



The Open Public Health Journal

Content list available at: www.benthamopen.com/TOPHJ/

DOI: 10.2174/1874944501811010275



RESEARCH ARTICLE

HIV Testing Among Women of Reproductive Age Exposed to Intimate Partner Violence in Uganda

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Received: February 19, 2018

Revised: May 29, 2018

Accepted: May 31, 2018

Abstract:

Background:

Intimate Partner Violence (IPV) and Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome (HIV/AIDS) occur as dual epidemics with gender dimensions. IPV sometimes result in lack of decision making autonomy over one's own health and this may negatively affect uptake HIV testing services.

Objective:

The study aimed to examine the association between exposure to IPV and HIV testing among women of reproductive age in Uganda.

Method:

The study is based on cross-sectional data from 2011 Uganda Demographic and Health Survey (UDHS). A sub-sample of 1705 ever-partnered women aged 15-49 who responded to the domestic violence module was examined in the study. Bivariate and multivariable (logistic regression) analyses were used to determine the association between exposure to IPV and HIV testing.

Results:

Up to 82.3% and 61.5% of the respondents were tested for HIV ever and in the past year, respectively. The prevalence of physical IPV and IPV of any form in the past year was 25.6% and 44% respectively. Exposure to physical IPV and emotional IPV in the past year was associated with HIV testing within the past year. In the multivariate analysis, exposure to physical IPV remained significantly associated with HIV testing within the past year (OR: 1.34; 95% CI: 1.03-1.73). Frequent access to newspapers remained a significant predictor of HIV testing uptake.

Conclusion:

HIV testing in the past year is associated with exposure to IPV among women of reproductive age in Uganda. There is a need to include IPV as a part of global strategy to address HIV/AIDS.

Keywords: HIV/AIDS, HIV testing, Intimate Partner Violence, Women, Uganda, Physical IPV, Emotional IPV.

1. INTRODUCTION

Intimate Partner Violence against women (IPV), refers to behaviours within an intimate relationship that causes physical, emotional, or sexual harm to a partner [1]. About 1 in 3 women have experienced physical or sexual intimate

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partner violence or both in their lifetime [2]. IPV is a risk factor for injuries, mental health problems, homicide [3], sexually transmitted diseases including Human Immunodeficiency Virus, HIV [4]. Increased susceptibility to HIV is related to differential access to health services and gender inequalities [5, 6]. Studies show that abusive partners are likely to engage in risky sexual behaviors that predispose women to IPV [7] and that abused women face difficulty in negotiating for safer sex such as condom use [8].

Thus screening for HIV and uptake of HIV testing are therefore important especially for women exposed to IPV. Existing screening strategies like the Joint United Nations Programme on HIV/AIDS 90-90-90 strategy (UNAIDS 90-90-90) aims to identify and retain HIV positive individuals in care. The goal of UNAIDS 90-90-90 is that by 2020 at least 90% of people living with HIV should know their status, 90% of those diagnosed should be placed on antiretroviral treatment and finally, 90% of those in treatment attain fully suppressed viral load [8b]. IPV and HIV are global health challenges with gender dimensions, therefore understanding the relationship between IPV and uptake of HIV testing services is important. Few studies have explored the relationship between IPV and HIV testing with varying results, *e.g.* less HIV testing among women exposed to IPV [9], or increased testing among women experiencing IPV [10], *versus* no significant associations between IPV and HIV testing [11]. A recent review of studies from sub-Saharan Africa found that gender inequalities undermine women's decision making autonomy about HIV testing [12].

2. STUDY CONTEXT: IPV AND HIV IN UGANDA

Global strategies to address public health problems require an understanding of these problems within specific contexts. Uganda is a country with dual IPV and HIV epidemic. Yearly prevalence of IPV is 14% to 33% [13, 14], while lifetime prevalence lies between 44.9% and 54% [13, 15]. There has been a steady decrease in a number of new infections however women remain disproportionately affected [16]. Testing approaches in Uganda are in line with recommendations of the World Health Organisation (WHO), namely, Voluntary Counseling and Testing (VCT) and Provider Initiated Testing and Counselling (PITC). VCT is at the initiative of the client while PITC is an approach in which health care workers recommend testing for patients attending health facilities [17]. Awareness creation for voluntary testing in Uganda is through education and information dissemination by different media communications outlets [17b].

