary	53.9%	1.51 (1.14–2.00) [†]	1.75 (1.23–2.50) [*]
Marital status			
Married	52.7%	1.00	1.00
Not married	78.7%	3.33 (2.50–4.35) [‡]	4.01 (2.78–5.78) [‡]
Working status			
Not working	71.8%	1.00	–
Working	68.8%	0.86 (0.62–1.20)	
Religion			
Muslim	100.0%	–	–
Others	61.5%		
Protestant	71.4%		
Catholic	69.9%		
Household attributes			
Household wealth index			
Richest quintile	65.1%	1.00	–
2nd quintile	70.0%	1.26 (0.75–2.09)	
3rd quintile	71.4%	1.35 (0.85–2.14)	
4th quintile	74.1%	1.54 (0.98–2.41)	
Poorest quintile	72.6%	1.42 (0.89–2.25)	
Household size			
6+ members	74.8%	1.00	1.00
5 or less members	65.1%	0.63 (0.47–0.84) [†]	1.05 (0.75–1.47)
Sex of household head			
Male	69.2%	1.00	1.00
Female	75.6%	1.39 (1.05–1.83) [*]	0.90 (0.65–1.25)
Residence classification			
Urban	67.6%	1.00	1.00
Rural	72.9%	1.29 (0.93–1.78)	1.13 (0.71–1.79)
Province of residence			
Lusaka	64.0%	1.00	1.00
Copperbelt	67.4%	1.17 (0.58–2.31)	0.96 (0.47–1.93)
Northern	71.2%	1.40 (0.78–2.52)	1.06 (0.54–2.09)
Muchinga	67.4%	1.16 (0.62–2.19)	1.08 (0.54–2.17)
Central	68.0%	1.18 (0.70–1.99)	0.97 (0.52–1.81)
Luapula	74.2%	1.61 (0.91–2.82)	1.12 (0.56–2.22)
Southern	74.0%	1.58 (0.89–2.81)	1.34 (0.54–3.34)
Eastern	65.6%	1.07 (0.62–1.83)	0.76 (0.40–1.46)
Northwestern	77.0%	1.85 (0.87–3.92)	1.58 (0.77–3.25)
Western	87.4%	3.80 (2.00–7.23) [†]	2.28 (1.08–4.82) [*]
Mass media exposure			
Reads newspapers			
Yes	66.7%	1.00	1.00
No	72.0%	1.28 (0.93–1.77)	1.13 (0.80–1.60)

Table 3 (continued)

	% RSB (<i>n</i> = 1490)	Univariable logistic regression model OR (95% CI)	Multiple logistic regression model AOR (95% CI)
Exposure to radio			
Yes	66.0%	1.00	1.00
No	74.4%	1.50 (1.13–1.98) [†]	1.31 (0.96–1.78)
Exposure to TV			
Yes	69.8%	1.00	–
No	71.8%	1.10 (0.82–1.49)	
Internet use			
Yes	55.2%	1.00	1.00
No	72.6%	2.16 (1.26–3.71) [†]	1.85 (1.04–3.28)*

**p* value < 0.05, [†]*p* value < 0.01 [‡]*p* value < 0.001, – not included as a variable in the multiple logistic regression model because *p* value > 0.25 in the univariable analysis religion not included in the sexually active sample logistic regression analysis due to very low numbers. Due to low numbers in tertiary and no education sub-categories of level of education, this variable was divided into pre (no education and primary) and secondary education and above (secondary and tertiary) secondary categories

by Chola et al. noted that higher levels of education was associated with increased in contraceptive use, particularly in urban areas (Chola et al., 2020). Low levels of education have been noted in a South African study to decrease adolescents' ability and confidence to discuss sexual matters with peers, parents, and sexual partners (Osuafor & Ayiga, 2016). In our study, those residing the Western province, a region characterized by difficult geographical and climatic conditions that negatively affect agricultural production, were more likely to engage in RSBs. Over 80% of the population in the Western province is classified as being poor (CSPR Zambia). Poor adolescents are more likely to drop out of school to work (Zambia Statistics Agency, 2020). Girls from low-income families have been noted to engage in transactional sex for economic subsistence (Ayele et al., 2018; Moore et al., 2007; Taaffe et al., 2016). Furthermore, the poverty reduces affordability of condoms which may predispose adolescents to RSB.

