Does Having Comprehensive HIV and AIDS Knowledge Affect the Risky Sexual Behaviour of Young People in Sub – Saharan Africa: Pooled Analysis of Demographic and Health Surveys

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Keywords: Risky sexual behaviour, Young people, Comprehensive HIV and AIDS knowledge

Posted Date: February 12th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-197456/v1>

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Abstract

Background: Risky sexual behaviours (RSB) include all those behaviours such as multiple sexual unions, inconsistent use of condoms, or having sex under the influence of stimulants which have a greater propensity to exacerbate an individual's vulnerability to unintended pregnancies and sexually transmitted infections including HIV/AIDS. This study explores the relationship between comprehensive knowledge on HIV and RSB among young people in sub-Saharan Africa (SSA).

Methods: Data for this study were obtained from the current Demographic and Health Surveys (DHS) conducted between 2010 and 2018 in 28 SSA countries. These countries were chosen because they had complete information on the variables of interest for both males and females. Both descriptive and inferential analyses were conducted.

Results: It was found that 54.4% of young women and 40.0% of young men engaged in RSB. This ranged from 16.1% in Lesotho to 91.6% in Sierra Leone among young women and 17.1% in Namibia to 80.5% in Sierra Leone among young men. We also found that young men [AOR=0.78, CI=0.73–0.84] and women [AOR=0.92, CI=0.87–0.98] who had comprehensive HIV and AIDS knowledge had lower odds of engaging in RSB compared to those who did not have comprehensive HIV and AIDS knowledge.

Conclusion: The study showed a low level of comprehensive knowledge on HIV/AIDS in SSA and a gap in the proportion of young males and females regarding comprehensive knowledge on HIV/AIDS. Risky sexual behaviour varied by sex. This reflected in a higher proportion of young females (54.5%) indulging in RSB as compared to young males (40.0%). Our findings also revealed that comprehensive knowledge of HIV/AIDS influences risky sexual behaviour of young people. Age, level of education, place of residence, wealth status, exposure to radio, television, and newspaper or magazine have a significant relationship with RSB. These findings infer the need for targeted messages and interventions for the various categories of young people in SSA with relevant information on comprehensive knowledge of HIV/AIDS.

Background

Generally, sexual behaviours can be seen from two dimensions: the dimension of protective sexual behaviour or risky sexual behaviour [1]. The former denotes those behaviours (i.e., consistent use of condom, abstinence and sexual fidelity) that shield an individual from sexually transmitted infections and unplanned pregnancies. This, in effect, makes risky sexual behaviours (RSB) to include all those behaviours such as multiple sexual unions, non-use or inconsistent use of condoms or having sex under the influence of stimulants which have a greater propensity to exacerbate an individual's vulnerability to unintended pregnancies and sexually transmitted infections including HIV/AIDS [2]. Thus, young people who engage in unprotected sex, as well as multiple sexual partnerships, are more likely to be at a higher risk gradient of the sexual behaviour continuum [1].

It is important to note that RSB among young people varies with the sex [3]. On one hand, males are more probable to engage in multiple sexual partnerships [4] on the other hand, females are more likely to engage in early sexual debut [5]. RSB continues to significantly differ by the educational level of the individual as well as their wealth quintile [6]. Given the multiplicity of factors influencing RSB, it poses a threat to the achievement of the 90-90-90 agenda for HIV [7], particularly for sub-Saharan Africa (SSA).

Evidence shows that the global prevalence of HIV stands at 35 million with 71% of those infected living within SSA [8] and about 1.8 million being young people aged 10–19 [9]. This high prevalence of HIV within the SSA region can partly be attributed to the RSBs of young people within the region, which is reinforced by insufficient or lack of comprehensive knowledge about HIV [10]. In this context, comprehensive knowledge on HIV encapsulates the knowledge that consistent use of condoms during sexual intercourse and having just one uninfected faithful partner can reduce the chances of getting HIV/AIDS virus, knowing that a healthy-looking person can have the HIV/AIDS virus, and rejecting the two most common local misconceptions about HIV/AIDS transmission or prevention (thus, mosquito bites can give HIV and HIV can be gotten from witchcraft and supernatural means) [11–13]. The absence of such knowledge exacerbates and reinforces RSB among young people.