Though there are studies from Uganda showing the association between IPV and heightened risk for HIV infection among women, not much is known about the relationship between IPV and HIV testing. There is thus a need for empirical studies examining the relationship between IPV and actual uptake of HIV testing among women exposed to IPV.

3. THEORETICAL FRAMEWORK

3.1. Theory of Reasoned Action (TRA)

The choice to use TRA is based on its relevance for the outcome variable *i.e.* voluntary HIV. TRA developed by Martin Fishbein and Icek Ajzen is a popular theory for understanding voluntary behaviors among individuals [18]. Three conditions influence the relationship between behavioural intention and performance of the intended behaviour. First is that behavioural intention must be specific, secondly, the intention should be stable and lastly is that the performance of the behaviour depends on the extent to which the execution of the intention is under the volitional control of the individual. Irrespective of whether testing is VCT or PITC, voluntariness and willingness to take a test are required. A level of reasoning and evaluation of the consequences of screening definitely occurs in the minds of women experiencing IPV while they are considering VCT or when PITC is suggested to them. Factors associated with testing uptake will be discussed within the framework of TRA.

The ecological model is often applied when multiple factors are to be considered.

3.1.1. The Social Ecological Model (SEM)

Has been used in understanding HIV prevention, behavior and AIDS care [19]. Whereas individuals are responsible for initiating and maintaining lifestyle changes necessary to reduce risk and promote health, an individual's behavior is also influenced by other factors categorized into five nested hierarchical levels, *i.e.* Individual, Interpersonal, Organisational, Community, and Policy levels. Individual-level factors include gender, age, attitude, access to information *etc.* The interpersonal level is social influence from an intimate partner, friends, and family, IPV, *etc.*

Organisation level factors include the availability of testing opportunities through VCT/PITC, information, *etc.* Factors at the community level include cultural and religious norms *etc.* The policy is the final level and includes global, national laws regarding HIV testing, access to resources *etc.*

A similar model is also used to explain IPV, comprising four major levels, *i.e.* individual, relationship, community and societal [20]. Individual-level includes factors like gender, age, education, attitudes towards IPV *etc.* At the second level, factors are related to closest social circle that can shape behavior and experiences. The third level *i.e.* community level explores community contexts in which social relationships are embedded and associated with IPV victimization or perpetration. The fourth level describes broader, macro-level factors that influence IPV, such as gender inequality, religious or cultural belief systems *etc.*

4. AIM

The aim of this study is to examine the association between exposure to IPV and HIV testing including associated factors among women of reproductive age in Uganda.

4.1. Research Questions

1. Is there any association between IPV and HIV testing among women of reproductive age in Uganda and what is the direction of association if so?
2. What is the role of other factors in the relationship between IPV and HIV testing?

5. METHODS

The current study is based on data from the 2011 Uganda Demographic and Health Survey, UDHS 2011 [21]. DHS is funded by the United States Agency for International Development (USAID) and are nationally representative household surveys providing data regarding population health, and nutrition.

5.1. Study Design of the UDHS 2011

The 2011 UDHS is a cross-sectional study of 10086 nationally representative households selected using two-stage cluster sampling procedure. In the first stage, 404 Enumeration Areas (EAs) were selected from a list of clusters sampled for the 2009/10 Uganda National Household Survey. In the second stage, households in each cluster were purposively selected from a complete listing of households from the 404 EAs. Structured and comprehensive questionnaires were administered to eligible participants covering areas such as demographic characteristics, health care services, knowledge about HIV and AIDS and domestic violence. One woman or man per household between the ages of 15 and 49 years was randomly selected for the domestic violence module. Randomisation was done by integrating a simple selection procedure based on the Kish Grid into the Household Questionnaire [21]. For purposes of this study, only ever-partnered women who responded to the domestic violence module were included, giving rise to a total of 1,705 women between the ages of 15 and 49 years.

