School of Public Health

National University of Rwanda

DETERMINANTS OF HIV RISKY SEXUAL BEHAVIORS AMONG FEMALE YOUTH (15-24 Years): A secondary analysis of 2010 RDHS data

Thesis presented to obtain Master degree in Science of Epidemiology

By: MUHAYIMPUNDU Ribakare

Supervisor: Jeannine CONDO, MD, MSc, PhD
Co-Supervisor: Dr. Védaste NDAHINDWA, MD, MSc

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LIST OF ACRONYMS

RDHS	Rwanda Demographic and Health survey
AIDS	Acquired Immune Deficiency Syndrome
HIV	Human Immunodeficiency Virus
UNAIDS	United Nations for Acquired Immune Deficiency Syndrome
BSS	Behavior Surveillance Survey
USA	The United States of America
CI	Confidence Interval
VIH	Virus d'Immuno Deficience Acquise
OR	Odd Ratio
NISR	National Institute of Statistics of Rwanda
ESA	Eastern and Southern Africa

SUMMARY

Background:

The fight against HIV has proven remarquable progress even though is still a public health concern worldwide.(1) HIV/AIDS pandemic is facilitated by risky behaviors among others: the nonuse of condom, multiple sexual partners, early sex debut expose the individual to the risk of infection. Therefore, for the better understanding of the dynamic of the epidemic, it is important to assess behaviors and to determine relation between different factors and risky behaviors in most at risk groups comprised of youth and more specifically young female. This study aims at identifying determinants of sexual risky behavior in Rwanda among young female. Key findings resulting from the study will inform programs about HIV prevention interventions among this group in general and sexual behaviors in particular among this risky group.

Methods:

The current study used data from the Rwanda 2010 Demographic and Health Surveys (RDHS), a Cross sectional study, nationally-representative conducted between the year 2009-2010. We performed a secondary data analysis using the RDHS 2010 dataset obtained from the National Institute of Statistics of Rwanda (NISR). We first select our target population with the RDHS 2010 population comprised of female youth 15-24 years who participated in the 2010 RDHS and performed the HIV test during the survey. Analyses have been run and the associations and dependency between variables using univariate and multivariate analysis have been established.

Results:

Our sample size had 2904 female youth who responded to the DHS interview and got an HIV test during the survey. Findings from the descriptive analysis revealed that the age group 15-19, never married, living in rural areas, richest class, protestant and primary level constituted the majority sub groups in the sample. Clinical and sexual behaviors characteristics demonstrated a majority of the sample was tested for HIV in the past, was negative for HIV test during the survey, had at least one sexual risky behaviour and knew at least one component of HIV comprehensive knowledge. The multivariate analysis using clustered logistic regression demonstrated a strong association between the dependent variable (sexual risky behavior) and wealth index with an OR [CI95%] of 2.467[1.310-4.644], primary education level with

an OR [CI95%] of 2.351[1.199-4.613] and secondary education level with an OR [CI95%] of 2.914 [1.065-7.974] as well as HIV test result during the survey with an OR [CI95%] of 3.275[1.927-11.56].

Conclusion:

Results from this study highlight the importance of education, financial empowerment and previous HIV tests as key determinants of HIV risky behaviors in youth aged 15-24 years. Further study on women empowerment (both education and finance) could contribute to the improvement of self-confidence to say "No" to HIV risky behaviors. In addition, an implementation of a focused health services interventions targeting youth in general and in particular in school could reduce risky behavior among the target group.

Keys words: Female youth, HIV risky behaviors, Rwanda

RESUME

Contexte:

La lutte contre le VIH a eu pas mal de succès même si la maladie reste un problème de santé public. Pendant les derniers décénies, l'épidémie du VIH a beaucoup changé surtout dans les pays en voie de développement. L'infection par le VIH est souvent facilitée par des comportements sexuels à risque tel que la non utilisation du condom, l'âge précoce du début de sexe, les partenaires sexuels multiples parmi tant d'autres. C'est pourquoi pour bien comprendre cette dynamique, il est important d'analyser le comportement à risque pour savoir leurs déterminants. Cette étude a pour objectif d'identifier les comportement sexuel a risque au Rwanda ainsi que leur déterminants pour informer les programmes.

