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AGE-DISPARATE RELATIONSHIPS AND HIV PREVALENCE AMONG NEVER MARRIED WOMEN IN RAKAI, UGANDA

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Abstract

Background: Age-disparate relationships are associated with increased HIV prevalence. We determined whether the frequency of age-disparate relationships in never married women changed over time and whether they are associated with HIV prevalence in Rakai, Uganda.

Methods: 10,061 never married women, aged 15–49 in the Rakai Community Cohort Study provided information on the age of their male sexual partners from 1997 to 2013. Logistic regression was used to assess trends in age-disparate relationships (≥ 5 years) between never married women and their male partners. Log-binomial regression was used to estimate adjusted prevalence ratios (adjPR) of HIV prevalence associated with age-disparate relationships.

Results: 2,992 women (30%) had a male partner ≥ 5 years older which remained stable over time. The prevalence of HIV among women in age-disparate relationships was 14%, 10% for women in relationships with men 0–4 years older (adjPR 1.36, 95% CI 1.22, 1.53) not controlling women's age, however after age adjustment the impact of age-disparate relationships on HIV prevalence was attenuated. Age-disparate relationships were associated with increased HIV prevalence among women aged 15–17 (adjPR 1.83, 95% CI 1.10, 3.19), but not in other age groups.

Conclusions: The frequency of age-disparate relationships among never married women were unchanged over a 15-year period in Rakai, Uganda. Age-disparate relationships were associated with increased HIV prevalence among adolescents 15–17, but not older women.

Keywords

HIV; age difference; never married women; Rakai; Uganda

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Introduction

Many studies have explored risk factors for HIV in young women^{1, 2}. Large age differences between women and their male sexual partners is associated with increased incidence and prevalence of HIV, particularly in Africa, and such relationships are common in the region³⁻⁹. The World Health Organization recognized that young women in sexual relationships with older men are at increased risk of HIV¹⁰; although some studies reported that age difference between sexual partners was not associated with HIV¹¹⁻¹³.

Partner concurrency is common among older male partners of young women^{14, 15} and multiple sexual partners increase the risk of HIV¹⁶⁻¹⁸. Young women in sexual relationships with older men are also more likely to experience physical violence, rape, other forms of abuse¹⁹⁻²¹, and HIV infection^{19, 20, 22-25}. Gender based economic disparities may motivate younger women to engage in age-disparate sexual relationships to meet their material needs²⁶, and women's ability to negotiate safer sex is reduced by age differences and economic disparities^{27, 28}. Condom use is also less likely among women in age-disparate sexual relationships compared to women in sexual relationships with men of similar age^{5, 6, 27, 29, 30}. It is well established that HIV prevalence increases with age⁹, hence women with older male sexual partners are more likely to have relationships with men who are already infected^{7, 14}.

The U.S. President's Emergency Plan for AIDS Relief has established the DREAMS Initiative, a program targeting young women in 10 selected African countries, including Uganda, where young women experience a high burden of HIV³¹. The DREAMS Initiative aims to reduce risky sexual behaviors and age-disparate sexual relationships for financial and material exchange. Cash transfers, for young women have been used to retain girls in school and reduce their economic reliance on older male sexual partners³². In South Africa, child-focused cash transfers significantly reduced age-disparate sexual relationships and other risk behaviors among adolescent girls³²⁻³⁴. A recent interventional trial did not find any statistically significant association between cash transfer and reporting an age disparate sexual relationships³⁵.

Little is known about time trends in age differences between never married women and their male sexual partners, which is crucial for public health programs focused on reducing age-disparate relationships. In 1997, the government of Uganda created a national policy of free Universal Primary Education which led to a substantial increase in school enrollment and delays in sexual debut in girls^{36, 37}. Additionally, there were economic improvements which could affect the financial incentive for age-disparate relationships³⁶. For instance, the Uganda GDP per capita (current US\$) increased from \$287 in 1997 to \$655 per person in 2013³⁸. We examined the trends in age differences between never married women and their male sexual partners from 1997 to 2013 in Rakai, Uganda and the associations with prevalent HIV.

Methods

Data were derived from the Rakai Community Cohort Study (RCCS) which is an open cohort of 50 communities in rural Rakai District, Uganda. Following a household census, all consenting participants are contacted by trained same sex interviewers at 12–18-month intervals to collect behavioral, health, demographic, and socioeconomic information and biological samples^{39, 40}.