5.2. Measures Used in The Study

5.2.1. Dependent Variables

Lifetime and past year HIV testing were assessed using the questions 'Ever tested for HIV', and 'Tested within the past year'. A binary response 'Yes' or 'No' was recorded for both variables.

5.2.2. Independent Variables

Lifetime and past year exposure to IPV was measured using the modified and validated version of the Conflict Tactic Scale by Strauss, 1990 [22]. The examined forms of IPV were operationalized as follows: Physical IPV: Pushing, shaking, slapping, pulling hair; punching, kicking/dragging *etc.* Sexual abuse: forced sexual intercourse or other sexual acts. Emotional abuse: humiliation by a partner in front of others, threatening to harm someone close to the woman *etc.* Any IPV: experiencing at least one form of the forementioned types of IPV. Composite variables were created to assess exposure to any of the types of IPV ever in life and within the past year. Other independent variables include age, religion (catholic, protestant, muslim or pentecostal); type of residence (Urban or rural); wealth index (*i.e.* poor, middle or rich and is based on possession of assets *e.g.* bicycle *etc.*, within the household); level of education (*i.e.* no

education, primary, secondary or higher); access to information (operationalised as frequency of reading news papers, watching television or listening to radio, responses include not at all, sometimes and almost everyday); level of decision making (operationalised as being involved or not involved in important decision making and in matters concerning the women or the household); and attitudes towards IPV were dichotomised into accepted and not accepted. Attitudes to IPV were operationalized as whether or not respondent justifies IPV in hypothetical situations like when she burns food, neglects children, goes out without telling her husband *etc.*

5.2.3. Ethical Consideration

Demographic and Health Surveys (DHS) are conducted in strict adherence to ethical recommendations for researching violence against women such as training and support of field workers, voluntary participation, obtaining informed consent from respondents as well as ensuring privacy and confidentiality [23]. Approval for the 2011 UDHS was granted by the Institutional Review Board of Macro International, an institution responsible for ethics and providing technical assistance for conducting demographic and health surveys. Permission to use 2011 UDHS data for this paper was granted by the DHS.

5.2.4. Statistical Analysis

Data were analyzed using the SPSS program version 23.0. Descriptive statistics were used to examine participants' characteristics, bivariate analysis was done to study the association between the independent IPV and the outcome variables *i.e.* life time and past year HIV testing. Associations between HIV testing and IPV were expressed as chi square. Variables significant at 90% CI were included in the logistic regression with statistical significance at $p < 0.05$. Results are presented as adjusted Odds Ratios (OR) and Confidence Intervals (CI). For the multivariate analysis, variables were included in the regressions models block by block. For the relationship between lifetime exposure to IPV and ever testing for IPV, four models were built. In model 1, lifetime exposure to physical violence and ever testing for HIV was studied. In model 2, demographic factors were controlled for, socioeconomic factors were included and adjusted in model 3 while empowerment factors were included in model 4. Two models were built for the relationship between exposure to IPV in the past year and having tested for HIV in the past year. The first model includes the relationship between IPV and HIV while access to information was adjusted in model 2.

6. RESULTS

6.1. Characteristics of Women Selected for The Study

As seen in Table 1, the prevalence of lifetime physical IPV and IPV of any form was 25.6% and 56.1% respectively while the prevalence of physical IPV and IPV of any form in the past year was 25.6% and 44% respectively. Up to 82.3% of respondents had ever been tested for HIV, 61.5% tested for HIV in the past 12 months. Majority of the women were aged 25 – 34 years. About three-quarters of the participants did not read newspapers, the same proportion was rural dwellers.

Table 1. Characteristics of participants

Variable	Frequency	Percentage
Age		
15-24	474	27.8
25-34	689	40.4
35-44	408	23.9
45-49	134	7.9
Religion		
Catholic	734	43.0
Protestant	475	27.9
Muslim	241	14.1
Pentecostal	216	12.7
Other	39	2.3
Type of place of residence		
Urban	421	24.7
Rural	1284	75.3

(Table 1) contd.....

