

Prevalence and associated outcomes of Intimate Partner Violence (IPV) among women
with HIV in Rwanda

by

Sandy Hatoum

Duke Global Health Institute
Duke University

Date: _____

Approved:

Michael Relf, Supervisor

Eric Green

Donatilla Mukamana

Thesis submitted in partial fulfillment of
the requirements for the degree of Master of Science
in the Duke Global Health Institute
in the Graduate School
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2023

ABSTRACT

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Abstract

Background: Intimate partner violence is a preventable public health problem that disproportionality impacts women in Sub-Saharan Africa. Women with HIV have a higher burden due to HIV related stigma they may face. In Rwanda, women have higher incidences of HIV and intimate partner violence. This study aimed to estimate the prevalence of IPV among women living with HIV in Rwanda as well as measure the difference in psychological outcomes, demographic data, and HIV related outcomes.

Methods: This study conducts a secondary data analysis of a Cross-sectional, descriptive observational study. 162 Rwandan women living with HIV were purposefully recruited to participate in the survey. The instrument measured demographic data, Intimate partner violence, depression , HIV related stigma , coping , self-esteem, and hope.

Results: The prevalence of IPV in the sample was 26.61% with psychological being the most prevalent followed by physical then sexual. Demographic data had no statistical significance with the prevalence of IPV. Women with HIV who experienced IPV had higher HIV stigma , lower coping self-efficacy , lower self-esteem , and less hope levels.

Conclusions: Women who experience IPV have worse HIV psychological outcomes which could lead to decreased overall health outcomes. Further studies are needed to look into the correlation between the two as well as interventions addressing IPV prevention and awareness.

Dedication

I dedicate this to my family who never stop supporting me and believing in me.

To my mother who remains the strongest, kindest, most loving woman, your many sacrifices are the reason for every success, and I owe everything I am today to you.

Finally, I would like to dedicate this to the people of Rwanda who welcomed me with so much love and respect. Your resilience and courage are inspiring.

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1. Introduction

Intimate partner violence (IPV), sometimes referred to as domestic violence in the literature, is a common preventable public health problem (Association of Women’s Health, Obstetric and Neonatal Nurses, 2019). Women bear a higher burden of intimate partner violence (IPV) as it is considered to be the most common form of violence against women (Devries et al., 2013; Dunkle & Decker, 2013). IPV includes physical, sexual, and emotional (psychological) abuse frequently accompanied with controlling behaviors by a current or former intimate partner, to include current or former spouses, boyfriends/girlfriends, dating partners, or sexual partners. (Devries et al., 2013; Dunkle & Decker, 2013), Breiding et al., n.d.; Yakubovich et al., 2018). The terminologies to describe the types of violence vary in the literature; however, in a report released by WHO in 2012 (WHO, 2012, Understanding and addressing violence against women), they provided a description for the different types of violence as follows:

Table 1: Definitions of different IPV types as per WHO

Type of IPV	Definition
Physical	Slapping, hitting, kicking, and beating
Sexual	Forced sexual intercourse and other forms of sexual coercion

Emotional (Psychological)	insults, belittling, constant humiliation, intimidation (e.g., destroying things), threats of harm, threats to take away children
Controlling Behaviors	isolating a person from family and friends; monitoring their movements; and restricting access to financial resources, employment, education, or medical care.

Source: WHO, 2012.

Different forms of IPV commonly coexist; frequently, physical violence is followed by or co-occurs with sexual violence and emotional abuse (*Violence against Women*, n.d.). The accurate prevalence of intimate partner violence is difficult to determine due to the high levels of stigma surrounding it, which is associated with underreporting. Additionally, due to the intimate nature of the relationship and laws related to IPV, underreporting may further be inhibited. In many countries, IPV is considered to be a private matter of the home leading victims and survivors to not disclose their experiences (García-Moreno et al., 2015). Diminished reporting can also be attributed to stigma from the community or sociocultural norms which tolerate violence against women (Christopher et al., 2022).

It is estimated that one in three women worldwide (30%) experience IPV during their lifetime. However, other research places the lifetime experience of IPV among women to be between 22% and 38% range worldwide (Sardinha et al., 2022; Sugg, 2015; Yakubovich et al., 2018). Sardinha and colleagues (2022) estimated the highest age group

at risk for IPV is among young women between the ages of 15 and 19. A study published by Garcia-Moreno and colleagues (2015) identified that 38.6% of female murders globally are attributed to intimate partners.

The prevalence of IPV in Sub-Saharan Africa is among the highest in the world (Christopher et al., 2022; Tesfa et al., 2020). In a 2010 study of 81 countries, the lifetime prevalence of IPV among women in Sub-Saharan Africa was estimated at 65% (Devries et al., 2013). However, a more recent study has estimated a lifetime prevalence of IPV among women at 45% in Sub-Saharan Africa (Tesfa et al., 2020).

In 2018, the rate of IPV in Rwanda was estimated to be between 35% and 39% (Sardinha et al., 2022). A recent study comparing the 2015 and 2020 national demographic surveys in Rwanda reported that the prevalence of IPV had increased from 40.1% in 2015 to 46% in 2020. According to the 2020 data, the rates of IPV among women were higher in the rural areas, in the Southern and Eastern provinces, and among those aged 30 years and above (Bahati et al., 2022). A study published in 2021 estimated that 40.2% of women in Rwanda have ever experienced IPV after analyzing demographic and health survey data from 2011 to 2015 (McClintock & Dulak, 2021).