Despite the potential of comprehensive knowledge on HIV to explain RSBs among young people in SSA, there is a paucity of empirical studies on the subject. Empirically, there haven't been studies that explored the role of comprehensive knowledge on HIV in explaining RSBs among young people in SSA, thereby presenting a significant gap in the literature for which the study seeks to fill. The present study draws on an analysis of DHS data of 28 countries within the sub-region to explore comprehensive knowledge on HIV and RSB among young people. The findings of this study can inform appropriate, research-based policies that will facilitate targeted messages and interventions for the various categories of young people in SSA with relevant information on comprehensive knowledge of HIV/AIDS.

Methods

Data source

Data for this study were obtained from the current Demographic and Health Surveys (DHS) conducted between January 1, 2010, and December 31, 2018, in 28 SSA countries. These countries were chosen because they had complete information on the variables of interest for both young males and females. DHS is a nationwide survey that is carried out across low and middle-income countries every five-years [14]. The survey is representative of each of these countries and focuses on key health indicators. For this study, women's files (IR) and males (MR) files were used, and these files contain the responses of women aged 15–49 and men aged 15–59 respectively. Details of the sampling approach have been described in previous studies [14, 15]. In this study, the sample size consisted of young women (22,350) and young men (16,810) aged 15–24 who had complete information on all the variables of interest and had ever had sexual intercourse. We relied on the Strengthening the Reporting of Observational Studies in Epidemiology' (STROBE) statement in conducting this study and writing the manuscript.

Variables

Outcome variable

The outcome variable employed for this study was risky sexual behaviour. This was derived from 'the number of other sexual partners' and 'condom used during last sex with the most recent partner' [16–18]. The number of other sexual partners' variable was originally coded as 1 = "1 or more" and 0 = "0" and condom use during last sex with most recent partner variable was coded 1 = 1 "no" and 0 = 0 "yes". These were recoded as 1 = "Risky" and 0 = "Not risky". An index was created with all the "risky" and "not risky" answers with scores ranging from 0 to 2. The score 0 1 was labelled as "not risky" and 2 was labelled as "risky". A dummy variable was generated with '0 and 1' score being young people who either used a condom during last sex with a most recent partner and had zero other sexual partner and '2' young people who had 1 or more other sexual partners and did not use a condom during their last sex with a most recent partner [17].

Independent variable

The independent variable used was comprehensive HIV and AIDS knowledge. It was defined as knowing that consistent use of condoms during sexual intercourse and having just one uninfected faithful partner can reduce the chance of getting AIDS virus; knowing that a healthy-looking person can have the AIDS virus; and rejecting the two most common misconceptions about AIDS transmission or prevention (thus, mosquito bites can give HIV and HIV can be gotten from witchcraft and supernatural means) [11–13]. Young people who knew that consistent use of condoms during sexual intercourse and having just one uninfected faithful partner can reduce the chance of getting AIDS virus, those who knew that a healthy-looking person can have the AIDS virus and those who rejected the two most common misconceptions about AIDS transmission or prevention were considered as having comprehensive HIV/AIDS knowledge and were given the code "1 = Yes". Those who did not know that consistent use of condoms during sexual intercourse and having just one uninfected faithful partner can reduce the chance of getting AIDS virus, a healthy-looking person can have the AIDS virus and did not reject the two most common misconceptions about AIDS transmission or prevention were considered as not having comprehensive HIV/AIDS knowledge and were given the code "0 = No".

Control variables

Apart from the main predictor variable (Comprehensive HIV and AIDS knowledge), eight control variables were considered in our study essentially due to their statistically significant relationship with RSB in erstwhile studies [16–18]. These variables were age (15–19, 20–24), wealth index (poorest, poor, middle, richer, richest), educational level (no education, primary, secondary, higher), place of residence (rural, urban), and mass media exposure (Television, Newspaper, and Radio) [not at all, less than once a week, at least once a week, almost once a week] (see Table 1).