Méthodes:

Cette étude a utilisé les données de l'enquête démographique pour la santé de 2010. En utilisant ces données, nous avons généré les données qui nous intéressent en fonction de notre population cible qui est les jeunes filles/femmes âgées de 15-24 ans. Les analyses se sont basées sur les associations entre les variables indépendantes et la variable dépendante.

Résultats:

Notre échantillon était de 2904 jeunes filles/femmes qui ont participé à l'enquête démographique de santé et qui ont été testés pour le VIH. L'analyse descriptive a montré que le groupe d'âge de 15-19, les non mariés, ceux qui vivent en milieu rural, la classe riche, les protestants ainsi que ceux qui étudient ou ont fini l'école primaire était prédominants de l'échantillon. La majorité a été testée dans le passé, était VIH négative lors de l'enquête, avait au moins un comportement sexuel a risque et connaissait au moins un des composantes des connaissances générale sur le VIH. L'analyse multi variée a montré une association, statistiquement significative, pour l'indice de richesse avec un OR [CI95%] de (2.467[1.310-4.644]), niveau d'éducation avec un OR [CI95%] de (2.351[1.199-4.613] pour l'école primaire et avec un OR [CI95%] de 2.914[1.065-7.974]) pour l'école secondaire et le VIH positive (3.275[1.927-11.56]) contre le comportement sexuel a risque.

Conclusion:

Les résultats de cette étude mettent en évidence l'importance d'évaluer le déterminants du comportement sexuel a risqué chez les jeunes de 15-24ans, ce qui va guider les programmer à faire des interventions focaliser.

Mots clés: Jeunes femmes/filles, comportement sexuel à risque, Rwanda

TABLE OF CONTENT

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I.   INTRODUCTION

The fight against HIV has proven remarquable progress even though is still a public health concern worldwide.(1) In the last ten years the HIV epidemics has changed dramatically, for the better in most countries, especially in sub-Saharan Africa countries. These countries are making more efforts towards reduction of AIDS epidemic with 700 000 fewer new HIV infections across the world in 2011 than in 2001. Fifty percent reduction in the rate of new HIV infections has been achieved in 25 low- and middle-income countries between 2001 and 2011. More than half of these countries are in sub-Saharan Africa where the majority of the new HIV infections occur.(2)

HIV/AIDS pandemic is facilitated by risky behaviors among others: the nonuse of condom, multiple sexual partners and early sex debut expose the individual to the risk of infection. Therefore, for the better understanding of the dynamic of the epidemic, it is important to assess behaviors and to determine relation between different factors and risky behaviors in most at risk groups.(3)

According to UNAIDS, young people aged 15–24 accounted for about 42% of new adult HIV infections in 2010, and around 5million young men and women are currently living with HIV. With the millions of new HIV infections predicted among young people in future years, AIDS will not be halted until young people have the knowledge and capacity to avoid behaviors that put them at risk.(2)

In Eastern and Southern Africa(ESA), around 2.7 million people aged 15 to 24 years live with HIV, more than half of all HIV-positive young people globally with countries like Botswana, Lesotho and Swaziland, counting for more than 1 in 10 young people who are infected.(4)

A cohort study done in England showed an association between HIV infection and younger age as well as multiple partner and same result have been observed during the multilevel analysis of the determinants of high risk sexual behavior in sub Saharan Africa .(5)(6)

A review of determinants of HIV prevalence done in south Africa found that the majority of socio demographic factors such as age, marital status, religion were associated with HIV infection.(7) The same study, showed a positive association between HIV knowledge and HIV status in south Africa.(7)