Lastly, lack of access to newspapers and lack of access to the Internet were associated with early sexual debut and other RSBs, respectively. Newspaper and Internet allows adolescents to have greater access to sex and reproductive health information which empowers them make informed decisions about their sexual behaviors (Ahinkorah et al., 2021; Thin Zaw et al., 2013). This is particularly true for adolescents living in rural area of Zambia where discussions about sexual health and sexuality are regarded as taboo (Menon et al., 2018). A study of 4922 rural school girls in the Southern and Central provinces of Zambia showed that only 35% of girls had communicated with their parents about romantic and/or sexual issues (Isaksen et al., 2020). Poverty in these areas unfortunately limits adolescents' access to media.

In our study, lower household wealth and working status were associated only with early sexual debut which might

reflect the higher likelihood of sexual activity in working adolescent girls. Poorer families often see early marriage as the viable option for girls, leading to low investment in education by parents (Petroni et al., 2017). Discontinuation of education due to the need to engage in remunerative work would also lead to long-term economic dependency, lower health literacy, limited decision making power, and reduced ability to negotiate for or practice safer reproductive health measures (Ayele et al., 2018). To tackle poverty among adolescent girls, the Zambian government, supported by international organizations, has implemented economic and financial empowerment projects, including the impactful GEWEL Project (Girl's Education and Women Empowerment and Livelihood). A multi-million dollar grant from World Bank aims to support the government of the Republic of Zambia to increase access to livelihood support for women in rural areas. Additionally, the Women Economic Empowerment Programme (WEEP) is another initiative designed to harmonize the design, development, programming and implementation of economic empowerment targeting vulnerable youths and women across Zambia as the basis for job and wealth creation in both urban and rural areas.

Strengths and Limitations

Although this study used nationally representative data, the RSB prevalence in our study might be underestimated due to nonresponse to some RSB questions including missing data on transactional sex in 694 adolescents. The self-report responses might also be prone to social desirability bias, particularly in the questions regarding multiple sex partners. Also, the RSB was operationalized in this study as having engaged in any one of several sexual behaviors that vary significantly in risk for adverse health outcomes (e.g.,

Table 4 Correlates of early sexual debut among Zambian females (15–19 years of age) in 2018 ($n = 3000$)

	All females Univariable OR (95% CI)	All females Multiple logistic regression model AOR (95% CI)
Personal characteristics		
Age		
15–16	1.00	1.00
17–19	1.13 (0.92–1.39)	0.98 (0.77–1.24)
Education level		
Secondary/tertiary	1.00	1.00
Primary education	2.27 (1.83–2.80) [‡]	1.55 (1.19–2.01) [‡]
No education	3.49 (2.41–5.07) [‡]	2.08 (1.30–3.33) [†]
Marital status		
Not married	1.00	1.00
Married	3.71 (2.88–4.77) [‡]	2.46 (1.81–3.35) [‡]
Working status		
Not working	1.00	1.00
Working	2.14 (1.64–2.79) [‡]	1.41 (1.05–1.90) [*]
Religion		
Muslim	1.00	–
Others	0.41 (0.05–3.16)	
Protestant	0.64 (0.11–3.72)	
Catholic	0.56 (0.10–3.31)	
Household attributes		
Household wealth index		
Richest quintile	1.00	1.00
2nd quintile	2.86 (1.93–4.26) [‡]	2.04 (1.35–3.08) [†]
3rd quintile	3.92 (2.75–5.60) [‡]	1.83 (1.16–2.90) [*]
4th quintile	4.91 (3.44–7.00) [‡]	1.78 (1.09–2.91) [*]
Poorest quintile	5.51 (3.86–7.88) [‡]	1.54 (1.01–2.55) [*]
Household size		
6+ members	1.00	1.00
5 or less members	1.41 (1.15–1.73) [†]	1.10 (0.87–1.39)
Sex of household head		
Male	1.00	–
Female	1.07 (0.83–1.37)	
Residence classification		
Urban	1.00	1.00
Rural	2.54 (2.03–3.18) [‡]	1.19 (0.91–1.56)
Province of residence		
Lusaka	1.00	1.00
Copperbelt	0.97 (0.59–1.62)	0.90 (0.55–1.48)
Northern	2.00 (1.27–3.14) [†]	1.12 (0.69–1.82)
Muchinga	1.94 (1.25–3.00) [†]	1.01 (0.62–1.63)
Central	2.08 (1.29–3.34) [†]	1.36 (0.82–2.27)
Luapula	2.35 (1.54–3.58) [‡]	1.30 (0.82–2.05)
Southern	3.05 (1.94–4.78) [‡]	1.67 (1.03–2.72) [*]
Eastern	2.98 (1.87–4.74) [‡]	1.47 (0.88–2.45)
North Western	3.36 (2.21–5.10) [‡]	2.16 (1.33–3.51) [†]
Western	6.16 (3.91–9.70) [‡]	4.31 (2.60–7.12) [‡]