Statistical analyses

Both descriptive and inferential analyses were conducted. The descriptive analysis involving the use of frequencies and percentages were used to describe the sample and also to portray the prevalence of risky sexual behaviour for each of the countries and the overall prevalence for all the countries for both males and females. Afterwards, a binary logistic regression model was used to assess the factors associated with RSB. Three models were fitted for both males and females. The model I contained comprehensive HIV and AIDS knowledge and its association with RSB. The second model controlled for the covariates and the final model was the complete model that controlled for the survey country. The results from the regression analysis were reported as odds ratios (ORs) and adjusted odds ratios (AORs) with their corresponding 95% confidence intervals (CIs). Statistical significance was pegged at $p < 0.05$. The choice of the reference categories was informed by previous studies and a priori. To check for correlation among the explanatory variables, a test for multicollinearity was done using the variance inflation factor (VIF) and the results showed no evidence of high collinearity among the explanatory variables for both males (mean VIF = 2.37) and females (mean VIF = 2.23). Sample weight (v005/1,000,000) was applied to correct for over and under-sampling while the SVY command was used to account for the complex survey design and generalizability of the findings. We conducted a different analysis for the sexes because the DHS data barely permits for amalgamation of the males and females recode files– the unique identification codes for merging male and female data files can conflict which can lead to loss of data [19]. All analyses were done with STATA version 14.2.

Ethical Approval

Ethical permissions are not required for this study since we used DHS datasets already publicly available. Institutions that commissioned, funded, or managed the surveys were responsible for ethical procedures. ICF international as well as an Institutional Review Board (IRB) in the respective country approved all the DHS surveys to ensure that the protocols comply with the U.S. Department of Health and Human Services regulations for the protection of human subjects. Data is available on <https://dhsprogram.com/data/available-datasets.cfm>.

Results

Background characteristics of respondents

Table 1 shows the background characteristics of young people. It was found that 57.3% and 44% of females and males respectively who were aged 15-19 engaged in risky sexual behaviours. With the place of residence, the majority of the young people were in urban areas (52.7% females, 59.4% males) were engaged in risky sexual behaviours. A greater proportion of the young people who had secondary education (58.6% females, 56.1% males) were engaged in risky sexual behaviours. The results further revealed that 28.7% and 23.4% of young women and young men respectively within the richest wealth

quintile were engaged in risky sexual behaviours. In terms of exposure to mass media, 45.0% of young women and 42,4% of young men do not watch television at all were engaged in risky sexual behaviours. Similarly, 64.2% and 68.9% of young women and men respectively who do not read newspapers engaged in risky sexual behaviours. Finally, 56.6% of young women and 49.7% of young men who do not have comprehensive HIV and AIDS knowledge engaged in risky sexual behaviours (see Table 1).

Table 1
Background characteristics of respondents and risky sexual behaviour

Variable	Females		Males	
	Frequency N = 22,350	Proportion of risky sexual behaviour	Frequency N = 16,810	Proportion of risky sexual behaviour
Age				
15–19	11,065	52.1	7,108	46.2
20–24	11,235	47.9	9,702	53.8
Place of residence				
Urban	12,462	52.7	8,488	59.4
Rural	9,888	47.3	8,322	40.6
Level of education				
No education	1,386	7.9	781	7.9
Primary	5,554	27.0	4,305	30.7
Secondary	13,463	58.6	10,286	56.1
Higher	1,947	6.5	1,438	5.3
Wealth status				
Poorest	2,433	12.1	1,877	15.5
Poorer	3,182	15.7	2,554	17.6
Middle	4,085	19.7	3,248	20.9
Richer	5,381	23.8	3,996	22.6
Richest	7,269	28.7	5,135	23.4
Frequency of watching television				
Not at all	9,040	45.0	5,236	42.4
Less than once a week	3,616	16.9	3,360	19.0
At least once a week	7,441	30.9	6,874	34.0
Almost once a week	2,253	7.2	1,340	4.6
Frequency of reading newspaper or magazine				