Variable	Frequency	Percentage
Wealth index		
Poor	719	42.2
Middle	280	16.4
Rich	706	41.4
Employment		
Not working	433	25.4
Working	1272	74.6
Education		
No education	328	19.2
Primary	985	57.8
Secondary and Higher	392	23.0
Frequency reading news papers		
Not at all	1290	75.8
Sometimes	350	20.6
Almost everyday	61	3.6
The frequency of listening to the radio		
Not at all	16.3	27.9
Sometimes	475	55.7
Almost everyday	950	55.7
The frequency of watching television		
Not at all	1207	70.8
Sometimes	308	18.1
Almost everyday	190	11.1
Decision making		
Not involved	151	8.9
Involved	1295	76.0
Attitudes towards wife beating		
Not Accepted	720	42.2
Accepted	981	57.5
Ever experienced emotional IPV		
no	1002	58.8
yes	702	41.2
Ever experienced physical IPV		
no	999	58.6
yes	700	41.1
Ever experienced sexual IPV		
no	1240	72.7
yes	436	25.6
Ever experienced any IPV		
no	719	42.2
yes	956	56.1
Emotional IPV past year		
No	1164	68.3
Yes	540	31.7
Physical IPV Past year		
no	1262	74.0
yes	437	25.6
Sexual IPV Past Year		
no	1329	77.9
yes	347	20.4
Any IPV past year		
no	952	56.0
yes	747	44.0
Tested for HIV in the past 12 months		

(Table 1) contd....

Variable	Frequency	Percentage
no	540	38.5
yes	863	61.5
Ever been tested for HIV		
No	300	17.6
Yes	1404	82.3

6.2. Bivariate Analysis on Women's HIV Testing and Exposure to IPV

In Table 2, significant proportion of women experiencing physical IPV ever tested for HIV (83%) compared to women never exposed to physical abuse ($\chi^2(1) = 3.2$; $P < 0.1$). Similarly, exposure to physical IPV (66.1%), emotional (64.7%) and any form of IPV (65.1%) within the past year was significantly associated with HIV testing within the same period, ($\chi^2(1) = 4.5$; $P < 0.05$); ($\chi^2(1) = 2.7$; $P < 0.1$) and ($\chi^2(1) = 5.8$; $P < 0.05$) respectively.

Table 2. Association between exposure to IPV and HIV testing.

Variable	Ever been tested for HIV			Tested for HIV in the past year		
	N	%age	P-Value	N	%age	P-Value
<i>Emotional IPV Ever</i>			0.34			-
Yes	1001	83.1		-	-	
No	702	81.3		-	-	
<i>Physical IPV Ever</i>			0.08			-
Yes	998	83.8		-	-	
No	700	80.4		-	-	
<i>Sexual IPV Ever</i>			0.68			-
Yes	1239	82.2		-	-	
No	436	83.0		-	-	
<i>Any IPV Ever</i>			0.33			-
Yes	718	83.4		-	-	
No	956	81.6		-	-	
<i>Emotional IPV past year</i>			-			0.10
Yes	-	-		436	64.7	
No	-	-		966	60.0	
<i>Physical IPV past year</i>			-			0.03
Yes	-	-		359	66.3	
No	-	-		1039	60.0	
<i>Sexual IPV past year</i>			-			0.23
Yes	-	-		275	65.1	
No	-	-		1105	61.2	
<i>Any IPV Past year</i>			-			0.02
Yes	-	-		610	65.1	
No	-	-		788	58.8	

%age- Percentage of respondents who tested for HIV - Not Applicable

6.3. Women's Demographic, Socio-Economic and Empowerment Characteristics, and HIV Testing

In Table 3, being in the age group 15 – 24 ($\chi^2(3) = 44.5$; $P < 0.001$), living in urban areas ($\chi^2(1) = 25.3$; $P < 0.001$) and frequent access to newspapers ($\chi^2(2) = 20.0$; $P < 0.001$), radio ($\chi^2(2) = 16.5$; $P < 0.001$) and television ($\chi^2(2) = 21.5$; $P < 0.001$) were significantly associated with ever testing for HIV. Women with frequent access to newspapers ($\chi^2(2) = 6.528$; $P < 0.05$) and radio ($\chi^2(2) = 5.6$; $P < 0.1$) were tested more within the past year. Interestingly, HIV testing in the past year was more among women who did not watch television at all compared to those who watched television more frequently ($\chi^2(2) = 8.6$; $P < 0.05$).

