ORIGINAL RESEARCH

The relationship between intimate partner violence and HIV outcomes among pregnant women living with HIV in Malawi

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Abstract

Background

Intimate partner violence (IPV) is a global public health concern particularly in pregnancy where IPV can have negative health implications for the mother and child. Data suggest IPV disproportionately affects pregnant women living with HIV (PWLWH) compared to those without HIV. HIV-related outcomes are worse among women experiencing IPV. Despite this knowledge, there is paucity of data concerning PWLWH and IPV in Malawi, where there is a high HIV prevalence (10.6%).

Objectives

We aim to characterize IPV amongst PWLWH in Malawi and describe its relationship to demographic characteristics, psychosocial factors, and HIV-related outcomes.

Methods

This analysis used data from the VITAL Start pilot study, which is a video-based intervention targeting retention and ART adherence amongst PWLWH in Malawi. PWLWH not on ART were recruited at antenatal clinic and given study questionnaires to assess demographics, IPV, and psychosocial factors. Questionnaires were also administered at one-month follow-up to assess outcomes related to HIV. Descriptive statistics and logistic regression models were used to explore the risk factors associated with IPV.

Results

Thirty-nine percent of participants reported ever experiencing IPV from their current partner. The majority (53%) reporting IPV experienced more than one type of violence. IPV was associated with being married ($p=0.04$) and depression ($p<0.0001$) in the univariable analysis. For women retained at one-month, IPV was associated with reporting a missed ART dose in the past month but not with adherence measured by pill count.

Conclusions

A large proportion of PWLWH experienced IPV from their current partner and IPV was associated with worse self-reported ART adherence at one-month follow-up. Further evidence is needed to understand how IPV impacts PWLWH throughout postpartum and beyond. Given the detrimental impact on health outcomes among PWLWH in Malawi, additional focus on IPV is essential to identify mechanisms to prevent, screen, and manage IPV among this population.

Key words: IPV, abuse, HIV, Malawi, adherence, violence

Introduction

Globally, intimate partner violence (IPV) is a public health concern, including in the sub-Saharan African region where current prevalence estimates 44% of women have experienced IPV.[1] IPV includes any behavior within an intimate relationship that causes physical, psychological, or sexual harm to those in the relationship.[2] Intimate partner violence can negatively affect the physical and emotional well-being of the victim and can have downstream health consequences. In the context of pregnancy, IPV can detrimentally impact both maternal and neonatal health outcomes.[3-10]

Data suggest IPV rates among pregnant women may be higher amongst pregnant women living with HIV (PWLWH) compared to non-infected pregnant women.[11,12] In sub-Saharan Africa estimates of IPV among PWLWH range from 20% - 60%.[13-16] In one South African study, PWLWH without a history of IPV had a higher risk of IPV after pregnancy, compared to non-infected pregnant women.[17]

IPV has been linked to worse antiretroviral treatment (ART) adherence and viral load suppression in women living with HIV (WLWH).[18-20] PWLWH already face substantial challenges with ART adherence and retention in care[21] and IPV during pregnancy can compound these challenges.[20] Furthermore, IPV during pregnancy can also negatively impact mental health outcomes and has been associated with a higher risk of depression.[22-24] Experiencing IPV during pregnancy may increase the odds of postpartum depression,[25] and depression has been linked to worse HIV outcomes such as ART non-adherence, virologic failure, and AIDS-related mortality.[26-28]

In Malawi, the lifetime prevalence of IPV is estimated to be 38% among ever-partnered women aged 15-49.[29] However,

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rates of IPV during pregnancy and among PWLWH have not been well documented. Estimates of IPV during pregnancy among Malawian women vary widely, from 5% from the Malawi Demographic Health Survey in 2015,[30] to 21% in a reproductive health study in Lilongwe District,[8] and up to 59% from a recent study conducted in Nsanje District.[31] Despite evidence from other countries in the African region that risk of IPV is higher amongst PWLWH, and that IPV detrimentally impacts HIV treatment and health outcomes, no published data on IPV exists among PWLWH in Malawi.

This analysis aims to address this gap by 1) characterizing IPV amongst PWLWH in Lilongwe, Salima, and Mangochi Districts in Malawi and 2) describing its relationship to demographic and psychosocial factors, as well as its relationship to partner disclosure, ART adherence, and retention in ART clinic.