Variable	Females		Males	
Not at all	13,878	68.9	9,341	64.2
Less than once a week	4,323	16.2	3,722	17.7
At least once a week	3,873	14.1	3,607	17.8
Almost once a week	276	0.9	140	0.3
Frequency of listening to radio				
Not at all	7,070	32.8	3,474	23.0
Less than once a week	5,262	24.6	3,449	20.5
At least once a week	9,303	40.0	9,291	54.6
Almost once a week	715	2.6	596	1.9
Comprehensive knowledge of HIV and AIDS				
No	11,796	56.6	8,495	49.7
Yes	10,554	43.4	8,315	50.3

Prevalence of RSB among young men and women in SSA

In Fig. 1, the prevalence of RSB among young men and women in SSA is presented. It was found that 54.4% of young women and 40.0% of young men were engaged in RSB. This ranged from 16.1% in Lesotho to 91.6% in Sierra Leone among young women. With young men, it ranged from 17.1% in Namibia to 80.5% in Sierra Leone (see Fig. 1).

Logistic regression analysis results on RSB among young men and women in SSA

Table 2 shows the logistic regression analysis results on RSB among young women in SSA. It was found that young women from Sierra Leone [AOR=5.66, CI=4.41–7.27], Mali [AOR=1.99, CI=1.42 – 2.79] and Liberia [AOR=1.40, CI=1.11 – 1.77] had higher odds of engaging in RSB while young women from Lesotho [AOR=0.10, CI=0.07 – 0.13] had the lowest odds of engaging in RSB compared with those from Benin. The study also showed that young women who have comprehensive HIV and AIDS knowledge [AOR=0.92, CI=0.87–0.98] had lower odds of engaging in RSB compared to those who do not have comprehensive HIV and AIDS knowledge. It was also found that young women in the richest [AOR=0.74, CI=0.65 – 0.84], and richer [AOR=0.88, CI=0.79 – 0.99] wealth quintile, those with a higher level of

education [AOR=0.74, CI=0.62– 0.88], those who listen to radio at least once a week [AOR=0.88, CI=0.82 – 0.96], less than once a week [AOR=0.88, CI=0.82 – 0.96] and those who watch television less than once a week [AOR=0.74, CI=0.65 – 0.84] and at least once a week [AOR= 0.86, CI=0.79 – 0.94] had lower odds of engaging in RSB compared to those in the poorest wealth quintile, those with no formal education and those who do not listen to radio nor watch television at all respectively.

Table 3 shows the logistic regression analysis results on RSB among young males in SSA. It was found that young men in Sierra Leone [AOR=2.53, CI=1.98–3.23] and Congo DR [AOR=1.45, CI=1.16 – 1.82] had higher odds of engaging in RSB compared with those from Benin, with those from Lesotho having lower odds [AOR=0.09, CI=0.07 – 0.12]. We also found that young men who have comprehensive HIV and AIDS knowledge had lower odds [AOR=0.78, CI=0.73–0.84] of engaging in RSB compared to those who do not have comprehensive HIV and AIDS knowledge. It was also found that young men aged 20-24 [AOR=0.86, CI=0.80 – 0.92], those in the richest [AOR=0.51, CI=0.44–0.59] and richer wealth quintile [AOR=0.69, CI=0.61–0.78], those with primary [AOR=0.83, CI=0.70 – 0.99], secondary [AOR=0.57, CI=0.48 – 0.69], and a higher level of education [AOR=0.44, CI=0.35–0.55], those who listen to radio at almost once a week [AOR=0.62, CI=0.36 – 1.06], those who read the newspaper almost once a week [AOR=0.78, CI=0.61–0.99] and those who watch television at least once a week [AOR=0.74, CI=0.67 – 0.82] had lower odds of engaging in RSB compared to those aged 14-19, those with no formal education, those in the poorest wealth quintile, those who do not listen to radio, read newspaper nor watch television at all respectively. Nonetheless, young men in rural areas [AOR=1.25, CI=1.14 – 1.37] had higher odds of engaging in RSB compared with those in urban areas.