Table 4 (continued)

	All females Univariable OR (95% CI)	All females Multiple logistic regression model AOR (95% CI)
Mass media exposure		
Reads newspapers		
Yes	1.00	1.00
No	2.05 (1.57–2.67) [‡]	1.35 (1.01–1.83) [*]
Exposure to radio		
Yes	1.00	1.00
No	1.47 (1.19–1.83) [‡]	0.98 (0.76–1.28)
Exposure to TV		
Yes	1.00	1.00
No	2.45 (1.93–3.11) [‡]	1.06 (0.78–1.43)
Internet use		
Yes	1.00	1.00
No	2.94 (1.95–4.44)	1.19 (0.75–1.87)

* p value < 0.05, [†] p value < 0.01, [‡] p value < 0.001, – not included as a variable in the multiple logistic regression model because p value > 0.25 in the univariable analysis

transactional sex poses greater risk than drinking alcohol before sexual intercourse). Lastly, the cross-sectional data precludes causal associations to be drawn between RSB and various factors. Nonetheless, this analysis used the most current and nationally representative data that should increase generalizability of the findings to all female adolescents in Zambia.

Conclusion and Recommendations

This study showed that over 70% of the sexually active female adolescents are at high risk of adverse reproductive health outcomes. Despite the known negative consequences of RSBs, economic constraints and sociocultural norms that hinder gender equality, and limited access to sexual and reproductive health information have remained key barriers in reducing RSBs. Given the high level of interconnectedness of the various risk factors for RSBs and the increasing trend of young age of sexual debut that has life course effects in terms of pregnancy and cessation of education, tackling adolescent RSBs in Zambia requires engagement of multiple stakeholders. Strategies targeting this age group must therefore include a multi-prong intervention to improve economic circumstances, increase health education and health service utilization as well as family-based support to discourage early marriage. There is a need for more adolescent health programs targeting early sexual debut and need to explore the reasons for the persistent and increasing high early sexual debut in Zambia. These interventions should be targeted to

low socioeconomic status adolescents, especially those residing in the Western province.

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Author's Contribution QS was the principal investigator on the project, conceptualized the study, designed the analysis, conducted the analysis and wrote the first draft of the paper. DM, PP and JHK participated in the design of the study, conducted the literature review, reviewed the first draft and participated in the write up of the subsequent versions of the manuscript to the final manuscript.

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Availability of Data and Materials (Data Transparency) The data set used is openly available upon permission from MEASURE DHS website (USAID).

Code Availability These can be availed after getting permission from MEASURE DHS.

Declarations

Conflict of interest The authors have no relevant financial or non-financial interests to disclose.

Ethical Approval High international ethical standards are ensured for MEASURE DHS surveys as ethical approval from the country is obtained from a national ethical review board and local authorities before implementing the survey and well-informed verbal consent is sought from the respondents prior to data collection. For the 2018 ZDHS, ethical approval was obtained from the Inner City Fund (ICF) and the Zambia Tropical Diseases Research Centre (TDRC), institutional review boards (IRBs) (Zambia Statistics Agency, 2020). All methods of data collection were performed in accordance with the relevant guidelines and regulations (Zambia Statistics Agency, 2020).

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