Table 3. Bivariate analysis on demographic, socio-economic and empowerment factors, and HIV testing ever and in the past year.

Variable	Ever Been Tested for HIV			Tested For HIV in The Past Year		
	N	%	P-Value	N	%	P-Value
<i>Age</i>			<0.01			0.58

(Table 3) contd.....

Variable	Ever Been Tested for HIV			Tested For HIV in The Past Year		
	N	%	P-Value	N	%	P-Value
15-24	473	86.7		393	63.1	
25-34	689	85.9		565	59.3	
35-44	408	76.7		333	63.1	
45-49	134	66.4		112	62.5	
<i>Religion</i>			0.54			0.29
Catholic	733	80.9		599	61.4	
Protestant	475	83.2		402	65.2	
Muslim	241	82.2		195	57.4	
Pentecostal	216	85.2		175	59.4	
Other	39	87.2		32	53.1	
<i>Type of place of residence</i>			<0.01			0.81
Urban	421	90.5		351	61.0	
Rural	1283	79.7		1052	61.7	
<i>Wealth index</i>			<0.01			0.34
Poor	719	77.1		586	61.3	
Middle	279	83.9		222	65.8	
Rich	706	87.3		595	60.2	
<i>Employment</i>			0.14			0.73
Not working	433	84.8		358	62.3	
Working	1271	81.6		1045	61.2	
<i>Education</i>			<0.01			0.22
No education	328	66.2		277	57.4	
Primary	984	83.8		792	63.3	
Secondary and Higher	392	92.3		334	60.8	
<i>Frequency reading newspapers</i>			<0.01			0.04
Not at all	1289	80.1		1054	61.8	
Sometimes	350	88.9		296	58.4	
Almost everyday	61	93.9		49	77.6	
<i>The frequency of listening to the radio</i>			<0.01			0.06
Not at all	278	80.6		225	63.1	
Sometimes	475	77.1		389	56.6	
Almost everyday	949	85.6		787	63.5	
<i>The frequency of watching television</i>			<0.01			0.01
Not at all	1206	82.1		991	63.5	
Sometimes	308	76.9		251	53.4	
Almost everyday	190	93.2		161	62.1	
<i>Decision making</i>			0.30			0.93
Not involved	151	79.5		118	60.2	
Involved	1294	82.8		1068	60.6	
<i>Attitudes towards wife beating</i>			0.28			0.30
Not Accepted	719	83.6		619	63.0	
Accepted	981	81.5		783	60.3	

%. Percentage of respondents who tested for HIV

6.4. Multivariate Analysis on Women's Exposure to IPV and HIV Testing

In Table 4, factors independently associated with ever testing for HIV in relation to IPV are presented in four models. In mode 1, having ever been exposed to physical IPV was not significantly associated with ever testing for HIV. No statistically significant relationship between HIV testing ever and IPV was ever found after successively adjusting for demographic, socio-economic and empowerment factors in models 2, 3 and 4 respectively, However, age, type of residence and education remained significantly associated with HIV testing.

Table 4. Multivariate analysis for women's life time exposure to IPV and ever testing for HIV.