Table 2
Logistic regression analysis on Risky sexual behaviour among young females in SSA

Variable	Model 1 OR[95%CI]	Model 2 AOR[95%CI]	Model 3 AOR[95%CI]
Comprehensive knowledge of HIV and AIDS			
No	Ref	Ref	Ref
Yes	0.73*** (0.69–0.77)	0.79*** (0.75–0.84)	0.92** (0.87–0.98)
Age			
15–19		Ref	Ref
20–24		0.86*** (0.82–0.92)	0.98 (0.92–1.04)
Place of residence			
Urban		Ref	Ref
Rural		0.89** (0.83–0.95)	1.13** (1.05–1.21)
Level of education			
No education		Ref	Ref
Primary		0.67*** (0.60–0.77)	1.17* (1.02–1.34)
Secondary		0.74*** (0.66–0.84)	0.91 (0.79–1.04)
Higher		0.62*** (0.53–0.73)	0.74** (0.62–0.88)
Wealth status			
Poorest		Ref	Ref
Poorer		0.96 (0.87–1.06)	0.96 (0.86–1.07)
Middle		0.97 (0.88–1.07)	0.95 (0.85–1.06)
Richer		0.91 (0.82–1.01)	0.88* (0.79–0.99)
Richest		0.72*** (0.65–0.81)	0.74*** (0.65–0.84)
Frequency of watching television			
Not at all		Ref	Ref
Less than once a week		0.91* (0.84–0.99)	0.99 (0.90–1.08)
At least once a week		0.80*** (0.74–0.86)	0.86** (0.79–0.94)
*p < 0.05 **p < 0.01 ***p < 0.001, Ref = Reference Category			
OR = Odds Ratio, AOR = Adjusted Odds Ratios			

Variable	Model 1 OR[95%CI]	Model 2 AOR[95%CI]	Model 3 AOR[95%CI]
Almost once a week		0.45*** (0.40–0.51)	0.74*** (0.65–0.84)
Frequency of reading newspaper or magazine			
Not at all		Ref	Ref
Less than once a week		0.67*** (0.62–0.72)	0.88** (0.82–0.96)
At least once a week		0.66*** (0.61–0.72)	0.83*** (0.75–0.90)
Almost once a week		0.67** (0.50–0.90)	0.86 (0.64–1.15)
Frequency of listening to radio			
Not at all		Ref	Ref
Less than once a week		1.16*** (1.08–1.26)	0.94 (0.86–1.02)
At least once a week		1.08* (1.01–1.15)	0.95 (0.88–1.03)
Almost once a week		0.95 (0.79–1.14)	0.92 (0.77–1.11)
Survey country			
Benin			Ref
Burundi			0.35*** (0.26–0.45)
Cameroon			0.32*** (0.25–0.42)
Chad			0.35*** (0.22–0.57)
Comoros			0.58* (0.35–0.96)
Congo			0.57 *** (0.45–0.71)
Congo DR			0.98 (0.79–1.22)
Cote d’voire			0.52*** (0.42–0.65)
Ethiopia			0.38*** (0.28–0.51)
Gabon			0.32*** (0.25–0.42)
Ghana			1.25 (0.98–1.60)
Gambia			0.58** (0.39–0.87)
Guinea			0.98 (0.75–1.30)
*p < 0.05 **p < 0.01 ***p < 0.001, Ref = Reference Category			
OR = Odds Ratio, AOR = Adjusted Odds Ratios			

Variable	Model 1 OR[95%CI]	Model 2 AOR[95%CI]	Model 3 AOR[95%CI]
Kenya			0.31*** (0.25–0.40)
Lesotho			0.10*** (0.07–0.13)
Liberia			1.40** (1.11–1.77)
Malawi			0.20*** (0.16–0.24)
Mali			1.99*** (1.42–2.79)
Mozambique			0.41*** (0.33–0.51)
Namibia			0.23*** (0.19–0.29)
Niger			0.15*** (0.08–0.31)
Nigeria			0.68*** (0.55–0.84)
Rwanda			0.26*** (0.20–0.33)
Sierra Leone			5.66*** (4.41–7.27)
Senegal			0.33*** (0.22–0.58)
Togo			0.42*** (0.33–0.54)
Uganda			0.40*** (0.32–0.50)
Zimbabwe			0.42*** (0.33–0.54)
*p < 0.05 **p < 0.01 ***p < 0.001, Ref = Reference Category			
OR = Odds Ratio, AOR = Adjusted Odds Ratios			

