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The importance of HIV prevention messaging for orphaned youth in Zimbabwe

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Abstract

The AIDS epidemic has contributed to a drastic increase in the number of orphans in Zimbabwe. Female adolescent orphans are particularly in jeopardy of contracting HIV due to disadvantages including extreme poverty, low education, and the absent of parental oversight which can lead to higher risk-taking sexual behaviors. By understanding where girls receive education about HIV and who they rely on for information, organizations can effectively modify existing programs to better target this at-risk population. For this study a household survey was conducted which included 216 orphans and 324 non-orphans (n=540), aged 12–17 years old, in the resource-poor setting of Hwange District, Zimbabwe. The aims of this paper were to examine the differences between orphans and non-orphans in HIV prevention message exposure, level of motivation for learning about HIV, and communication with caregivers about safe sex. The household survey revealed that younger orphans, aged 12–15 years old, were more motivated to learn about HIV and had greater HIV messaging exposure in school than non-orphans. These exposure and differences in the levels of motivation between groups dissipated at older ages. Our research also discovered less caregiver communication among orphans than non-orphans. Our findings suggest that HIV programs targeting orphans need to do a better job at keeping older orphans interested in HIV prevention at a time when it matters most. Furthermore, intervention strategies that provide caregiver support are instrumental in effectively delivering prevention messages to girls at home.

Keywords

orphans; AIDS; parent communication; HIV prevention programs; Zimbabwe; adolescents

Introduction

In sub-Saharan Africa, HIV/AIDS is producing orphans¹ faster than any other cause (Joint United Nations Program on HIV/AIDS (UNAIDS), United Nations Children's Fund (UNICEF), & United States Agency for International Development (USAID), 2004). In 2009 the Joint United Nations Program on HIV/AIDS UNAIDS estimated between 14–19 million orphans worldwide (UNAIDS, 2010). Sub-Saharan Africa alone houses between 13–17 million orphans, and is the only place in the world where rates of orphaning are increasing (UNAIDS, 2010; UNAIDS, United Nations Children's Fund (UNICEF), & United States Agency for International Development (USAID), 2004; World Health Organization (WHO), Department of Gender and Women's Health, 2003). According to the 2005–2006 Demographic Health Survey (DHS), Zimbabwe alone has an estimated 24% of

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¹An orphan is defined as a child under the age of 18 living without one or both parents.

children under the age of 18 years living without one or both parents (Central Statistical Office (CSO) [Zimbabwe] & Macro International Inc., 2007; Singh, et al., 2010; Singh, et al., 2008). A disproportionate number of these orphans are of adolescent age with over half of all orphans, globally, aged 12 or older (UNAIDS, UNICEF, & USAID, 2004).

Parental death can be particularly detrimental in the adolescent years when youth are developing intimate relationships and initiating sexual activity. US-based research has shown that adolescent girls who regularly discuss sex with their parents are less likely to engage in risky sexual behaviour and more likely to negotiate safe sex with their partner than girls who did not talk with their parents about sex (Crosby, et al., 2000). Several African and US-based studies have shown that without parental guidance, adolescents are more susceptible to sexual peer pressure (Baptiste, Tolous-Shams, Miller, McBride, & McKay, 2007; McBride, Paikoff, & Holmeck, 2003) and exhibit higher sexual risk-taking behaviours including early sexual debut, unprotected sex, and multiple sexual partners (Antwine et al. 2005; Birdthistle et al., 2009; Cowen & Pettifor, 2009; Gregson et al., 2005; Hallman 2004; Kang et al. 2008; Makame et al., 2004; Operario, Pettifor, Cluver, MacPhail, & Rees, 2007; Thurman, Brown, Richter, Maharaj, & Magnani, 2006). These unsafe sexual behaviours increase the risk for unforeseen adverse health outcomes including STIs, unplanned pregnancies, and HIV among uninformed youth. This vulnerability is particularly concerning given that of all new HIV cases worldwide, 45% are among adolescents aged 15–24 (Commission on HIV/AIDS and Governance in Africa (CHGA), 2004; UNAIDS, 2010; WHO, 2003).