Variable	Model 1 (r2 = 0.003)		Model 2 (r2 =0.065)		Model 3 (r2 =0.111)		Model 4 (r2 =0.118)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
<i>Ever experienced physical IPV</i>								
No	1.00		1.12		1.00		1.00	
Yes	1.26	(0.977-1.615)		(0.87-1.45)	1.04	(0.79-1.35)	1.04	(0.80-1.36)
<i>Age</i>								
15-24			3.01	(1.92-4.74) ***	2.50	(1.56-3.99) ***	2.60	(1.62-4.18) ***
25-34			2.82	(1.84-4.30) ***	2.60	(1.66-3.99) ***	2.70	(1.70-4.12) ***
35-44			1.52	(0.98-2.34) ***	1.51	(0.97-2.36)	1.52	(0.97-2.40)
45-49			1.00		1.00		1.00	
<i>Place of residence</i>								
Urban			2.40	(1.68-3.45) ***	1.71	(1.13-2.36) **	1.64	(1.06-2.53) **
Rural			1.00		1.00		1.00	
<i>Wealth index</i>								
Poor					0.89	(0.63-1.28)	0.98	(0.68-1.41)
Middle					1.11	(0.72-1.70)	1.12	(0.73-1.74)
Rich					1.00		1.00	
<i>Education</i>								
No education					0.25	(0.15-0.42) ***	0.30	(0.18-0.52) ***
Primary					0.57	(0.37-0.89) **	0.61	(0.38-0.97) **
Secondary and Higher					1.00		1.00	
<i>Frequency reading news papers</i>								
Not at all							0.69	(0.23-2.06)
Sometimes							0.76	(0.26-2.29)
Almost everyday							1.00	
<i>The frequency of listening to the radio</i>								
Not at all							0.90	(0.62-1.31)
Sometimes							0.80	(0.58-1.08)
Almost everyday							1.00	
<i>The frequency of watching television</i>								
Not at all							0.80	(0.58-1.08)
Sometimes							0.60	(0.30-1.20)
Almost everyday							1.00	

*p<0.05, **p<0.01, ***p<0.001 OR-Odds Ratio CI-Confidence Interval

As shown in Table 5, HIV testing in the past year remained significantly associated with exposure to physical IPV and any form of IPV for the same period in both models below, even after adjusting for access to information factors. Women who read newspapers almost every day had two times higher odds of testing as compared to women who read newspapers less often.

Table 5. Multivariate analysis for women's exposure to IPV and HIV testing within the past year.

Variable	Model 1 (r2 = 0.003)		Model 2 (r2 = 0.020)	
	OR	(95% CI)	OR	(95% CI)
<i>Experienced emotional IPV in the past year</i>				
No	1.00		1.00	
Yes	1.22	(0.96-1.54)	1.21	(0.95-1.53)
<i>Frequency reading news papers</i>				
Not at all			1.00	
Sometimes			0.93	(0.71-1.23)
Almost everyday			2.32	(1.14-4.72) **
<i>The frequency of listening to the radio</i>				
Not at all			1.00	

(Table 5) contd.....

Variable	Model 1 (r ² = 0.003)		Model 2 (r ² = 0.020)	
	OR	(95% CI)	OR	(95% CI)
Sometimes			0.84	(0.60-1.20)
Almost everyday			1.05	(0.77-1.44)
<i>The frequency of watching television</i>				
Not at all			1.00	
Sometimes			0.69	(0.51-0.92)
Almost everyday			0.90	(0.62-1.32)
Variable	Model 1 (r ² = 0.003)		Model 2 (r ² = 0.020)	
	OR	(95% CI)	OR	(95% CI)
<i>Experienced physical IPV in the past year</i>				
No	1.00		1.00	
Yes	1.30	(1.01-1.68) **	1.34	(1.04-1.73) **
<i>Frequency reading news papers</i>				
Not at all			1.00	
Sometimes			0.94	(0.71-1.24)
Almost everyday			2.37	(1.16-4.8) **
<i>Frequency of listening to radio</i>				
Not at all			1.00	
Sometimes			0.86	(0.61-1.22)
Almost everyday			1.08	(0.79-1.50)
<i>Frequency of watching television</i>				
Not at all			1.00	
Sometimes			0.683	(0.51-0.92)
Almost everyday			0.91	(0.62-1.32)
Variable	Model 1 (r ² = 0.003)		Model 2 (r ² = 0.020)	
	OR	(95% CI)	OR	(95% CI)
<i>Experienced any IPV in the past year</i>				
No	1.00		1.00	
Yes	1.31	(1.05-1.63) **	1.31	(1.05-1.64) **
<i>Frequency reading news papers</i>				
Not at all			1.00	
Sometimes			0.94	(0.71-1.24)
Almost everyday			2.34	(1.15-4.78) **
<i>The frequency of listening to the radio</i>				
Not at all			1.00	
Sometimes			0.84	(0.59-1.20)
Almost everyday			1.64	(0.76-1.43)
<i>The frequency of watching television</i>				
Not at all			1.00	
Sometimes			0.69	(0.52-0.93)
Almost everyday			0.91	(0.629-1.34)