The current analysis includes 10,061 never married women aged 15–49 who provided information on the age of their male sexual partners from 1997 to 2013. Age difference between partners was coded as 0–4 years and 5+ years defined as age-disparate by UNAIDS⁴¹ and previous literature^{11, 33, 34}. Participants also provided information on education, number of sex partners in the 12 months prior to the interview, condom use (classified as ‘never,’ ‘sometimes/inconsistent,’ and ‘always’) in the past year, geographic location (rural or urban) at the time of the interview and whether the participant drank alcohol before the last sexual intercourse with their most recent sexual partner within the past 12 months prior to the interview.

The RCCS was approved by Institutional Review Boards (IRB) in Uganda (The Scientific and Ethics Committee of the Uganda Virus Research Institute and the Uganda National Council of Science and Technology) and IRBs at Johns Hopkins University and Western IRB. All subjects provided written informed consent. The research was conducted in accordance with the principles expressed by the Declaration of Helsinki.

Descriptive analysis estimated the proportions of women in age-disparate relationships by RCCS survey. Logistic regression was used to assess for trends in age disparate relationships. Log-binomial regression was used to estimate unadjusted and adjusted prevalence ratios (adjPR) of prevalent HIV associated with age-disparate relationships. Analyses were also stratified by women’s age (15–17, 18–20, 21–22, and 24+). Women who were older than their male partners were evaluated separately. Associations with a two-sided p-value ≤ 0.05 were considered statistically significant. STATA 14 was used for analysis⁴².

Results

Women in Relationships with Men of the Same Age or Older

Among women in relationships with men of the same age or older, 2,992 women (30%) had a male partner ≥ 5 years older. The overall median age difference was 3 (IQR: 2,5)The median age difference was 2 years (IQR: 1,3) for participants in relationships with men 0–4 years older and 7 years (IQR: 5,10) for participants in relationships with men ≥ 5 years older. Women in an age-disparate relationship were older (median age 22, IQR 15, 26) than women in relationships with age differences of 0–4 years (median age 19, IQR 15, 30). There was no change in the frequency of age-disparate relationships over time; in 1997, 29% (95% CI 25, 33) of women were in an age-disparate relationship, compared to 33% (95% CI 30, 37) in 2013 (Figure 1).

Younger women, aged 15–17 years, constituted 23% (2,319) of the never married population and among this younger population the frequency of an age-disparate relationship was 17% in 1997 and 16% in 2013. For women 18–20 years of age, the proportion in age-disparate relationships was 21% in 1997 compared to 27% in 2013, among women aged 21–23 the age-disparate relationship in 1997 was 35% compared to 42% in 2013, and in women aged 24+ years old the proportion in age-disparate relationship in 1997 was 37% compared to 42% in 2013.

HIV status was available for 95.7% (9,625/10,061) of women. The prevalence of HIV was higher among women in an age-disparate relationship (14.0%) compared to women with partners 0–4 years older (9.8%). After adjusting for education, number of sexual partners, location, alcohol before sex, and condom use, the adjPR comparing women in age-disparate relationships to women in relationships with men of similar age was 1.36 (95% CI 1.22, 1.53) (Table 1). However, after adjustment for the woman's age, this association was attenuated (adjPR 1.03, 95% CI 1.00, 1.16). Compared to women with one sexual partner, the prevalence of HIV increased among those with two sexual partners (adjPR 1.30, 95% CI 1.12, 1.51), and three or more sexual partners (adjPR 1.98, 95% CI 1.56, 2.52). Compared to women who did not have alcohol before sex, women who reported using alcohol before sex had increased HIV prevalence (adjPR 1.14, 95% CI 1.02, 1.28). Factors associated with a lower HIV prevalence included consistent condom use (comparing women who always used condoms to women who never used condoms (reference group), adjPR 0.71, 95% CI 0.62, 0.83), rural residence (comparing rural residents to urban residents (reference), adjPR 0.82, 95% CI 0.73, 0.92), and primary (adjPR 0.68, 95% CI 0.48, 0.96) and high school (adjPR 0.53, 95% CI 0.37, 0.75) education (compared to women with no education). Factors not associated with HIV prevalence were tertiary education and inconsistent condom use.

In the age stratified analysis, HIV prevalence increased with women's age. HIV prevalence among women 15–17 years of age was 3%, women 18–20 years of age 5%, women 21–23 years old 11%, and women 24+ years 23%. HIV prevalence among women 15–17 years in age-disparate relationships was higher compared to those in relationships with men of similar age (adjPR 1.83, 95% CI 1.05, 3.19), but there was no increased risk of prevalent HIV in older women (see Table, Supplemental Digital Content 1–4, which demonstrates HIV prevalence ratios by age group).