HIV prevention is particularly important for female orphans because they are disproportionately affected by HIV and are biologically at greater risk of infection (CHGA, 2004; UNAIDS, 2008; WHO 2003). Researchers have shown a significant association between parental death and unprotected sexual behaviours among both male and female South African orphaned adolescents, with higher rates of HIV exclusively among female orphans (Operario et al., 2007). Gregson et al. (2005) found that female orphans in Zimbabwe were significantly more likely than non-orphans to be infected with HIV, experience symptoms of STIs, or to have been pregnant (Gregson, et al., 2005). Similarly, a study in urban Zimbabwe found that female adolescent orphans were at higher risk of HIV and Herpes Simples Virus (HSV) than non-orphans. Orphans more frequently had multiple sexual partners, used condoms inconsistently, and experienced forced sex as compared to their non-orphaned counterparts (Birdthistle et al., 2009).

Given its importance in reducing infection rates, HIV education must occur early in a child's development in order to inculcate preventative norms and protective behaviours prior to sexual debut (Mishra & Bignami-Van Assche, 2008). Even for young people who are not yet engaging in risky behaviours, HIV prevention education is important for ensuring sexual preparedness, as they will soon be faced with sexual circumstances that put them at risk. In a South African study, orphans were one and a half times more likely to engage in sexual activities as non-orphans and did so at younger ages (Thurman et al., 2006). Similarly researchers conducting a study in urban Kenya found that the disruption of the family structure caused by parental death was a strong predictor of early sexual debut for orphans (Goldberg, 2010).

To date, minimal work has been done examining the difference in exposure to HIV education between orphans and non-orphans. Unravelling adolescent orphan/non-orphan cohort differences will better equip policymakers and programmatic decision-makers with considerations for delivering HIV prevention programs to those who need it most in the most effective way possible. The goal of this study was to examine the differences in

exposure to HIV prevention messaging and motivations for learning about HIV between orphan and non-orphans girls aged 12–17 in Zimbabwe.

Methods

Procedures

Study data was collected from a household survey conducted in 2006 in Hwange District, Zimbabwe. Households were selected through a multistage stratified random sampling methodology whereby Hwange District was subdivided into five areas: Victoria Falls town, Hwange urban, Hwange rural, resettlement area, and growth point centres (Dete and Kamativi). The number of interviews conducted in each area was based on the proportion of households to the overall size of the district or ward.

Before beginning the interview process, the research team informed local leaders of the survey and obtained their consent for the related activities. Interviewers obtained consent from both the adult head of household and the girl interviewee prior to administering the survey. Participants were informed that the aim of the interview was to identify where better health programs for youth were needed. If multiple girls of eligible status were living in a household, one was chosen at random using the KISH Grid (Kish 1949). Due to the sensitivity of the questions regarding sexual behaviours, interviewers took great care to ensure confidentiality for all participants. Interviewers informed all participants of their option to decline response to any question and ability to withdraw from study participation at any time. All interviews were anonymous and held in seclusion from other household members. Interviewers were carefully trained on asking questions regarding sensitive topics through discussions, role plays and practice interviews.

Measures

Questionnaires were collaboratively developed by MEASURE Evaluation and the Biomedical Research and Training Institute (BRTI). The questionnaire included both a module for caregivers and for the girls themselves. Both modules included content areas on socioeconomic status, household caring practices including but not limited to communication about sex and HIV, sexual behaviour, places of socialization, HIV testing history, drug and alcohol use, and exposure to and sources of HIV prevention. Prior to the start of fieldwork, the survey was translated into the local language Ndebele, piloted, and revised as needed.

Statistical Analysis

Chi-square tests of group differences were used to compare the frequencies of selected dichotomous dependent variables including socioeconomic situation, sources of HIV prevention messages, participation in prevention activities, and caregiver communication about sex and HIV. Results were stratified by orphan status and age group (12–15 years old and 16–17 years old).

Results

Demographic Information

A total of 540 out of 549 girls aged 12–17 years participated in the household survey resulting in a response rate of 98%. Two hundred and sixteen girls (40%) were orphans, having lost either one or both parents. Nearly 31% of all girls self-reported losing a father, 22% reported losing a mother, and 12% reported losing both parents. The mean age for girls who lost a mother was 10 years old, while the mean age for girls who lost a father was 9

years old. Of the total interviewees, 63% of the girls were 12–15 years old with 39% of these younger girls being orphans. Approximately 37% of all girls were 16–17 years old with 42% of these older girls being orphaned. Head of household for orphans varied substantially, with 23% of orphans living with mother only, 7% living with father only, 6% living with a stepparent, 11% living with a sibling, 17% living with a grandparent, 26% living with a relative, and 11% living with some other type of foster caregiver.