Table 3
Logistic regression analysis results on Risky sexual behaviour among young males in SSA

Variable	Model 1 OR[95%CI]	Model 2 AOR[95%CI]	Model 3 AOR[95%CI]
Comprehensive knowledge of HIV and AIDS			
No	Ref	Ref	Ref
Yes	0.58*** (0.54–0.61)	0.66*** (0.61–0.71)	0.78*** (0.73–0.84)
Age			
15–19		Ref	Ref
20–24		0.84*** (0.78–0.89)	0.86*** (0.80–0.92)
Place of residence			
Urban		Ref	Ref
Rural		1.01 (0.93–1.10)	1.25*** (1.14–1.37)
Level of education			
No education		Ref	Ref
Primary		0.50*** (0.42–0.59)	0.83* (0.70–0.99)
Secondary		0.51*** (0.43–0.60)	0.57*** (0.48–0.69)
Higher		0.36*** (0.29–0.45)	0.44*** (0.35–0.55)
Wealth status			
Poorest		Ref	Ref
Poorer		0.84** (0.75–0.95)	0.85** (0.76–0.96)
Middle		0.76*** (0.68–0.85)	0.74*** (0.66–0.84)
Richer		0.74*** (0.66–0.83)	0.69*** (0.61–0.78)
Richest		0.62*** (0.55–0.71)	0.51*** (0.44–0.59)
Frequency of watching television			
Not at all		Ref	Ref
Less than once a week		0.62*** (0.57–0.69)	0.78*** (0.71–0.87)
At least once a week		0.55*** (0.51–0.61)	0.74*** (0.67–0.82)

*p < 0.05 **p < 0.01 ***p < 0.001, Ref = Reference Category, OR = Odds Ratio, AOR = Adjusted Odds Ratios

Variable	Model 1 OR[95%CI]	Model 2 AOR[95%CI]	Model 3 AOR[95%CI]
Almost once a week		0.35*** (0.30–0.42)	0.78* (0.61–0.99)
Frequency of reading newspaper or magazine			
Not at all		Ref	Ref
Less than once a week		0.73*** (0.67–0.80)	0.85** (0.77–0.95)
At least once a week		0.82*** (0.75–0.90)	0.91 (0.82–1.00)
Almost once a week		0.55* (0.32–0.94)	0.78* (0.61–0.99)
Frequency of listening to radio			
Not at all		Ref	Ref
Less than once a week		0.88** (0.79–0.97)	0.79*** (0.72–0.87)
At least once a week		0.95 (0.87–1.04)	0.81*** (0.73–0.90)
Almost once a week		0.73** (0.58–0.91)	0.62 (0.36–1.06)
Survey country			
Benin			Ref
Burundi			0.34*** (0.24–0.48)
Cameroon			0.27*** (0.21–0.35)
Chad			0.81 (0.59–1.13)
Comoros			0.38*** (0.27–0.53)
Congo			0.41*** (0.33–0.51)
Congo DR			1.45** (1.16–1.82)
Cote d’voire			0.29*** (0.23–0.37)
Ethiopia			0.40*** (0.31–0.52)
Gabon			0.21*** (0.16–0.28)
Ghana			0.75* (0.57–0.98)
Gambia			0.46*** (0.34–0.63)
Guinea			0.47*** (0.35–0.62)

*p < 0.05 **p < 0.01 ***p < 0.001, Ref = Reference Category, OR = Odds Ratio, AOR = Adjusted Odds Ratios