*p<0.05, **p<0.01, ***p<0.001 OR-Odds Ratio CI-Confidence Interval

7. DISCUSSION

This study assessed the association between exposure to IPV and HIV testing among women of reproductive age in Uganda. About 25.6% and 44% of respondents had experienced physical IPV and any form of IPV respectively. About 61.5% had tested for HIV in the past year. Women exposed to physical IPV and any forms of IPV in the past year were significantly more likely to have tested for HIV in the past year. Lifetime exposure to IPV was not independently associated with having ever taken HIV test. The adjusted analysis indicates that age and type of place of residence were significantly associated with ever testing for HIV. Reading newspapers remained consistently significant for HIV testing in the past year.

The finding that women experiencing physical IPV ever and in the past year are likely to have tested for HIV, is consistent with some previous studies [10] but contrasts to findings from a Ugandan study which found no significant association between IPV and HIV [11]. It should, however, be noted that the population in the aforementioned study was pregnant women attending antenatal care [11]. Although education and access to information through newspaper were significantly associated with “Ever testing”, only access to information through reading newspapers was significant for testing in the past year. While it can be argued that educated people have more access to information through newspaper, television and the radio. Our findings show that only access to information through newspaper is significant for testing in the past year, not education. Though the reasons for the foregoing are not clear, it is likely that compared to films and television programmes, newspapers are probably less often used to promote the norms that reinforce patriarchal practices and gender inequalities [24]. Previous studies highlighting the effective use of newspapers to combat HIV/AIDS in Uganda seem to corroborate our findings [24b, 25].

7.1. Discussion of Findings in Relation to the Theory of Reasoned Action (TRA)

According to TRA, the intention to carry out a given behavior (*i.e.* behavioral intention) always precedes the behavior. With regards to testing for HIV among women exposed to IPV, women’s specific intention to test may be propelled by multiple reasons. For example, it is likely that women experiencing physical IPV already understand that they face a high risk of HIV infection from abusive partners thus strengthening the resolve (specific intention) to be tested (*e.g.* VCT) or seize the opportunity when offered (*e.g.* PITC). Studies show that norms seemingly encouraging male unfaithfulness and difficulty negotiating safe sex within marriage actually limit women’s agency over own sex life and health [7, 8, 26]. Thus awareness of HIV risks due to the foregoing may be one of the factors that generate specific intention to test or to seize the opportunity for testing when offered. This fulfills the first condition of the TRA.

It is likely that over time, individuals within their communities are able to make the connection between, IPV, marital unfaithfulness, and HIV as they see or hear about people who have become infected or died from the disease. Therefore exposure to IPV becomes a catalyst for specific intent to get tested for HIV and eventually translates to actual testing. Another factor likely to result in specific intention is women’s sense of responsibility to protect their children as seen especially among pregnant women experiencing IPV [26]. This perceived risk may also induce fear for their health, a threat to their mental wellbeing.

In this study, it was observed that the likelihood of HIV testing was higher among women who read newspapers every day than those who did not. It is possible that the resolve to voluntarily test for HIV (VCT) or the willingness to accept PITC was regularly strengthened and stabilized among women consistently experiencing IPV but accessing information regarding HIV/AIDS in newspapers. This seems to fit the second condition of TRA *i.e.* stability of intention.

The third condition in TRA is the extent to which the execution of the intention is under the volitional control of the individual. Although norms might mean less agency among women, findings from this study show that women exposed to IPV in Uganda test for HIV are probably due to the design of VCT and PITC *i.e.* confidentiality, counseling and information regarding disclosure. The design and structure of HIV testing programmes thus empower women exposed to IPV to get tested without the risk of further exposure to IPV. This finding has implications for IPV as it further confirms the role of the healthcare sector as an important arena for HIV and even IPV screening. Furthermore, the approach used to improve HIV testing for example, increased and intensive awareness campaign and confidentiality testing *etc.*, may be effectively adopted to address IPV.