Socioeconomic Information

The socioeconomic situation of orphans compared to non-orphans was only moderately different with slight variations between age groups. For the total category of girls aged 12–17, 22% of orphans had less than three meals per day ($\chi^2 = 1.84$, $p=0.17$). Orphans were less likely to have a change of clothes with significant differences identified in both age groups. Approximately 16% of younger ($\chi^2=8.19$, $p=0.00$) and 13% of older orphans ($\chi^2=5.27$, $p=0.02$) were without a change of clothes compared to 6% younger and 4% older non-orphans.

HIV Prevention Messages

A large proportion of both orphans and non-orphans received education about HIV prevention in school. There was a significant difference in exposure of HIV education in school among younger girls, whereby 86% of 12–15 year old orphans compared to 76% of 12–15 year old non-orphans received HIV messages ($\chi^2=4.42$, $p=0.04$). This trend was not consistent for the older age group, likely due to the fact that girls in general and orphans in particular were less likely to attend school at older ages. Of all ages, orphans reported attending educational programs within the community significantly more often than non-orphaned girls ($\chi^2=5.62$, $p=0.02$). Approximately 43% of younger orphans attended community programs compared to 31% of their non-orphaned counterparts ($\chi^2=5.43$, $p=0.02$), while community HIV program attendance was not significantly different between older orphans and non-orphans at 33% and 39% respectively ($\chi^2=0.75$, $p=0.39$).

When asked about HIV education and prevention activities in the past three months, data showed orphan girls reporting slightly lower rates of exposure to media-related sources such as posters, radio messages, and video. Amongst older girls only 68% of orphans saw a HIV prevention poster while 81% of non-orphans saw the same ($\chi^2=4.11$, $p=0.04$).

When asked about getting tested for HIV, 58% of younger orphans showed interest compared to 48% of younger non-orphans ($\chi^2=3.23$, $p=0.07$) with the gap in interest levels between orphans and non-orphans declining at older ages. Regardless of orphan status, older girls tended to be more interested in getting tested, ranging from 69–72%.

HIV Communication

When examining activities that included more intimate topics and/or settings, participation in prevention activities differed between age groups irrespective of orphan status. Regardless of orphan status, a greater percentage of girls attended talks about condoms at older ages with only 10–14% of 12–15 year old attending talks compared to 22–24% of 16–17 year olds. The same age-related trend was seen for HIV communication with 28–52% of older girls communication about HIV compared to only 12–31% of younger girls. Girls preferred to talk with a caregiver about HIV (36% of orphans and 38% of non-orphans) than talk with either a health worker (19% and 20% respectively) or a peer educator (27% for both groups). The data showed less caregiver-communication among orphans than non-orphans with a wider gap between older orphan and older non-orphan girls. Only 29% of 16–17 year old orphans and 42% of 16–17 year old non-orphans communicated with their caregiver about sex ($\chi^2=2.95$, $p=0.09$).

Discussion

Exposure to HIV Messages

With a 93% national school enrolment rate that is higher than all but one sub-Saharan country (Filmer and Ainsworth, 2002; Lloyd, Kaufman, & Hewett, 2000), the data suggests that HIV programs are clearly take advantage of the Zimbabwean school system's access to children for the delivery of HIV messaging. The majority of girls interviewed reported exposure to HIV education programs in school with the greatest discrepancy between the younger cohort of orphans and non-orphans. Orphaned girls aged 12–15 years reported significantly higher rates of exposure in school than non-orphaned girls despite lower rates of school attendance. This indicates that while programming is administered in schools, orphans may be more receptive to hearing HIV messages as a result of being directly affected by the disease. School-based and other programs need to find methods for more effectively conveying HIV prevention messages to younger non-orphan girls who are personally unaffected by HIV and, therefore, likely to be less attentive.