Despite the fact that published evidence does note some risk factors to explain why IPV rates are significantly higher in Sub-Saharan Africa in comparison to other regions of the world, a closer look at common risk factors of intimate partner violence might help guide our research in search for further evidence to prevent IPV. The most

common found risk factors associated with IPV include low socioeconomic status, young age, lower education levels, social acceptance of partner violence in society, and negative societal attitudes towards women (Lutgendorf, 2019). Studies conducted in Sub-Saharan Africa specifically identified socioeconomic status, women's financial dependence on their partners, male dominance, history of IPV in the family, and alcohol consumption as key risk factors (Bahati et al., 2022; Tesfa et al., 2020; Wado et al., 2021). Despite the fact that laws and legislation as well as government support to reduce gender-based violence do exist in Rwanda, all the above-mentioned factors could be a contributor to the higher than average intimate partner violence rate.

IPV is a human rights violation (WHO, 2015). The survivors of IPV experiences many negative effects including physical, emotional, mental, and sexual health challenges. These effects include depression, anxiety, post-traumatic stress disorder, and hopelessness (Association of Women's Health, Obstetric and Neonatal Nurses, 2019; Lutgendorf, 2019). In terms of sexual health effects, studies have shown that women who experience IPV are at a higher risk for acquiring sexually transmitted infections and HIV, in particular (Jewkes & Morrell, 2010; Sugg, 2015). One reasoning is that women are infected through forced sexual interactions by their male partners with HIV; another explanation is linked to the loss of autonomy and sexual decision making and the need to negotiate condom use with a male partner which can be difficult in the setting of IPV. We can identify more factors like hopelessness, depression, alcohol and substance use,

and PTSD as factors that might also impede impact safe sex practices or induce feeling that one's life no longer matters (Chepuka et al., 2021). Women who are facing IPV and then are found to be living with HIV frequently are less likely to disclose their HIV status to a partner due to the fear of violence and economic abandonment from their partner as well as fear of stigma and blame from their family as well as their communities (Breiding et al., n.d.; Chepuka et al., 2014; Devries et al., 2013; Dude, 2011; García-Moreno et al., 2015; Pettifor et al., 2004).

Since Sub-Saharan Africa bears a high burden of both IPV and HIV with over two thirds (66%) of all new HIV cases in the world occurring in this region. In this region, women comprise 59% of new HIV cases (McClintock & Dulak, 2021). In Rwanda, it is estimated that 230,000 people are living with HIV of which 60% are women aged 15 and older (UNAIDS, 2021).

Studies in Sub-Saharan Africa have looked at the relationship between intimate partner violence and HIV and estimated that low sexual decision-making power attributes to a 50% increase in the likelihood of HIV infection.(Jewkes & Morrell, 2010) These studies also identified that among women reporting IPV, the odds of having HIV were higher specifically in Rwanda. It is estimated that 12% of new HIV infections in Sub-Saharan Africa are the result of IPV.

Therefore, the purpose of this study is to explore the relationship between intimate partner violence and HIV in Rwanda. This study was designed to answer the

following research questions:

- 1) What is the prevalence of IPV among women with HIV (WWH) in our sample?
- 2) Do women who experience IPV have lower, self-esteem , hope and coping self-efficacy among WWH ?
- 3) Do women with HIV experiencing IPV have higher depression rates than those who never experienced IPV ?
- 4) Do women with HIV experiencing IPV have higher HIV stigma rates than those who never experienced IPV ?

2. Methods

2.1. Design

This secondary analysis is from data collected in a cross-sectional, descriptive observational study designed to psychometrically evaluate a set of linguistically and culturally adapted instruments related to HIV among Rwandan women with HIV.

2.2 Setting

Based on HIV epidemiologic data demonstrating higher HIV prevalence in urban areas compared to rural areas in Rwanda, data was purposively collected in both urban and rural settings. Specifically, participants for this study were recruited from two health centers in the urban setting of Kigali city and at three health centers in the Rulindo district, a rural area in the Northern Province. Data collection occurred between 8 June and 28 August 2021 in Rwanda.

2.2 Participants

162 Rwandan women with HIV were purposefully recruited. As previously described, purposive sampling considered two factors: geography (urban versus rural) and age (21 to 24 and above 25). At the time of the initial study, most recent data showed a disproportion in HIV new infection prevalence among women in urban areas aged 15 to 24 hence why the sample was purposefully recruited based on this age and geography.

Participants were included in the study if they met the following criteria: a cisgender woman with HIV (WWH) ages ≥ 21 (age of adulthood defined by the Rwandan government at the time of the study), able and willing to voluntarily consent to participate in the study, able to travel to a data collection site in their local community (health center, HIV clinic, university-based infectious disease/HIV clinic, or HIV and AIDS service organization). At the time of obtaining informed consent, eligible participants could not demonstrate any acute psychological/physiological distress; if they did, they were excluded from this study and assisted with referral for care by a study team member. Self-identified transgender WWH were not considered eligible to participate in this study as a transgender identity is highly stigmatized and would be a confounding factor to HIV-related stigma.

For the purposes of this secondary analysis, we included the data collected from participants in Rwanda which with the total sample including 162 WWH. As the parent study was a psychometric evaluation of adapted instruments, based on MacCallum et al.'s (1999) simulation study, a sample size of 162 was estimated to produce an excellent recovery rate of convergent and admissible factor solutions under most data conditions (ratios of items vs. factors and size of communality).

2.3 Procedures

The quantitative data used for this analysis was collected in Rwanda between 8 June and 28 August 2021. Nurses at the urban and rural health centers described above

developed a list of WWH who met the age requirements and other inclusion criteria and expressed interest in participating in the study after an initial conversation about the study facilitated by the nurses. The Rwandan project director, a master's prepared registered nurse, contacted WWH on the list provided by the nurses at the health center. During the conversation with the project director, the full details related to the study were discussed. WWH who remained interested were invited to participate in the study. Once they agreed to participate, they were scheduled for a date and time to meet with a member of the study team to complete the study related questionnaires.