Methods

Setting

This analysis used data from a study that examined the acceptability, feasibility, and early implementation outcomes of a video-based intervention on retention and ART adherence amongst pregnant women living with HIV in Malawi (VITAL Start, Video-intervention to inspire treatment adherence for life).[32] The study took place in three government health facilities in central and southern Malawi which offer free HIV and ART services. The study sites are an urban health facility in Lilongwe and semi-urban health facilities in Mangochi and Salima districts. In Malawi, over 95% of pregnant women between 2010-2015 attended at least one antenatal care (ANC) visit and >90% give birth at a health facility.[30] HIV testing coverage at ANC is >90% for the first clinic visit as per Malawi Ministry of Health (MOH) HIV testing guidance.[30] Prevalence of HIV in Malawi is 10.6% among the adult population, and higher among women (12.8%).[33]

All pregnant women identified in ANC as HIV positive and not on ART were offered pre-ART counselling (randomized to either VITAL Start or standard of care). Both VITAL Start and standard of care included counselling on the importance of adhering to ART and encouraged partner disclosure. First-line ART regimen for all women newly initiating treatment at the time of this study was a fixed-dose combination pill containing tenofovir, lamivudine, and efavirenz.

Study Population Eligibility and Recruitment

Detailed information regarding VITAL Start has been published.[32] In brief, PWLWH not receiving ART who presented for antenatal care between December 2016 to Feb 2018 were eligible for recruitment. Other eligibility criterion included age ≥18 years, or if she was married or had a previous child then she could be ≥16 years; understands Chichewa; no disabilities that would prevent her from viewing or understanding the intervention video; residence in the health center catchment area for 12 months. Women identified as eligible were informed about the study by trained research assistants (RA). Baseline questionnaires were administered at enrollment and a follow-up questionnaire was given at one-month post enrollment assessing self-reported adherence and behavioral factors that affect women's ability to start and remain on an ART regimen. Intimate partner violence (IPV) was assessed at enrollment. One-month follow up surveys were conducted at the clinic. If the participant did not return for the survey, she was traced using locator information (up to three phone call attempts and home visit attempts).

Data collection

Trained RAs administered baseline and one-month questionnaires that were translated into Chichewa and back-translated to English. Items were pretested with potential participants to validate the language in the culture and context. Questionnaires were administered face-to-face and study follow-up visits were scheduled separately from clinic visits to avoid biasing the main outcome. Surveys were collected on paper and responses were entered in an Excel spreadsheet embedded with validations to ensure data quality. HIV related clinical data were extracted from patient medical records. Data were reviewed for accuracy and completeness.

Measures

Sociodemographics

Sociodemographic survey items included age, literacy, education, income, employment, marital status, pregnancy intention, condom use, number of sexual partners in the last year, cohabitation with partner, partner's age, and time since HIV diagnosis. For marital status we asked the participant if she was married or had a partner (which was classified as "steady partner"). Women without a partner were not asked IPV questions and therefore not included in the analysis. Partner's HIV status was reported by the participant.

Intimate Partner Violence and Other Psychosocial Outcomes (Depression, social support, alcohol and drug use)

We assessed psychosocial and behavioral characteristics using locally validated scales. IPV was measured using the World Health Organization (WHO) intimate partner violence survey.[34,35] IPV was only assessed on women who reported having a partner (either married or steady partner) and collected only at baseline (at enrollment). IPV had binary responses (Yes/No) for a total of 13 items and assessed ever having experienced sexual (e.g., "Has he physically forced you to have sexual intercourse when you did not want to?"), emotional (e.g., "Has he insulted you or made you feel bad about yourself?"), or physical violence (e.g. "Has he slapped you or thrown something at you that could hurt you?") from the participant's current partner. Any 'Yes' response was classified as experiencing IPV from the current partner. Additional psychosocial measurements included depression WHO self-reporting questionnaire (SRQ),[36,37] social support (multi-dimensional scale of perceived social support (MSPSS),[38,39] alcohol use (alcohol use disorders identification test (AUDIT)),[40-42] and drug use (drug use disorders identification test (DUDIT).[43-45]

WHO SRQ included a 20-item survey with binary responses (Yes/No). Depression was categorized into low, medium, and high using cutoffs of 4 and 8.[37] MSPSS included 12 items scored on a 5-point scale, with a possible total score ranging from 5-60. MSPSS was sub-categorized into three groups including other, family, and friends, with possible score ranging from 5-20. A higher score indicates a higher level of the participants' perceived social support.[23] When calculating the summary scale, 'Refuse to answer' responses were considered missing. We used means calculated from the available items from the same scale and same individual. For SRQ, we imputed from individuals that completed at least 80% of items for SRQ. The imputed results were reported.