Variable	Model 1 OR[95%CI]	Model 2 AOR[95%CI]	Model 3 AOR[95%CI]
Kenya			0.17*** (0.14–0.21)
Lesotho			0.09*** (0.07–0.12)
Liberia			0.72** (0.56–0.92)
Malawi			0.14*** (0.11–0.17)
Mali			0.80 (0.59–1.09)
Mozambique			0.53*** (0.42–0.67)
Namibia			0.11*** (0.09–0.15)
Niger			0.36** (0.19–0.66)
Nigeria			0.38*** (0.29–0.48)
Rwanda			0.21*** (0.15–0.30)
Sierra Leone			2.53*** (1.98–3.23)
Senegal			0.21*** (0.14–0.31)
Togo			0.25*** (0.19–0.33)
Uganda			0.35*** (0.27–0.44)
Zimbabwe			0.13*** (0.10–0.16)
*p < 0.05 **p < 0.01 ***p < 0.001, Ref = Reference Category, OR = Odds Ratio, AOR = Adjusted Odds Ratios			

Discussion

This present study explored the relationship between comprehensive knowledge on HIV/AIDS and RSB among young people in SSA. We found that a higher proportion of young people do not have comprehensive knowledge of HIV/AIDS. Similarly, [13] and [20] also found that comprehensive knowledge of HIV/AIDS was low among young people. We also observed a gender differential in the proportion of comprehensive knowledge on HIV/AIDS. Specifically, a higher proportion of young males appeared to have comprehensive knowledge of HIV/AIDS than their female counterparts. This corroborates the findings of [13] who also observed that female youth are less likely to have comprehensive knowledge of HIV than their male counterparts.

We also realized that young people with comprehensive knowledge of HIV/AIDS had a lower likelihood of engaging in RSB. This is consistent with previous studies [see 11, 21-26]. This could be attributed to the fact that comprehensive knowledge of HIV/AIDS equips young people with essential information in

decision making regarding their sexual behaviours. There is, therefore, a need for pragmatic steps to be taken for interventions targeted at young females to help increase their awareness and knowledge on HIV/AIDS.

Whereas 54 out of 100 young females indulge in RSB, 40 out of 100 young males indulge in RSB. With a range of 17.1% (Lesotho) and 91.6% (Sierra Leone) among young women while that of young men was 16.1% (Namibia) and 80.5% (Sierra Leone) in SSA. This could be attributed to the fact that the proportion of males knowing about comprehensive HIV/AIDS is higher than that of their female counterparts [13]. This could also be attributed to the fact that the proportion of females with no formal education in the current study far outweighs that of their male counterparts. Education has been shown to be a key factor in a comprehensive knowledge of HIV/AIDS [11]. This finding, however, contradicts that of [27] who argued that male youth indulge more in RSB than female youth. Nonetheless, the high prevalence of RSB recorded could be as a result of societal norms in various SSA countries which encourages RSB. For instance, in Kenya and Ghana, having multiple sexual partners is accepted especially among men [17].

Young women from Sierra Leone, Mali and Liberia were more likely to engage in RSB than their counterparts from Lesotho and Benin. This could be attributed to early initiation of sex among females in some parts of Africa like Sierra Leone, Mali and Liberia due to early marriages or possibly due to females having older sexual partners [28]. This results in a shift in the power dynamic in a sexual relationship and as such young women being unable to negotiate for safe sex. This corroborates the argument of [29] that women are the most vulnerable group to not using condoms due to forced sex/sexual violence or resistance of their sex partner. Similarly, young men from Sierra Leone and Congo are more likely to indulge in RSB as compared to their counterparts from Lesotho and Benin. A possible explanation is a higher level of curiosity to indulge in sex among males from Sierra Leone and Congo. It could also be a result of having multiple sexual partners as opined by [17].

We realized that a high proportion of young people aged 15-19 years indulge in RSB as compared to those aged 20-24 years. We also observed that RSB was highest among young people with no formal education (69% females, 64.4% males). However, the proportion of young people that engaged in RSB decreases as the level of education goes higher. This finding could be attributed to the fact that as the level of education of an individual increase, one is expected to have a higher exposure to comprehensive sexual education, hence less engagement in RSB [11,25].