In Rwanda, HIV infection constitutes a major public health problem. Even though many efforts have been made by various partners involved in the fight against HIV/AIDS to limit the spread of this epidemic and to reduce its impact, this infection remains epidemic in the Rwandan population.(2)The epidemic is generalized in Rwanda as follows: the prevalence of HIV was 3% among persons 15-49 years old in 2010 and was higher in older people than in young people less than 25 years with a prevalence of around 1% in youth 15-24 years old.(8)

While Rwanda's HIV prevalence rate is low at 3%, many young people, especially girls, remain at risk of contracting the virus, this is because a large number of young people in Rwanda are unaware of the risks associated with HIV and particularly how to prevent against HIV. (9)

The HIV risky behavior is defined by BSS as unprotected sex during a risky sex, sex with multiple partners and early age at sex debut.(10)

The Demographic and Health survey 2010 found that HIV prevalence was high among female who reported the use of condom during their last sexual intercourse in the past 12 months(21%) compare to those who did not use a condom at last sex(3%).(8)

Regarding the HIV comprehensive knowledge, different studies showed that HIV knowledge in young people is still weak. In Rwanda youth BSS 2009, only 12% of participants reported having had comprehensive knowledge on HIV/AIDs. The use of condom at the last sex was also low (43%) and in the same BSS, 35% of young people aged 15-24 reported having sex in the past 12 months and among them 28% used condom. (10)

The Rwanda HIV National strategic plan which ended by 2012 shows that youth are considered as most at risk and vulnerable group because of poor knowledge related to HIV and AIDs, the low use of condom, sexual risky behaviors as well as the multiplicity of sexual partners.(11)

A cross sectional survey done in southern province of Rwanda among youth heads of households, showed that early sex was associated with low condom use in subsequent sex relationships.(12)

A study aimed at identifying determinants of risky behaviors in youth aged 15-24 years who attended the Rwanda international 2011 trade fair shows that 22% of participants were at low risk, 70% at moderate risk and 7.9% at high risk of contracting HIV.

Profession, age and the transactional sex were factors which mostly influenced HIV risky behaviors. (P<=0, 05) in the above study.(13)

The importance of this study is to analyze determinants of sexual risky behavior among youth female at large scale, which haven't been an interest of previous studies.

OBJECTIVE OF THE STUDY

II.1. General Objective

The current study aims at identifying determinants of risky behaviors among female youth aged 15-24 years selected for the 2010 RDHS.

II.2. Specific objectives

The specific objectives of the study are:

- ➢ To describe HIV risky behavior among female youth aged between 15-24 years
- ➢ To describe the HIV comprehensive knowledge
- ➢ To evaluate the association between HIV risky behavior and socio demographic factors, comprehensive knowledge factors, HIV testing (past and during the survey) factors among female youth who participated in the 2010 RDHS.

III. CONCEPTUAL FRAMEWORK

The main purpose of this study is to explore determinants of sexual risky behaviors among female youth aged 15 to 24 years in Rwanda. We analyzed the relation between risky behaviors and socio demographic characteristics, comprehensive knowledge on HIV and HIV testing as well as blood test result during the survey. Relationship between risky behaviors and socio demographic characteristics, knowledge on HIV and other factors are demonstrated in youth in Africa and elsewhere in the world.

Information related to determinants of risky behaviors in youth in RDHS exists but not explored, and we expect that the present research highlights the relation between risky behaviors in youth and other factors as shown in the figure below.