Upon arrival to the site for data collection, written informed consent in the local language (Kinyarwanda) was obtained; for those women not able to read and write, a thumbprint was obtained. As part of the informed consent procedures, study participants were informed that they could decline to answer any question or end the interview at any time with no implications to them or their receipt of care and treatment at the local health center. Data collection took place in a private, secure location out of sight/hearing of non-participants to ensure confidentiality. Since data was collected during the Covid-19 pandemic, all national guidelines from the Rwanda Ministry of Health were followed. This included washing of hands upon entry to the health center; physical distancing as possible during the interview; and wearing a mask during the interview.

Data was collected via electronic Samsung tablets using Open Data Kit (ODK) – a secure web-based application managed by the Duke University Office of Clinical Research (DOCR). ODK was used, instead of RedCap, as it does not require Wi-Fi to collect data. Using the Samsung tablets, with pre-loaded Kinyarwanda and English surveys, research assistants interviewed study participants and entered data directly into the tablet. Hard copies of the study instruments were also available in case of any technology failure; for this study, all data was collected using the hand-held tablets. Participants in the study were assigned study identification numbers to protect confidentiality. Only the Rwandan project director had access to the secured electronic file that linked the study identification number to the name of the study participant.

At the end of each data collection day, the study personnel returned to the university to secure all tablets in a locked file cabinet. Within 24 hours of data collection, the data collected on the tablets were uploaded to the study's database using the ODK technology; data was secured on a cloud platform. Once successful data download and transfer was confirmed, data on the tablet was deleted. Once data collection was completed, all the data was transferred to Duke University secure cloud-based Box folder for cleaning by the study's lead statistician. For this secondary data analysis, a de-identified database of only variables related to the specific aims of the study was provided.

All study procedures were approved by the ethical review boards at Duke University Health System IRB (approval # Pro00101942), and the University of Rwanda, College of Medicine, and Health Sciences IRB (No522/CMHS IRB /2019).

2.4 Measures

2.4.1 Intimate partner violence

Intimate partner violence was measured using the 20 item Conflict Tactics Scale (CTS2) short form questionnaire (Straus & Douglas, 2004). The scale measures three types of violence: physical, emotional, and sexual. A response of 8 is never happened, 7 is it happened but not within the last year and 1 through 6 is it happened within the last year with 1 having the lowest frequency of once and 6 more than twenty times last year. Question examples include “ I had a sprain, bruise, or small cut, or felt pain the next day because of a fight with my partner.”

2.4.2 HIV stigma

Internalized, perceived, anticipated, and experienced stigma was measured using an adapted version of Sayles’ multidimensional measure HIV stigma scale (Sayles et al., 2008) which was developed and tested on people with HIV in the United States which was adapted to Rwanda context. This was scored on a scale of 0 to 5 with 5 being the highest. Examples include “ Having HIV make me feel dirty” “People avoid me because I have HIV.”

2.4.3 Depression

Depression levels were measured using the 10 item PHQ-9 scale (Kroenke et al., 2001). The nine questions ask about symptoms associated with depression and help clinicians and researchers screen for severity of depression. The PHQ-9 asks participants to rate how often they “have been bothered” with a list of problems over the last two weeks and address experiences with tiredness, sleepiness, depression, concentration etc. The PHQ-9 total scores equate to different levels of depression severity as follows:

Table 2. PHQ-9 categories definition

PHQ-9 Total Score	Depression Severity
0-4	None-minimal
5-9	Mild
10-14	Moderate
15-19	Moderately severe
20-27	Severe

Among this sample of Rwandan WWH (N = 162), the Cronbach alpha of the Kinyarwanda version of the PHQ-9 was 0.901.

2.4.4 Hope

The State of Hope Scale (Snyder et al., 1991) was used to determine the hope levels of participants. It is a six-item scale with questions pertaining to success and goals. Examples of questions asked are as follows, “At the present time”, “I am energetically pursuing my goals”. The scoring was from 1 to 4 one being definitely true and 4 being definitely false. Scores can range from 6 to 48, with higher scores representing higher

hope levels. Among this sample of Rwandan WWH (N = 162), the Cronbach alpha of the Kinyarwanda version of the State of Hope Scale was 0.907

2.4.5 Self- Esteem

Self-esteem was measured using the 10 item Rosenberg Self-Esteem Scale (Rosenberg, 1989). Participants were asked questions like "I feel that I am a person of worth, at least on an equal plane with others." and their answers were scored on a 4-point Likert scale ranging from strongly disagree to strongly agree. Higher scores indicate higher self-esteem. Among this sample of Rwandan WWH (N = 162), the Cronbach alpha of the Kinyarwandan version of the Rosenberg Self-Esteem Scale was 0.71

2.4.6 Coping Self- Efficacy

The Chesney Coping Self-Efficacy Scale was used to measure the level of coping (Chesney et al., 2006). The 13-item scale was used and scored with 0 , 1 or 2 where 0 means cannot do it at all , 1 is moderately certain can do and 2 is certain can do. Example questions include" Take small steps to resolve a problem that is upsetting to me." "Make new friends." Scores ranged from 0 to 26. Higher score indicated higher coping levels. Among this sample of Rwandan WWH (N = 162), the Cronbach alpha of the Kinyarwandan version of the Coping Self-Efficacy Scale was 0.934

2.5 Analysis

The original data was cleaned by the lead statistician on the study. For this study and analysis, the items related to the specific research questions associated with this study were transferred to box in a SAV file. The file was imported into R (R core team, 2022). The original sample was 162 Rwandan women with HIV. However, 38 participants did not complete the CTS2 as they were not in an intimate relationship in the past year. Hence, these 38 entries were excluded from the analysis yielding a final sample of 124. Intimate partner violence (sexual, physical, psychological) was recoded to a dichotomous variable (experienced, not experienced) and analyzed as such. Some variables were transformed into categories for the purposes of statistical comparison like age, education level and income. A cross tabulation analysis was done between intimate partner violence and demographic data where intimate partner violence was stratified by exposure and demographic data was shown categorically.