Overall, girls reported receiving HIV prevention messages in the community less often than at school. Among community-related HIV prevention sources, non-orphans reported higher rates of exposure to media-related sources. As suggested in the data, orphans are more likely to live in low-resource homes and possibly these households were less likely to have electronics such as radios and TVs, making media an ineffective delivery method for HIV information among orphans.

Levels of Motivation

Our study suggests that younger orphans were motivated to learn about HIV through community prevention activities while older orphans were likely to seek out one-on-one communication. Orphans' motivation may be driven by a desire to understand the epidemic which has directly impacted their lives through the death of a parent. Furthermore, the data implies orphans appeared more cognizant of HIV at earlier ages and are willing to test for HIV at higher proportions than non-orphans. While the questionnaire did not include questions on barriers to testing, it is possible that orphan girls felt more informed about HIV and as such harboured less fear of testing. Despite this higher baseline motivation among younger orphans, the data shows a smaller percent increase in HIV prevention activities and communication across age groups compared to non-orphans.

Caregiver Communication

Girls reported low rates of communication with caregivers about HIV and sex, with less frequency among orphans. This finding regarding communication may be because the mechanisms of communication are difficult to transverse for orphans and caregivers. Non-parental caregivers are likely less comfortable discussing sensitive topics such as sex and HIV with young girls. Intergenerational communication between grandparents and grandchildren is a particular challenge since older caregivers feel ill-equipped to discuss sexual behaviours and generationally-specific social situations (Boon, et al., 2009).

Studies indicate an association between orphans' living arrangements and psychosocial wellbeing whereby children living with non-relatives or grandparents fared more poorly than those living with a single surviving parent (Makame & Grantham-McGregor, 2002; Nyamukapa & Gregson, 2005; Ssengonzi, 2009). Adolescents with major life changes such as parental death often feel they lack control over their lives, resulting in feelings of hopelessness and isolation (Lefcourt, 1976; Overmier & Seligman, 1967; Richter, Foster, & Sherr, 2006; Makame & Grantham-McGregor, 2002). Further considerations for the communication gap among orphaned households include lower education among orphaned

heads of household (Foster, et al., 1995), unwanted adoption (Gilboron, 2002), and caregiver absenteeism (Heymann, Earle, Rajaraman, Miller, & Bogen, 2007).

Discussion of death is culturally taboo in much of Africa and is considered an inappropriate topic for children. When faced with the death of a parent, family members prefer to simply tell the child that the parent has “gone away” (Foster, et al., 1995; Posel, Kahn, & Walker, 2007; Wood, et al., 2006). In much of Africa AIDS-related deaths are handled with even more elusiveness due to societal association with moral deprivation and sexual promiscuity resulting in familial shame (Gagnon & Simon 1973; Plummer 1975; Setel, 1999). While strides have been made to de-stigmatize HIV, individuals still seldom acknowledge HIV as the cause of the death of a family member. This cultural practice of ignoring parental death does not protect children from living in an environment where HIV abounds. The data clearly suggests that orphans understand the impact of HIV and their personal risk for infection and are eager to learn about HIV prevention strategies at elevated rates than that of non-orphans. Improving caretaker’s knowledge and attitudes towards HIV will allow shared bereavement between caregiver and orphan, strengthening the bond between the two, and enabling open communication about HIV and sexual safety.

Conclusion

To our knowledge, this is the first study to compare orphan and non-orphan’s exposure to HIV messaging and caregiver communication, as well as exploring cohort variances in levels of motivation for learning about HIV. By understanding where girls receive education about HIV and who they rely on for information, organizations can effectively modify existing programs to better target this at-risk population.

There are several limitations to our study worth mentioning. The small sample size limited the statistic power of the analysis and may have underestimated the variation in exposure to HIV prevention between orphan and non-orphan. Furthermore, the results may have been subject to social desirability bias due to self-reporting and the sensitive nature of the survey questions.

Our overall findings show notable differences in exposure of HIV prevention messaging between younger orphans and non-orphans with statistical differences disappearing among older aged girls. Young orphans were eager to learn about HIV with many of these girls interested in learning their HIV status. In most cases, the data shows a greater exposure to HIV messaging among older non-orphan girls than all other cohorts. The lag in HIV prevention interest among older orphans is particularly concerning given that older adolescence is a period of sexually activity. Programs need to think critically about the driving forces responsible for waning HIV prevention motivation among 16–17 year old orphans and create innovative ways to re-engage them in HIV prevention in a way that is unique to their familial, educational, and social situations. While the school setting in Zimbabwe clearly provides a successful platform to teach girls about HIV and include prevention messages, school attendance rates drop among older girls making this setting less effective.