Figure: conceptual framework for the analysis of the determinants of HIV risky sexual behavior
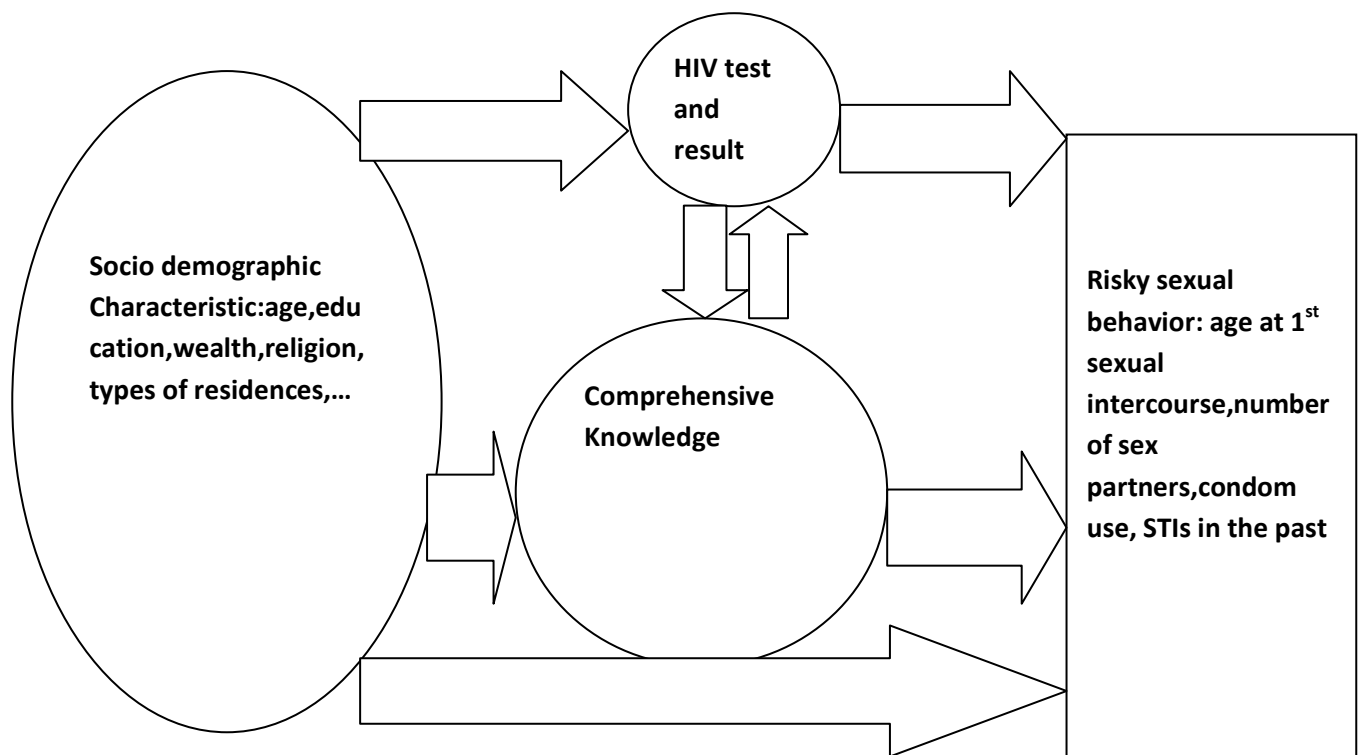
IV. METHODOLOGY

1. Type of Study (Study design)

The current study used data from the Rwanda 2010 Demographic and Health Surveys (RDHS), a nationally-representative cross sectional study.

2. Sampling method (RDHS 2010)

A representative sample of 12,792 households was selected in two stages for the 2010 RDHS. In the first stage, 492 villages were selected with probability proportional to the village size- the number of households residing in the village. Then at the second stage, a complete mapping and listing of all households existing in the selected villages was conducted. The resulting lists of households served as the sampling frame for the second stage of sample selection. Households were systematically selected from those lists for participation in the survey.

All of the 492 clusters selected for the sample were surveyed for the 2010 RDHS. A total of 12,792 households were selected, of which 12,570 households were identified and occupied at the time of the survey. Among these households, 12,540 completed the household questionnaire, yielding a response rate of nearly 100%. In the 12,540 households surveyed, 13,790 women age 15-49 were identified as being eligible for the individual interview. Interviews were completed with 13,671 of these women, yielding a response rate of 99.1 percent. Male and female interviews as well as HIV test were performed in every second household. A total of 2,904 women age 15-24 were tested for HIV in the subsample of households, which is our sample of interest.(8)

3. Definition of key variables

Our dependent variable is the high risk sexual behaviour defined as behaviours that lead a person or a group of people to HIV transmission. (14)