Among all age groups, HIV prevalence was higher among women reporting multiple sexual partners compared to women with a single sexual partner (see Table, Supplemental Digital Content 1–4, which demonstrates HIV prevalence by age group). Compared to women with no education, secondary education was associated with lower HIV prevalence among women aged 15–17 and 18–20, but not among older never married women (see Table, Supplemental Digital Content 1–4, which demonstrates HIV prevalence ratios by age group). Condom use, consuming alcohol before sex, and location (urban/rural) were not significantly associated with HIV prevalence in any age group (see Table, Supplemental Digital Content 1–4, which demonstrates HIV prevalence ratios by age group).

Women in Relationships with Younger Men

A small number ($n=334$) of never married women were in relationships with younger men. The average age of women in relationships with men 1–4 years younger was 28 years (IQR 23,34), and 37 years (IQR 35,41) for those in relationships with men 5 or more years younger. HIV prevalence among these women was 20%. For those in relationships with men 1–4 years younger the HIV prevalence was 19% and for those in relationships with men 5 or more years younger the HIV prevalence was 22% (adjPR 0.95, 95% CI 0.46, 1.97). (see Table, Supplemental Digital Content 5, which demonstrates HIV prevalence ratios for women in relationships with younger men).

Discussion

No change was found in the frequency of age-disparate relationships among never married women and their male sexual partners over time in Rakai, Uganda. Age-disparate relationships are associated with higher HIV prevalence among younger women aged 15–17. Having multiple sexual partners and using alcohol before sex were associated with increased prevalent HIV, and consistent condom use, rural residence, and having primary or secondary education, but not tertiary, were associated with lower HIV prevalence.

In the age stratified analysis, younger women (15–17 years of age) in age-disparate relationships had an increased risk of prevalent HIV compared to women not in such a relationship, but not in the other age groups. High school education was associated with markedly lower HIV prevalence, especially among women 15–17 years of age). These findings strongly support the implementation of interventions such as DREAMS³¹ and cash transfers^{33,34} to promote the retention and completion of education to prevent HIV acquisition in these young women.

A prior study in Rakai, Uganda found that the adjusted HIV prevalence ratio was increased among women aged 15–19 years with male sexual partners 10 or more years older⁴. However, studies in South Africa did not find an association between age-disparate relationships and HIV risk^{11–13}. A different study in Rakai showed that HIV incidence decreased over time among young women 15–19 due to delayed sexual debut associated with increased school enrollment and retention³⁶ and reduced HIV risk behaviors including increased condom use, fewer recent sexual partners, less sexual concurrency, and lower rates of alcohol use before sex³⁶. **Our study demonstrates that the frequency of age disparate relations among never married women has not changed over time**

There are limitations to this study. There is a potential for recall and social desirability bias and male partners were not interviewed to confirm their age. There was insufficient power to assess age-disparate relationships among women who were older than their male partners. It is also unknown why the impact of being in an age-disparate relationship becomes attenuated once the women reach the age of 18. Notwithstanding these limitations, this study has strengths, such as the use of a representative sample and the consistent measurement of partner age differences in a series of cross-sectional studies for over 15 years.