Prevention programs must target alternative venues within the community and among caretakers to ensure HIV messages reach older girls who are not enrolled in school, while concurrently making concerted efforts to improve school enrolment for this age group. Furthermore, HIV prevention efforts must contemplate innovate ways to make information accessible for orphans who are not exposed to common forms of media. Lastly, healthy sexual behaviour interventions must combine HIV information with skill building in order to produce sustained interest for older aged girls. More research needs to be done to understand

the orphan-caregiver relationship, as it is a particularly powerful avenue for teaching about HIV. In order for programs to effectively target caregivers as couriers of HIV prevention messages, researchers need to further uncover the existing barriers to discussing HIV apparent in this relationship. Establishing strong caregiver-orphan bonds will serve as protective mechanism against sexual risk-taking for orphans as they mature into a phase of sexual activity.

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Figure 1.
Orphan Status

Figure 2.
Household Head/Caregiver

Figure 3.
Percentage of girls in school by orphan status

Figure 4.
Percentage of girls in school by orphan status and age

Table 1
Comparison of socioeconomic situation and care practices by orphan status and age

	ORPHANS (n=216)		NON-ORPHANS (n=324)		TOTAL GIRLS n=540		12-15 YEAR OLD ORPHANS (n=133)		12-15 YEAR OLD NON-ORPHANS (n=207)		16-17 YEAR OLD ORPHANS (n=83)		16-17 YEAR OLD NON- ORPHANS (n=117)		TOTAL GIRLS 12-15 YEARS OLD (n=340)		TOTAL GIRLS 16-17 YEARS OLD (n=200)	
	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n
Socioeconomic Situation and Caring Practices																		
gone to bed hungry in the past month (always or sometimes) (X ² =1.84, df=1)																		
yes	21.5	46	16.82	54	100	22.73	30	18.45	38	19.51	16	13.91	16	32				
no	78.5	168	83.18	267	435	77.27	102	81.55	168	80.49	66	86.09	99	165				
had 3 or more meals in a day (X ² =2.14, df=1)																		
yes	77.1	165	82.24	264	429	74.24	98	82.04	169	81.71	67	82.61	95	162				
no	22.9	49	17.76	57	106	25.76	34	17.96	37	18.29	15	17.39	20	35				
has a change of clothes ^{***} (X ² =13.24, df=1)																		
yes	85.05 ^{**}	182	94.39 ^{**}	303	485	84.09 ^{**}	111	93.69 ^{**}	193	86.59 [*]	71	95.65 [*]	110	181				
no	14.95 ^{**}	32	5.61 ^{**}	18	50	15.91 ^{**}	21	6.31 ^{**}	13	13.41 [*]	11	4.35 [*]	5	16				

* $p<0.05$,

** $p<0.01$

Table 2

Comparison of HIV education and prevention activities by orphan status and age

	ORPHANS (n=216)				NON-ORPHANS (n=324)				TOTAL GIRLS n=540		12-15 YEAR OLD ORPHANS (n=133)		12-15 YEAR OLD NON- ORPHANS (n=207)		TOTAL GIRLS 12-15 YEARS OLD (n=340)		16-17 YEAR OLD ORPHANS (n=83)		16-17 YEAR OLD NON- ORPHANS (n=117)		TOTAL GIRLS 16-17 YEARS OLD (n=200)	
	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n
<i>HIV Education and Prevention Activities</i>																						
received education about HIV prevention in school * (X ² =2.39, df=1)																						
yes	84.11	180	78.75	252	432	85.61 *	113	76.21 *	157	81.71	270	83.33	67	83.33	95	162						
no	15.89	34	21.25	68	102	14.39 *	19	23.79 *	49	18.29	68	16.67	15	16.67	19	34						
attended an HIV educational program * (in the past 3 months) * (X ² =5.62, df=1)																						
yes	41.59 *	89	31.56 *	101	190	43.18 *	57	30.73 *	63	39.02	120	33.04	32	33.04	38	70						
no	58.41 *	125	68.44 *	219	344	56.82 *	75	69.27 *	142	60.98	217	66.96	50	66.96	77	127						
saw an HIV film or video (in the past 3 months) (X ² =0.26, df=1)																						
yes	34.11	73	36.25	116	189	30.3	40	32.2	66	40.24	106	43.48	33	43.48	50	83						
no	65.89	141	63.75	204	345	69.7	92	67.8	139	59.76	231	56.52	49	56.52	65	114						
heard an HIV program on radio (in the past 3 months) (X ² =0.36, df=1)																						
yes	42.52	91	45.14	144	235	38.64	51	42.16	86	48.78	137	50.43	40	50.43	58	98						
no	57.48	123	54.86	175	298	61.36	81	57.84	118	51.22	199	49.57	42	49.57	57	99						
saw an HIV prevention poster * (in the past 3 months) (X ² =0.29, df=1)																						
yes	64.95	139	67.19	215	354	62.88	83	59.51	122	68.29 *	205	80.87 *	56	80.87 *	93	149						