Logistic regression models were used to calculate the association between exposure to intimate partner violence and the following covariates: geography, age, income, education, stigma, depression, hope and coping self-efficacy. For continuous variables (hope, stigma, coping self-efficacy, self-esteem) an additional t-test was conducted with $p\text{-value} < 0.05$ representing significance as well as a mean comparison.

3. Results

3.1 Prevalence of IPV among women with HIV in our sample

Out of the final sample of 124 women with HIV in Rwanda who confirmed to be in a dating relationship in the past year, 91 answered “no” to ever being exposed to intimate violence while 33 answered “yes”. The prevalence of any form of intimate partner violence in this sample was 33 out of 124 which is a rate of 26.6%

We analyzed 8 items from the CTS score which pertained to victimization only. Items 5,10,12 and 15 were related to physical violence , items 4 and 14 were related to psychological violence and items 18 and 20 were related to sexual violence. We then calculated the percentage of violence by type in the overall population which showed that the most prevalence form of IPV was psychological at 24% followed by physical at 17% of total population and then sexual at 14 %.

Table 3. Table showing frequency of violence by type.

	Any IPV		Physical		Psychological		Sexual	
	Yes	No	Yes	No	Yes	No	Yes	No
Rwandan Women with HIV (N = 124)	27% (n=33)	73% (n=91)	17% (n=21)	83% (n=103)	24% (n=30)	76% (n=94)	14% (n=17)	86% (n=107)

3.2 Does IPV vary by age, geography , education level or income ?

1) Age

Age was recoded into four categories – 18 to 29 , 30 to 39 , 40 to 49 and above 50. A cross tabulation showing the frequency by type was done (Table 3) followed by a linear

regression model to calculate the odds ratio among the two categories. The odds of experiencing intimate partner violence with respect to age was not found to be statistically significant . (Table 4)

Table 4. Frequency of IPV stratified by age and violence type (N = 124)

Age Group	Any IPV		Physical		Psychological		Sexual	
	Yes	No	Yes	No	Yes	No	Yes	No
18 -29	15% (n=18)	39% (n=48)	10% (n=12)	44% (n=54)	14% (n=17)	39% (n=48)	9% (n=11)	44% (n=55)
30 -39	6% (n=7)	6% (n=8)	5% (n=6)	7% (n=9)	6% (n=7)	6% (n=8)	2% (n=3)	10% (n=12)
40 -49	5% (n=6)	16% (n=20)	2% (n=2)	19% (n=24)	3% (n=4)	18% (n=22)	2% (n=2)	19% (n=24)
50+	2% (n=2)	12% (n=15)	1% (n=1)	13% (n=16)	2% (n=2)	12% (n=15)	1% (n=1)	13% (n=16)

Table 5. Odds ratio of IPV by Age group

Age	OR	CI 95%	p-value
18 to 29 (Referent Group)	1	1.18 – 1.46	
30 to 39	1.21	0.94 – 1.55	0.126
40 to 49	0.95	0.78 – 1.17	0.681
50 +	0.85	0.67 – 1.08	0.197

2) Geography

The original survey stratified the data as Urban , Semi- Urban and Rural. A cross tabulation showing the frequency of violence by type was done (Table 5) followed by a

linear regression model to calculate the odds ratio among the three categories. The odds of experiencing intimate partner violence among those living in urban areas was 1.28 times larger (OR = 1.28, 95% CI = 1.08 – 1.51) than the odds for those living in rural areas. While for those living in Semi-Urban no statistical significance was found as the OR included 1 (OR= 0.93, 95% CI = 0.76 - 1.14) . Since the literature does not suggest an association between location and intimate partner violence, we cannot conclude if this clinically significant without further studies.

Table 6. Frequency and OR of IPV by geography

Geography	OR	CI 95%	p-value
Rural (Referent Group)	1	1.08 - 1.35	
Semi-Urban	0.93	0.76 - 1.14	0.5
Urban	1.28	1.08 – 1.51	0.004

Geography	Any IPV		Physical		Psychological		Sexual	
	Yes	No	Yes	No	Yes	No	Yes	No
Geography (N= 124)								
Urban	15% (n=19)	19% (n=24)	8% (n=10)	27% (n=33)	13% (n=16)	22% (n=27)	8% (n=10)	27% (n=33)
Semi Urban	2% (n=3)	17% (n=21)	2% (n=2)	18% (n=22)	2% (n=3)	17% (n=21)	0% (n=0)	19% (n=24)
Rural	9% (n=11)	37% (n=46)	7% (n=9)	39% (n=48)	9% (n=11)	37% (n=46)	6% (n=7)	40% (n=50)

3) Education Level

This variable was transformed to the following categories : no schooling , some schooling, secondary school , higher secondary school, and Certificate/ Diploma which was the highest education level achieved by a participant in our sample . A cross tabulation showing the frequency of violence by type was done (Table 6) followed by a linear regression model to calculate the odds ratio among the three categories. The odds of experiencing intimate partner violence in relation to education was not found significant in this sample as all odds ratios included 1 (Table7).

Table 7. Frequency of IPV by Education.

Education Level	Any IPV		Physical		Psychological		Sexual	
	Yes	No	Yes	No	Yes	No	Yes	No
No Schooling	6% (n=8)	10% (n=12)	6% (n=7)	10% (n=13)	6% (n=8)	10% (n=12)	2% (n=3)	14% (n=17)
Some schooling	14% (n=17)	43% (n=53)	9% (n=11)	48% (n=59)	12% (n=15)	44% (n=55)	8% (n=10)	48% (n=60)
Secondary School	6% (n=7)	16% (n=20)	2% (n=2)	20% (n=25)	5% (n=6)	17% (n=21)	3% (n=4)	19% (n=23)
Higher secondary school	1% (n=1)	3% (n=4)	1% (n=1)	3% (n=4)	1% (n=1)	3% (n=4)	0% (n=0)	4% (n=5)
Certificate/Diploma	0% (n=0)	2% (n=2)	0% (n=0)	2% (n=2)	0% (n=0)	2% (n=2)	0% (n=0)	2% (n=2)