With regards to the place of residence, most of the young people who engaged in RSB were in rural areas (58.2 % females, 46.6% males) as compared to their counterparts living in the urban areas (51.5% females, 33.5% males). This was also confirmed by our regression analysis. Similar results were found in studies conducted by [22, 23] who explained that urban residents were more likely to have higher comprehensive knowledge of HIV/AIDS compared to those living in rural areas and as such, engages less in risky sexual behaviours. One reason for the rural-urban variation in RSB could be that, in urban areas,

there is a higher level of formal education compared to rural areas which often translates to a good occupation, income and access to information such as the importance of using a condom [11, 12, 28].

Our study also found that young women in the richest and Richer wealth quintile, those with a higher level of education were less likely of engaging in RSB compared to their counterparts in the poorest wealth quintile and those with no formal education. Similarly, young men aged 20-24, those with primary, secondary, and a higher level of education, those in the richest and richer wealth quintile were less likely to indulge in RSB as compared to their counterparts who are aged 14-19, those with no formal education, and those in the poorest wealth quintile. With regards to wealth, our finding is rather contradictory to what was found in studies conducted by [30, 31, 32]. However, our findings on education affirm that of [11] who argued that comprehensive HIV/AIDS knowledge has a significant relationship with an increasing level of education. Our findings on education also coincide with studies done in Botswana [33], Ethiopia [11], and Ghana [34].

Young people who listened to radio at least once a week, less than once a week and those who watch television less than once a week, and at least once a week had a lower likelihood of engaging in RSB as compared to their counterparts who do not listen to radio nor watch television at all. This affirms the findings of [24] and [26] who are of the view that young women who listen to radio or watch television are more likely to have information on HIV/AIDS than those who do not.

Strength and limitations

The strength of our findings is rooted in the sample size of 22,350 females and 16,810 males yielding comparable samples across 28 countries. Nonetheless, there are several limitations to this research worth noting. DHS data are based on self-report and the survey methodology did not allow for the measurement of actual behaviour. Thus, given the possibility of social desirability bias, these data may not be entirely accurate representations of risky sexual behaviour.

Conclusion

The study showed a low level of comprehensive knowledge on HIV/AIDS in SSA and a gap in the proportion of young males and females regarding comprehensive knowledge on HIV/AIDS. This reflected in a higher proportion of young females indulging in RSB as compared to young males. Our findings also revealed that comprehensive knowledge of HIV/AIDS influences the risky sexual behaviour of young people. On average 54.4% of young women and 40.0% of young men were engaged in RSB. Age, level of education, place of residence, wealth status, listening to radio, watching television, and frequency of reading newspaper or magazine shown to have a significant relationship with RSB. Specifically, young people aged 15-19years, those with no formal education, residing in rural areas, poorest wealth quintiles and those who do not listen to radio nor watch television at all. These findings infer there is a need for targeted messages and interventions for the various categories of young people in SSA with relevant information on comprehensive knowledge of HIV/AIDS.

Abbreviations

AOR: Adjusted odd ratio.

DHS: Demographic and Health Survey

Ref: Reference category

RSB: Risky Sexual Behaviour

SSA: sub-Saharan Africa

Declarations

Ethics approval and consent to participate

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Consent for publication

Not applicable.

Availability of data and materials

All datasets are available online after submitting a concept note to www.dhsprogram.com/data/available-dataset.cfm

Competing interest

The authors declare that they have no competing interests.

Funding

This study received no funding.

Authors contribution

KSD conceived the study, had full access to the data and performed the initial analysis. AAS interpreted the data and review the methods. JO, FC, KSA, MA, AWAB drafted the first draft of the manuscript. BOA, KSD, AAS and KSA reviewed and drafted the second draft of the manuscript. All authors reviewed the manuscript for intellectual content and agreed and approved the final manuscript.

Acknowledgements

We acknowledge Measure DHS for providing us with the data upon which the findings of this study were based.

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Figures

Figure 1

Prevalence of RSB among young people in SSA