No statistical significance between lifetime exposure to IPV and ever testing for HIV was observed in the current study. This is consistent with those from other African settings such as [11].

7.2. Discussion of Findings in Relation to the SEM

The nested nature of the model demonstrates how factors at one level can influence factors at another level. According to our findings, age and level of education assessed under individual factors were important for having ever taken an HIV test. Being below 35 years was associated with higher likelihood of HIV testing in the past year, this could be explained by the availability of programs (organizational and policy levels) *e.g.* antenatal screening youth clinics [27]. Since this is the more reproductively active age group, women below the age of 35 are more likely to have access to health facilities where PITC is offered. Also, increased tendency to test among women below 35 years may be due to perceived risk owing to an active sexual life.

Educated women were more likely to test for HIV probably due to increased knowledge, awareness, access to information and positive attitudes towards making healthy lifestyle choices like taking an HIV test. Type of residence among the SEM levels is discussed at the community level and the difference in testing rates (*i.e.* more in urban), could be explained by availability and easier access to testing services in the urban areas compared to rural settings.

Access to HIV information is related to how information is packaged and disseminated (organizational and policy levels) as well as individual level factors like education which enhance access. This can be seen in the association between newspaper reading and testing for HIV seen in this study. The interpersonal level of the SEM shows how intimate relationships can affect an individual's health behaviour. Exposure to IPV of any form was associated with a higher likelihood of testing for HIV among women within the past year. IPV could exist in a society due to cultural norms but it happens at the relationship level. Increased HIV testing among IPV victims is probably an indication of their perceived risk of infection.

8. STRENGTHS AND LIMITATIONS

The cross-sectional nature of the DHS data rules out causality. The data is based on self-reports hence the possibility of socially desirable answers and recall bias cannot be ruled out especially because IPV and HIV are sensitive topics. Some strengths are however worth mentioning, for example, the UDHS 2011 data is nationally representative and collected in strict adherence to WHO standards of researching violence against women [23]. Additionally, analysis on exposure to IPV and HIV testing was done to match same time periods (*i.e.* HIV testing ever versus IPV ever and HIV testing past year versus IPV past year).

CONCLUSION AND RECOMMENDATIONS

IPV and HIV testing are issues of global health concern whose relationship can vary in different contexts. The relationship between access to newspaper information may have important bearing for policy and practice regarding information dissemination. This may especially be true given that the effective role of the print media in raising awareness about HIV/AIDS in Uganda has been previously reported elsewhere [24b]. Increased testing among women exposed to IPV is a clear indication of abused women's perceived risk and fear for their health, a subtle threat to mental well being. Although confidentiality and counseling seemingly give women agency to test, testing does not guarantee entering into HIV management for those testing positive. Knowledge about one's status requires efforts to remain healthy (for those who test negative) or to start and remain in treatment (for those who test positive). Both options may be difficult for women experiencing IPV. There is thus a need to integrate IPV related interventions into HIV testing and care as part of the global strategy to combat HIV. Furthermore, studies using more recent data are warranted in order to see current trends and any changes in the relationship between IPV and HIV testing among women of reproductive age in Uganda.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Demographic and Health Surveys (DHS) are conducted in strict adherence to ethical recommendations for researching violence against women such as training and support of field workers. Approval for the 2011 UDHS was granted by the Institutional Review Board of Macro International, an institution responsible for ethics and providing technical assistance for conducting demographic and health surveys. Permission to use 2011 UDHS data for this paper was granted by the DHS.

HUMAN AND ANIMAL RIGHTS

No animals/ humans were used for studies that are bases of this research.

CONSENT FOR PUBLICATION

Informed written consent was obtained from all the participants.

CONFLICT OF INTEREST

Auhors declare no conflict of interest, financial or otherwise.

ACKNOWLEDGEMENTS

The authors wish to thank the Demographic and Health Survey Programme (DHS) for permission to use the UDHS

2011 data. All authors have contributed equally to the study.

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