Table 8. Odds Ratio of IPV by Education

Education	OR	CI 95%	p-value
Higher Secondary(Ref)	1	0.82 -1.80	

No School	1.22	0.79 – 1.89	0.5
Secondary School	1.06	0.69-1.62	0.3
Some Schooling	1.04	0.70-1.56	0.7
Highschool	0.82	0.39 – 1.70	0.8

4) Income

This variable was transformed to the following categories: (1) very low income, (2) low income, or (3) average income or higher. These categories were determined based on the average monthly household income in Rwanda which is 221\$ according to the world bank data . A cross tabulation showing the frequency of violence by type was done (Table 9) followed by a linear regression model to calculate the odds ratio among the three categories. The odds of experiencing intimate partner violence for those having low income was 1.30 times higher than those with very low income (OR=1.30 95% CI 1.10-1.54)

Table 9. Odds Ratio of IPV by Income.

Income	OR	CI 95%	p-value
Very low income (Referent)	1	1.10-1.32	
Low income	1.30	1.10-1.54	0.002
Average or higher income	0.82	0.35-1.92	0.6

Table 10. Frequency of IPV by Income.

Income	Any IPV		Physical		Psychological		Sexual	
	Yes	No	Yes	No	Yes	No	Yes	No
Very low income	14% (n=17)	57% (n=71)	10% (n=12)	61% (n=76)	12% (n=15)	59% (n=73)	9% (n=11)	62% (n=77)
Low Income	10% (n=12)	12% (n=15)	6% (n=7)	16% (n=20)	10% (n=12)	12% (n=15)	3% (n=4)	19% (n=23)
Average income or higher	3% (n=4)	4% (n=5)	2% (n=2)	6% (n=7)	2% (n=3)	5% (n=6)	2% (n=2)	6% (n=7)

3.3 Does IPV impact self-esteem, hope and coping self-efficacy among WWH in Rwanda?

A Shapiro test was conducted to investigate if the data was normally distributed and yielded a significant p-value <0.05; hence, t-tests and generalized linear models will be used to test the relationship between IPV and self-esteem, hope, coping self-efficacy as continuous outcomes.

1) Self-Esteem

Upon fitting self-esteem as a predictor into a generalized linear model with any form of violence ever occurring being the outcome, the p-value was <0.05 showing a statistically significant relationship between self-esteem and intimate partner violence. A t-test ($t = -3.06$, $df = 57.61$, $p\text{-value} < 0.01$) further confirmed that the mean of self-esteem among those who WWH who experienced violence is not the same as among those who did not experience it. The below box plot (Fig 3) shows that those who experienced violence had a lower mean of self-esteem (mean= 28.7) as opposed to those who did not

experience it (mean= 30). We can conclude that those in our sample those who experience intimate partner violence had a lower self-esteem than their counterparts who did not experience IPV.

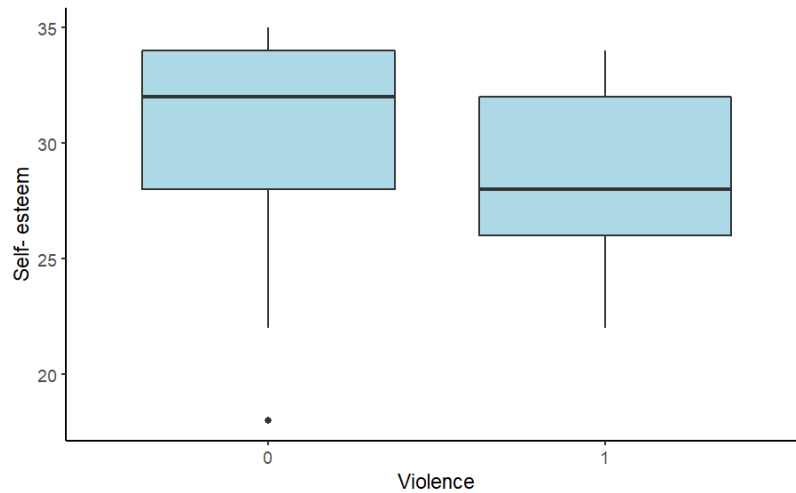


Figure 1. Box Plot of mean of self-esteem comparing those who experienced IPV to those who did not

2) Hope

Upon fitting hope as a predictor into a generalized linear model with any form of violence ever occurring being the outcome, the p-value was <0.05 showing a statistically significant relationship between self-esteem and intimate partner violence. The below box plot (Fig 4) shows that those who experienced violence had a lower mean of self-esteem (mean= 18.5) as opposed to those who did not experience it (mean= 19.6). We can conclude that those in our sample who experience intimate partner violence have lower hope than their counterparts who did not experience IPV.

However, a t-test($t = -1.7891$, $df = 59.192$, $p\text{-value} = 0.07871$) did not have a significant p-value.

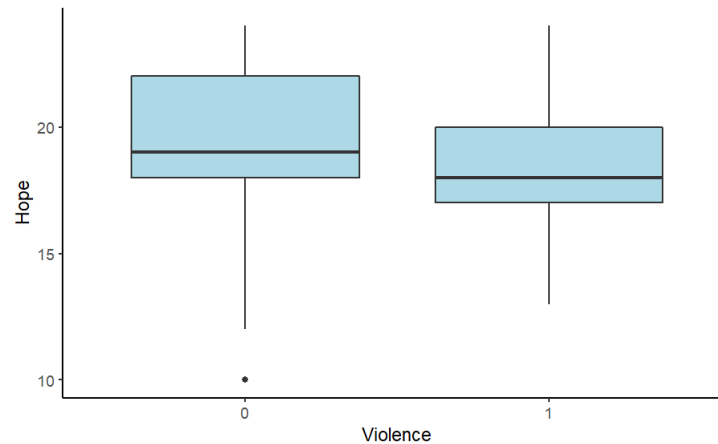


Figure 2. Box Plot of mean of Hope comparing those who experienced IPV to those who did not.