The mostly cited risky sexual behaviours are:

➢ Young age at first sex intercourse: sex debut at less than 18 years, the Rwanda BSS defined it as less than 15years old, which have been considered for our study
➢ Non-use of condom during a risky sex,

- ➢ Multiple sex partners: more than one,
- ➢ High rates of sexually transmitted diseases

Our independent variables that will be analyzed are the following:

- ➢ Socio demographic factors: age group, marital status, education level, wealth quintile, residence and religion,
- ➢ Comprehensive knowledge: knowing simultaneously that proper use of a condom and having one faithful uninfected partner can protect against HIV/AIDS, recognizing that a person apparently in good health can transmit HIV/AIDS and rejecting the transmission of HIV by a mosquito and sharing foods and drinks with a positive person .(8)(10),
- ➢ HIV testing before the survey,
- ➢ Blood result test during the survey.

Two Composite variables were created as follow:

- • Comprehensive knowledge:

- ➢ level 1: know any of all five components(knowing simultaneously that proper use of a condom and having one faithful uninfected partner can protect against HIV/AIDS, recognizing that a person apparently in good health can transmit HIV/AIDS and rejecting the transmission of HIV by a mosquito and by sharing foods and drinks with a positive person)

- ➢ level 2: know at least one of the five components
- ➢ level 3: know all five components

- • Risk sexual behavior:

- ➢ Level 1: has any risk sexual behavior (Young age at first sex intercourse: less than 15years old, non-use of condom during a risky sex, multiple sex partners: more than one, high rates of sexually transmitted diseases.
- ➢ Level 2: has at least one of components of risky sexual behavior

4. Data management and analysis

Data sets of the RDHS 2010 have been provided to us to allow its secondary analysis. We selected our target population with the RDHS 2010 population which are female youth 15-24 years who participated in the 2010 RDHS and performed the HIV test during the survey. Analyses were performed using proportions for univariate analysis, clustered simple logistic regression for bivariate analysis. For testing the strength of the association between the predictors and the outcome, a clustered multivariate logistic analysis was performed and thus after applying the weight variable based on population weight (pweight) in the aim of performing the true estimates including 95% confidence intervals.

Weight variable was used because of the non proportional allocation of the sample to the different provinces and their districts and the possible differences in response rates, sampling weights is required for any analysis using 2010 RDHS data; this ensures the actual representativeness of the survey results at the national level as well as at the domain level.

Data Analysis Model was developed into Stata v.12 using svy to account for sampling weight, clustering of observations by village and stratification by district. Clustered multiple logistic regression analysis was then used to assess the difference in risky behaviour between groups of youth varying characteristics.

The goodness of fit was used to check the fitness of the model after performing the multiple clustered logistic regression with p value of less than 0.05.

V. RESULT

1. Description of the sample

Female youth aged 20-24 years were 54% and those aged 15-19 years were 48%. The majority of the sample was never married. Eighty four percent of our population lived in rural area. Regarding the level of education, our population was generally educated but the majority of the population was in primary school. According to the religion, 56% was protestant and only 16% were in the poorest category.

1.1 Socio demographic description

Table1 below shows a tendency of predominance of the age group of 15-19 as compared to the age group of 20-24 years. The majority was never married, living in rural area. The majority of the sampled youth was protestant and had completed at least primary school. There was an equal distribution of 1/5 wealth index in different categories (poor, middle, richer) except from the 2 extreme groups (poorest (16%) and richest (24%)).

Table 1: Socio demographic Characteristics

	n	Percent
Over all	2904	100
Age group		
15-19	1532	52
20-24	1372	48
Marital status		
never married	2296	79
in union	537	18
divorced/separated/widow	71	3
Residence		
Rural	2432	84
Urban	472	16
Wealth index		
Poorest	462	16
Poorer	580	20
Middle	577	20
Richer	577	20
Richest	707	24
Religion		
Catholic	1249	44
Protestant	1593	55.2
Muslim	24	0.8
Education level		
no education	174	6
Primary	2047	71.2
Secondary	658	22
Higher	24	0.8

1.2. HIV Testing and Results

Of the 2904 young female in the sample, the majority has been tested for HIV (62%) before the current RDHS. Table 2 below shows result from HIV test during the 2010 RDHS. The majority of the target group was found to be HIV negative (98.5%) and only 1.5% was positive.