	ORPHANS (n=216)		NON-ORPHANS (n=324)		TOTAL GIRLS n=540		12-15 YEAR OLD ORPHANS (n=133)		12-15 YEAR OLD NON- ORPHANS (n=207)		TOTAL GIRLS 12-15 YEARS OLD (n=340)		16-17 YEAR OLD ORPHANS (n=83)		16-17 YEAR OLD NON- ORPHANS (n=117)		TOTAL GIRLS 16-17 YEARS OLD (n=200)	
	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n
no	35.05	75	32.81	105		180	37.12	49	40.49	83	132	31.71*	26	19.13*	22		48	
attended a talk on condoms (in the past 3 months) (X ² =0.37, df=1)																		
yes	17.29	37	15.31	49		86	14.39	19	10.24	21	40	21.95	18	24.35	28		46	
no	82.71	177	84.69	271		448	85.61	113	89.76	184	297	78.05	64	75.65	87		151	
interested in getting tested for HIV (X ² =3.29, df=1)																		
yes	63.33	133	55.38	175		308	58.14	75	48.04	98	173	71.6	58	68.75	77		135	
no	36.67	77	44.62	141		218	41.86	54	51.96	106	160	28.4	23	31.25	35		58	

* p<0.05,

** p<0.01

Table 3

Comparison of communication about sexual behavior by orphan status and age

	ORPHANS (n=216)		NON-ORPHANS (n=324)		TOTAL GIRLS n=540		12-15 YEAR OLD ORPHANS (n=133)		12-15 YEAR OLD NON-ORPHANS (n=207)		TOTAL GIRLS 12-15 YEARS OLD (n=340)		16-17 YEAR OLD ORPHANS (n=83)		16-17 YEAR OLD NON-ORPHANS (n=117)		TOTAL GIRLS 16-17 YEARS OLD (n=200)	
	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n
Communication about Sexual Behavior																		
talked about HIV/AIDS with a health worker (in the past 3 months) (X ² =0.14, df=1)																		
	yes	18.69	40	20	64	104	12.88	17	13.17	27	44	28.05	23	32.17	37	60		
no	81.31	174	80	256	430	87.12	115	86.83	178	293	71.95	59	67.83	78	137			
talked with peer educator (in the past 3 months) (X ² =0.00, df=1)																		
	yes	27.1	58	26.88	86	144	25.76	34	20.98	43	77	29.27	24	37.39	43	67		
no	72.9	156	73.12	234	390	74.24	98	79.02	162	260	70.73	58	62.61	72	130			
caregiver ever talked about sex (in the past 3 month) (X ² =1.10, df=1)																		
	yes	26.29	56	30.5	97	153	24.43	32	24.51	50	82	29.27	24	41.23	47	71		
no	73.71	157	69.5	221	368	75.57	99	75.49	154	253	70.73	58	58.77	67	125			
caregiver ever talked about HIV (in the past 3 months) (X ² =0.47, df=1)																		
	yes	35.51	76	38.44	123	199	28.79	38	30.73	63	101	46.34	38	52.17	60	98		
no	64.49	138	61.56	197	335	71.21	94	69.27	142	236	53.66	44	47.83	55	99			

* $p<0.05$,** $p<0.01$