3) Coping self-efficacy

Upon fitting coping self- efficacy as a predictor into a generalized linear model with any form of violence ever occurring being the outcome the p-value was <0.05 showing a statistically significant relationship between coping self-efficacy and intimate partner violence. A t-test ($t = -3.5$, $df = 62.8$, $p\text{-value} < 0.01$) further confirmed that the mean of coping self-efficacy among those who experienced violence is not the same as among those who did not experience it. The below box plot (Fig 5) shows that those who experienced violence had a lower mean of coping self-efficacy (mean= 15.1) as opposed to those who did not experience it (mean= 18.2). We can conclude that those in our sample who experience intimate partner violence has lower coping levels than their counterparts who did not experience IPV.

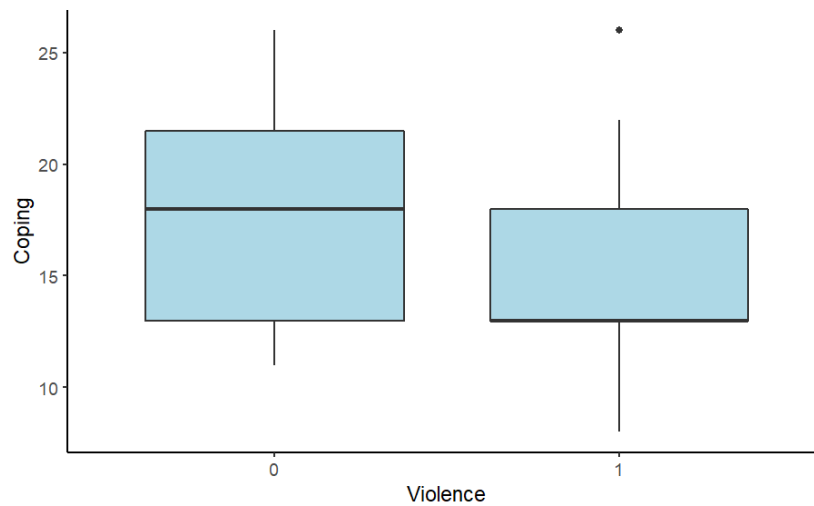


Figure 3. Box Plot of mean of Coping comparing those who experienced IPV to those who did not.

3.4 Do women with HIV experiencing IPV have higher depression rates than those who never experienced IPV?

Table 11. Frequency of IPV stratified by depression severity.

Depression	Any IPV (N = 124)		Physical		Psychological		Sexual	
	Yes	No	Yes	No	Yes	No	Yes	No
Minimal to no	10% (n=12)	12% (n=15)	6% (n=7)	16% (n=20)	10% (n=12)	12% (n=15)	3% (n=4)	19% (n=23)
Mild	3% (n=4)	4% (n=5)	2% (n=2)	6% (n=7)	2% (n=3)	5% (n=6)	2% (n=2)	6% (n=7)
Moderate	8% (n=10)	19% (n=24)	4% (n=5)	23% (n=29)	6% (n=7)	22% (n=27)	6% (n=8)	21% (n=26)
Moderately Severe	12% (n=15)	43% (n=53)	6% (n=8)	48% (n=60)	12% (n=15)	43% (n=53)	2% (n=3)	52% (n=65)
Severe	4% (n=5)	6% (n=7)	4% (n=5)	6% (n=7)	4% (n=5)	6% (n=7)	3% (n=4)	6% (n=8)

Depression rates were coded according to PHQ-9 guidelines previously described under section 2.4.3 table 2 . A cross tabulation showing the frequency of violence by type was done (Table 10) followed by a linear regression model to calculate the odds ratio among the three categories. The odds of experiencing depression with respect to intimate partner violence was not found to be statistically significant as all of ours Odds Ratios included 1 (Table11)

Table 12 Odds Ratio of IPV by depression severity.

Depression	OR	CI 95%	p-value
Mild)(Referent)	1	0.19-8.46	
Minimal	0.67	0.26-1.76	0.4
Moderate	1.71	0.42-6.74	0.4
Moderately Severe	1.44	0.25-7.00	0.6
Severe	0.000004	N/A	0.9

3.5 Do women with HIV experiencing IPV have higher HIV stigma than those who never experienced IPV? ?

A Shapiro test conducted to investigate if the data is normally distributed and yielded a significant p-value<0.05; hence, t-tests and generalized linear models will be used to test the relationship between IPV and stigma. Stigma in the Sayles multidimensional measure HIV stigma scale used is divided into four subtypes, perceived , experienced, anticipated and internalized.

1)Perceived Stigma

Upon fitting perceived stigma as a predictor into a generalized linear model with any form of violence ever occurring being the outcome, the p-value was <0.05 showing a statistically significant relationship between perceived stigma and intimate partner violence. A t-test ($t = 1.97, df = 56, p\text{-value} < 0.05$). This confirmed that the mean of perceived stigma among those who experienced any type of IPV is not the same as among those who did not experience it. The below box plot (Fig 6) shows that those who experienced violence had a higher perceived stigma mean (mean = 29.5) than those who did not experience it (mean = 26.4). We can conclude that those in our sample those who experience intimate partner violence had higher perceived stigma levels than their counterparts who did not experience it.