Table 2: HIV Test and Results

	n (2904)	Percent
Ever been tested for HIV		
No	1112	38.4
Yes	1791	61.6
HIV Test Result during DHS		
HIV negative	2860	98.5
HIV positive	44	1.5

1.3. Sexual risky behavior and comprehensive knowledge

Sixty percent of our population has no risky behavior as per our definition of risky behavior.
Findings showed that 96% have at least one of the 5 components of comprehensive knowledge while only 3% had comprehensive knowledge, as shown in the table below.

Table 3: Sexual risk behavior and comprehensive knowledge

	N	Percent
Sexual risky behavior		
Has no sexual risky behavior	375	37.58
Has at least one sexual risky behavior	623	62.42
Comprehensive knowledge		
Has any comprehensive knowledge	22	0.75
Has at least one of comprehensive knowledge	2,809	96.1
Has all comprehensive knowledge	92	3.15

2. Predictors of risky sex behavior

In this part of analysis, we demonstrated relationship between HIV risky behaviors and other independent variables both in bivariate and multivariate analysis. The clustered simple logistic regression was performed and almost all predictors were associated with the outcome. The unadjusted OR [95% CI] were statistically significant for age group, education level, religion status, wealth index, HIV test in the past and current HIV blood test result.

The clustered multivariate logistic regression show that young females enrolled in primary and secondary education levels had an OR [95%CI] of 2 [1.199- 4.613] to 3 times [1.065- 7.974] more likely to have a risky sexual behavior as opposed to non educated young female. Likewise, the richest population had an OR [95% CI] of 2.5 [1.310- 4.644] as opposed to the poorest population. Lastly, the strength of the association between HIV blood result and sexual risky behavior was also statistically significant. The reported OR [95% CI] of the HIV blood result was 3.275 [1.310- 4.644].

Table 4: Predictors of risky behavior

	Unadjusted OR[a]	95% CI	Adjusted OR[b]	95% CI
Age group				
15-19	1		1	
20-24	0.219***	0.147 - 0.328	0.991	0.505- 1.941
Education level				
no education	1		1	
Primary	1.811***	1.185 - 2.769	2.351**	1.199- 4.613
Secondary	5.558***	2.939 - 10.51	2.914**	1.065- 7.974
Higher	7.840***	2.206 - 27.86	2.433	0.318- 18.62
Religion				
Catholic	1		1	
Protestant	0.715**	0.543 - 0.941	0.712	0.483- 1.049
Muslim	3.665	0.847 - 15.87	3.881	0.703- 21.44
Wealth index				
Poorest	1		1	
Poorer	0.916	0.591 - 1.419	1.227	0.708- 2.125
Middle	1.065	0.710 - 1.597	1.175	0.698- 1.977
Richer	1.131	0.745 - 1.718	0.827	0.451- 1.516
Richest	2.994***	1.885 - 4.753	2.467***	1.310- 4.644
Comprehensive knowledge				
Has any comprehensive knowledge	1		1	
Has at least one of comprehensive	2.465	0.152 - 39.94	1.492	0.158- 14.10
Has all comprehensive knowledge	3.455	0.196 - 61.01	1.964	0.179- 1.55
Ever been tested for HIV				
No	1		1	
Yes	0.222***	0.120 - 0.410	1.964	0.481- 8.027
HIV Test Result during DHS				
HIV negative	1		1	
HIV positive	3.348**	1.258 - 8.915	3.275*	1.927- 11.56

[a]: unadjusted OR using clustered logistic simple regression   [b]: adjusted OR using clustered multiple logistic regression

*** $p<0.001$. ** $p<0.01$. *$p<0.05$.

Finally the goodness of fit was performed to check the overall model fit.