In conclusion, the frequency of age-disparate relationships among never married women has not changed over time. Being in an age-disparate relationship was associated with increased HIV prevalence among high school aged women, and high school education was associated with reduced HIV prevalence in this young age group. These results suggest the need for continued female education and health education to discourage age-disparate relationships in this young and vulnerable population.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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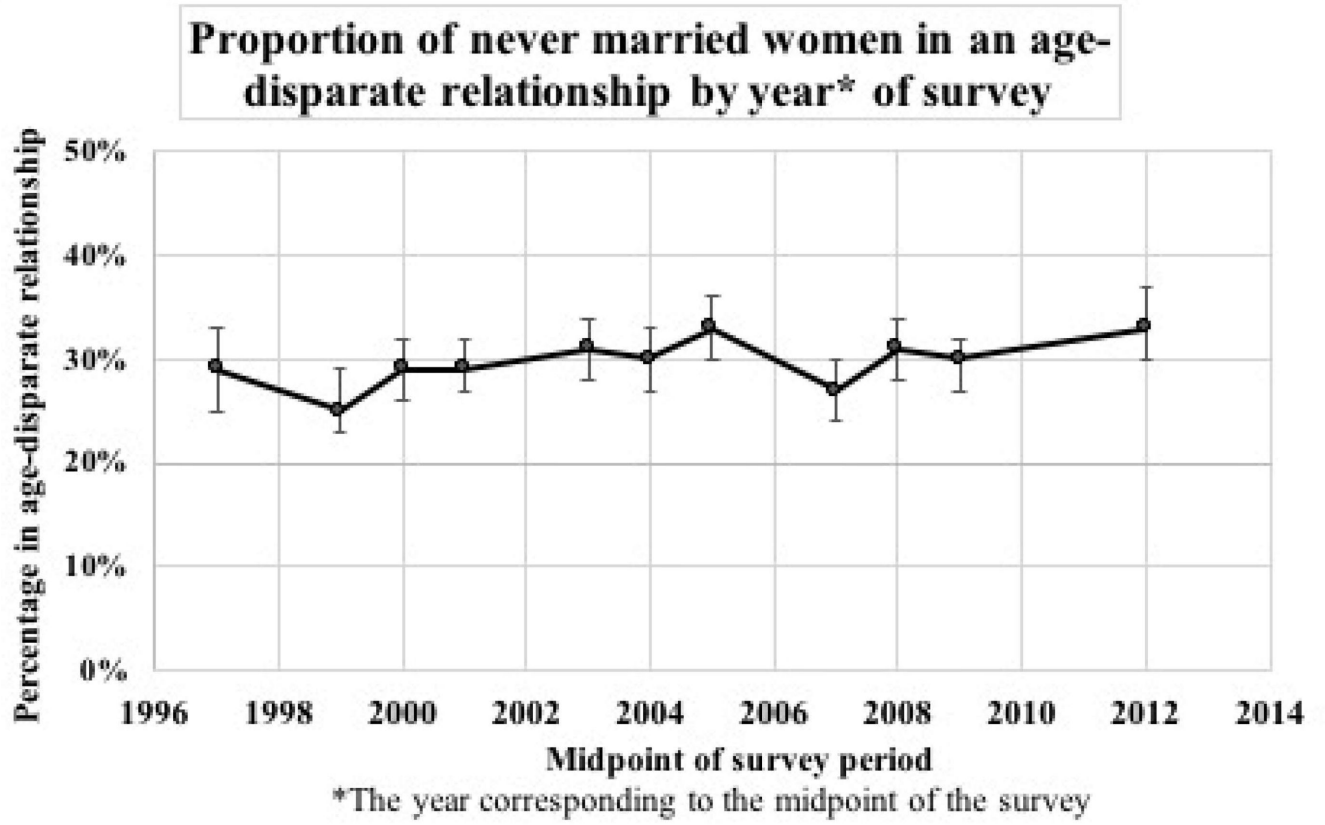


Figure 1:
Prevalence for the survey rounds are presented with 95% confidence intervals.

Table 1.

The prevalence of HIV among 9,624 never married women from Rakai, Uganda (1997–2013).

Risk factors	N (%)	HIV prevalence	UnadjPR(95% CI)	AdjPR(95% CI)
Age difference (years)				
0–4	7,068(70)	(663/6758) = 9.8%	1.00	1.00
5+	2,992(30)	(402/2,866) = 14%	1.43(1.27,1.61)	1.36(1.22,1.53)
Number of sex partners				
1	8,362(83)	(826/7,959) = 10%	1.00	1.00
2	1,387(14)	(180/1,357) = 13%	1.28(1.10,1.49)	1.29(1.11,1.50)
3+	311(3)	(59/308) = 19%	1.85(1.45,2.34)	1.94(1.53,2.45)
Condom use				
Never	3,920(39)	(465/3,729) = 12%	1.00	1.00
Inconsistent	2,733(27)	(321/2,634) = 12%	0.98(0.86, 1.12)	0.99(0.86,1.13)
Always	3,407(34)	(279/3,261) = 9%	0.69(0.60,0.79)	0.72(0.62,0.83)
Alcohol before sex				
Yes	4,610(46)	(436/4,270) = 10%	1.00	1.00
No	5,450(54)	(629/5,354) = 12%	1.15(1.03,1.29)	1.14(1.02, 1.28)
Education				
No education	149(1.5)	(26/139) =19%	1.00	1.00
Primary	4,226(42)	(513/4,058) =13%	0.68(0.47,0.96)	0.68(0.48,0.97)
Secondary	5,447(54.2)	(485/5,200) =9%	0.50(0.35,0.71)	0.53(0.37,0.75)
Tertiary	238(2.4)	(41/227) =18%	0.97(0.62,1.50)	0.96(0.62,1.49)
Location				
Urban	3,437(34)	(416/3,268) =13%	1.00	1.00
Rural	6,623(66)	(649/6,356) =11%	0.80(0.71,0.90)	0.82(0.73,0.92)

UnadjPR = unadjusted prevalence ratio, AdjPR= adjusted prevalence ratio, CI= confidence interval