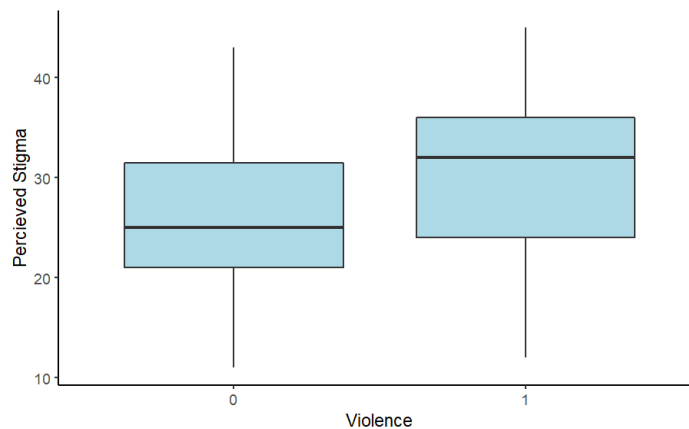


Figure 4. Box Plot of mean of perceived stigma comparing those who experienced IPV to those who did not

2) Experienced Stigma

Upon fitting experienced stigma as a predictor into a generalized linear model with any form of violence ever occurring being the outcome, the p-value was <0.05 showing a statistically significant relationship between experienced stigma and intimate partner violence. A t-test ($t = 2.5$, $df = 52.7$, $p\text{-value} < 0.01$) further confirmed that the mean of experienced stigma among those who experienced violence is not the same as among those who did not experience it. The below box plot (Fig 7) shows that those who experienced violence had a higher experienced stigma mean (mean = 6.1) than those who did not experience it (mean = 4.1). We can conclude that those in our sample who experience intimate partner violence had higher experienced stigma levels than their counterparts who did not experience it.

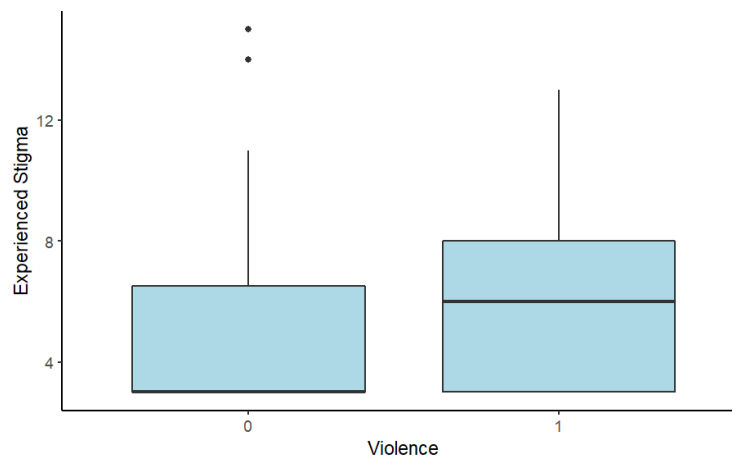


Figure 5. Box Plot of mean of experienced stigma comparing those who experienced IPV to those who did not.

3) Anticipated Stigma

Upon fitting anticipated stigma as a predictor into a generalized linear model with any form of violence ever occurring being the outcome, the p-value was <0.05 showing a statistically significant relationship between anticipated stigma and intimate partner violence. A t-test ($t = 2.09$, $df = 65.5$, $p\text{-value} <0.05$) with a p-value of 0.03 further confirmed that the mean of anticipated stigma among those who experienced violence is not the same as among those who did not experience it. The below box plot (Fig 8) shows that those who experienced violence had a higher anticipated stigma mean (mean = 15.2) than those who did not experience it (mean = 12.2). We can conclude that those in our sample who experience intimate partner violence had higher anticipated stigma levels than their counterparts who did not experience it.

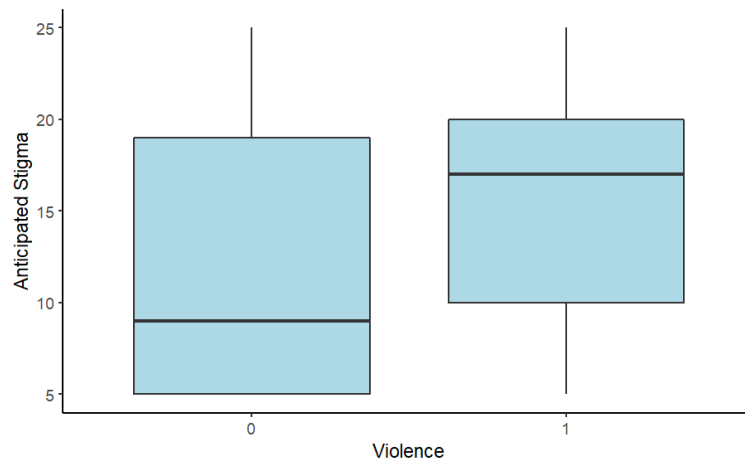


Figure 6 Box Plot of mean of anticipated stigma comparing those who experienced IPV to those who did not

4) Internalized Stigma

Upon fitting internalized stigma as a predictor into a generalized linear model with any form of violence ever occurring being the outcome, the p-value was <0.01 showing a statistically significant relationship between internalized stigma and intimate partner violence. A t-test ($t = 2.9$, $df = 64.9$, $p\text{-value} < 0.05$) further confirmed that the mean of internalized stigma among those who experienced violence is not the same as among those who did not experience it. The below box plot (Fig 9) shows that those who experienced violence had a higher internalized stigma mean (mean = 55.9) than those who did not experience it (mean = 66). We can conclude that those in our sample those who experience intimate partner violence had higher internalized stigma levels than their counterparts who did not experience it.

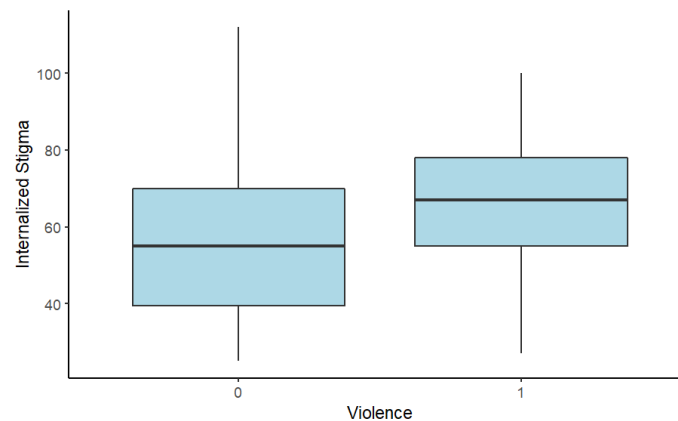


Figure 7. Box Plot of mean of internalized stigma comparing those who experienced IPV to those who did not.