Table below shows F test result and associated P value strongly significant, indicating that the overall model fits as opposed to a model with only intercept.

Goodness of fit test

Number of observations   978
F-adjusted test statistic   =   F(9,388)   =   1449.613
Prob > F   <   0.001

VI. DISCUSSION

The main objective of our study was to identify determinants of risky behaviors among female youth in Rwanda using 2010 DHS data.

Our study intended to analyze socio demographic characteristics of participants as well as other factors influencing risky behavior among others.

The majority of our population was aged 15-24 (52%). Regarding the level of education, more than 71% were or have finished primary school, 84% were living in rural area while 16% where in urban. Seventy six percent of our population was not married.

Among sociodemographic characteristics, the level of education and wealth index were found, statistically significant, associated with sexual risky behaviors.

The HIV positivity during the survey has been identified as more likely to be a factor of sexual risky behavior.

The Rwandan youth BSS in 2009 found the same result as our findings where the majority of participants were aged 15-19 years (61%). [10]

Findings from this study corroborate with those from USA which found that education level was also associated with development of sexual behavior which leads to HIV infection. (16)

The same study found that low income was more likely to be associated with sexual risky behavior in USA.(16)

In Nigeria, a study conducted on Predictors of Condom-use among Young Never-married found about 54% of them were aged 15-19 years while the remaining 46% were aged 20-24years. Their median age was 19 years. The survey indicated that more than half of the respondents resided in rural areas.(17)

A meta-analysis done in USA, which analyses risky behavior among in school youth found similar result to our study where the HIV positive status has also been found to be positively associated with sexual risky behavior. (18)

Different to our findings one out of four, 677 (24.5%), in-school Ethiopian adolescents have comprehensive HIV/AIDS knowledge. The knowledge was better among in-school adolescents from families with a relatively middle or high wealth index (adjusted OR [95% CI] =1.39 [1.03–1.87] and 1.75 [1.24–2.48], respectively). (19)

A study conducted in USA, to analyze the Sexual Relationship Power Scale (SRPS) showed that women with high levels of relationship power were five times as likely as women with low levels to report

consistent condom use. Women with high levels of relationship power were five times as likely as women with low levels to report consistent condom use. (20)

Population attributable risk estimates indicate that 52% of the lack of consistent condom use among women can be attributed to low sexual relationship power.(20)

Although we are presenting these findings, we recognize some limitations such as doing a secondary analysis which may lead to some important missing information, respondent bias but the sensitivity analysis and the use of DHS data for other analysis give us confidence to trust these data and findings from this study.

VII. CONCLUSION

The overall study objective was to explore the association between risky behavior and socio-demographic, comprehensive knowledge and clinical factors among young females aged 15-24 years.

The age group of 15-19 was predominant, majority of our population were single, living in rural area. Protestant religion is predominant, majority completed primary school. The majority of our population has ever been tested for HIV (62%). Among youth female who have been tested during the 2010 RDHS, 98.5% were found HIV negative while only 1.5% was positive. Sixty percent of our population has no risky behavior, 96% have at least one of the five components of comprehensive knowledge while 3% have comprehensive knowledge.

In the multivariate analysis, education levels (primary and secondary), richest group and HIV test blood results were the strongest predictors of risky behaviors among young females aged 15-24.

VIII. RECOMMANDATION

In this part, we will propose some recommendations for policy improvement:

➢ Considering the low HIV comprehensive knowledge reported by youth, interventions to raise the comprehensive knowledge should be implemented, development of education program and dissemination of all types of information

➢ Sexual relation power should focus on both educated and uneducated female to build their confidence in term of sex negotiation,

➢ Sensitization and prevention education should be well integrated in school curriculum to allow youth at school to be well informed and avoid their sexual behavior,

➢ The richest people are more likely to have sexual risky behavior, appropriate measures should be put in place at all levels of social layers especially for rich population including sensitization of their parents for a family dialogue about reproductive health and HIV.

➢ The prevention with positive strategy need to be reinforced to prevent new infection.

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