4. Discussion

This study is among few that examined intimate partner violence and psychological outcomes among women with HIV in Sub-Saharan Africa and the first to examine this topic in Rwanda. Our finding shows that the prevalence of intimate partner violence in our sample of 124 women with HIV was 26.61% which is lower than the estimated 40% by the Rwandan demographic data survey and published studies (McClintock & Dulak, 2021; Sardinha et al., 2022). Further studies comparing populations with HIV to those without HIV are required to determine whether prevalence is lower among those with HIV and the correlation between HIV and the prevalence of IPV. As for demographic characteristics of age, education, and income, we hypothesized to find a difference in intimate partner violence since published studies in Sub-Saharan Africa (Bahati et al., 2022; Linos et al., 2013; Tesfa et al., 2020) found that IPV was more prevalent among those who are younger, have less education, and lower income. Additionally according to Linos et al.(2013), women who have higher education in Nigeria were found to report IPV less. Similar studies by (Dillon et al., 2016) and Stöckl and colleagues (2021) also showed that income, education, and economic empowerment were highly correlated with IPV . This study of Rwandan WWH found no statistical significance between these demographic factors and the prevalence of intimate partner violence which is not congruous with the literature in Sub-Saharan Africa. It must also be noted that over the time spent in Rwanda, many

women openly discussed intimate partner violence with our team and financial dependency was a commonly mentioned theme. Hence, we will recommend that future studies purposefully sample of women from all socioeconomic and educational backgrounds in Rwanda to test for any correlation. As for geographic location, we found significance in the prevalence of IPV between urban and rural areas where women in urban areas were more likely to report IPV. This is not congruous with the literature that reports that women anywhere can be exposed to IPV (Bahati et al., 2022; Dillon et al., 2016) We cannot confirm whether this is due to urban women experiencing more IPV or because they are more likely to report it.

Upon testing the difference between psychological outcomes (coping self-efficacy, hope, self-esteem, and depression) in those experiencing intimate partner violence and those who never did, we hypothesized that women exposed to IPV will have worse psychological outcomes measured by lower Coping self-efficacy , lower self-esteem, and less hope. Moreover, according to our analysis women exposed to intimate partner violence had higher HIV related stigma (experienced , anticipated , internalized, and perceived) , less coping self-efficacy, lower self-esteem and lower hope levels and since HIV is highly stigmatized in this region , we encourage future studies looking into interventions reducing IPV to also research tailored interventions to those with HIV as they have double burden of stigma and disease. No interventions designed to reduce IPV for those with or without HIV are currently present in Rwanda. Hence, we hope this

study is one of many to look into this issue in order for researchers and stakeholders to look at ways to reduce intimate partner violence among Rwandan women.

4.1 Study strengths and limitations

This study's main strength is that the instruments used have all been translated and validated to the Rwandan setting. Moreover, the sampling was purposeful according to HIV prevalence in the country allowing for a diverse representation of ages and location. Limitations of the study include the small sample size and the sampling strategy which will have implications on the generalizability of the results. Further, the cross-sectional design of the original study does not allow for inference of causation. Hence, we would not be able to conclude whether our measured outcomes impact or were impacted by intimate partner violence but only infer a relationship.

4.2 Implications for further research

Given the impact that intimate partner violence can have on mental health, physical health (Lutgendorf, 2019) and HIV related outcomes, future studies should explore the relationship between IPV and HIV care engagement. They should also explore a possible relationship between prevalence and demographics. Moreover, researchers should look into community based qualitative research in order to better understand intimate partner violence from the viewpoint of survivors, health care workers, government officials, legal entities as well as the community at large. This is to ensure that everyone involved in providing care as well as the support systems of

women are aware of this issue and their input is considered. Longitudinal studies need to be conducted to explore causal relationships and obtain data about incidence of IPV. This will lead the way into the development of an intervention to decrease the prevalence of intimate partner violence in Rwanda among all women not only those living with HIV.

4.3 Implication for clinical practice :

This study documents that among this sample of women with HIV , one in four reports to having experienced intimate partner violence. Additionally, women who experienced IPV had higher HIV stigma, lower hope, self-esteem, and lower coping self-efficacy. Thus, it is important to add screening of IPV to standard of HIV care in Rwanda. In the United States, many international organizations including the WHO and CDC do not recommend a specific tool to measure IPV. Therefore, clinical and policy research needs to be done in Rwanda to determine the number and types of questions that could be used in the clinical environment to improve screening rates of IPV. Staff training on such tools and their importance ,initial and ongoing, needs to be done. Referral mechanisms from HIV treatment and care centers need to be put in place for women who are discovered to be abused. Unintended consequences might include that women lose their financial source or get even more stigma from their families especially if their partners are legally prosecuted so it's important to include social support in their care.

5. Conclusion

This study is one of the first to look at the relationship between intimate partner violence and psychological outcomes among women with HIV in Rwanda. We were able to conclude that there is a relationship between intimate partner violence and psychological outcomes as women who experienced intimate partner violence had less hope, self-esteem and coping and they had higher stigma levels. Despite the literature supporting a relationship between income, age, and depression our study found no statistical significance. More studies tailored to looking at the relationship between intimate partner violence and these associated factors are required in order to better understand the relationship and the possibility of a causation factor. Due to the fact that intimate partner violence has not been heavily researched in Rwanda and limited studies exist we suggest that future research not only focus on women with HIV but all women. Intimate partner violence is a preventable public health issue and further research will provide more information to stakeholders allowing interventions and corrective measures to eliminate it

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