The AUDIT had 10 items with a maximum score of 40.

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Table 1. Descriptive Statistics of study population, N=262

Variable	No IPV n (% or SD)	Any IPV n (% or SD)	Total n (% or SD)	p-value
Total included in study population	161 (61.5)	101 (38.5)	262	
Age, years, mean (SD)	27.0 (5.4)	27.6 (5.8)	27.2 (5.5)	0.38
Education, n (%)				
None	17 (70.8)	7 (29.2)	24 (9.2)	
Some primary (standard 1-5)	40 (58.0)	29 (42.0)	69 (26.3)	
Primary (Standard 6-8)	44 (57.1)	33 (42.9)	77 (29.4)	0.48
Junior High School	32 (59.3)	22 (40.7)	54 (20.6)	
High School/ Secondary school	24 (75.0)	8 (25.0)	32 (12.2)	
Post-secondary	4 (66.7)	2 (33.3)	6 (2.3)	
Literate, n (%)				
No	41 (60.3)	27 (39.7)	68 (26)	0.95
Yes	118 (61.8)	73 (38.2)	191 (72.9)	
Missing	2 (66.7)	1 (33.3)	3 (1.1)	
Monthly Income, n (%)				
Less than 49,999 MK	109 (64.1)	61 (35.9)	170 (64.9)	
Between 50,000 and 99,999 MK	26 (52.0)	24 (48.0)	50 (19.1)	
Between 100,000 and 249,999 MK	16 (64.0)	9 (36.0)	25 (9.5)	0.63
250,000 MK or more	5 (62.5)	3 (37.5)	8 (3.1)	
Missing	1 (100.0)	0 (0.0)	1 (0.4)	
Refuse to answer	4 (50.0)	4 (50.0)	8 (3.1)	
Intended to become pregnant, n (%)				
No	30 (58.8)	21 (41.2)	51 (19.5)	0.41
Yes	131 (62.4)	79 (37.6)	210 (80.2)	
Refuse to answer	0 (0.0)	1 (100.0)	1 (0.4)	
Condom use before pregnancy, n (%)				
No	137 (61.4)	86 (38.6)	223 (85.1)	
Yes, sometimes	21 (70.0)	9 (30.0)	30 (11.5)	0.23
Yes, most times	2 (40.0)	3 (60.0)	5 (1.9)	
Yes, all the time	1 (25.0)	3 (75.0)	4 (1.5)	
Time of HIV diagnosis, n (%)				
Today	153 (61.4)	96 (38.6)	249 (95)	1.0
Before today, but during this pregnancy	5 (62.5)	3 (37.5)	8 (3.1)	
Before today, not during this pregnancy	3 (60.0)	2 (40.0)	5 (1.9)	
Number of sexual partners in last year, n (%)				
1	136 (60.7)	88 (39.3)	224 (85.5)	0.25
2 or more	20 (60.6)	13 (39.4)	33 (12.6)	
Missing	5 (100.0)	0 (0.0)	5 (1.9)	
Marital Status, n (%)				
Married	143 (59.6)	97 (40.4)	240 (91.6)	0.04
Steady partner	18 (81.8)	4 (18.2)	22 (8.4)	
Currently living with partner, n (%)				0.7
No	21 (65.6)	11 (34.4)	32 (12.2)	
Yes	140 (60.9)	90 (39.1)	230 (87.8)	

Table 1. Descriptive Statistics of study population (Cont)

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Table 1 Cont...

Partner's approximate age, n (%)	No IPV n (% or SD)	Any IPV n (% or SD)	Total n (% or SD)	
24 years or younger	15 (65.2)	8 (34.8)	23 (8.8)	0.96
25-34 years	82 (60.3)	54 (39.7)	136 (51.9)	
35 years or older	63 (62.4)	38 (37.6)	101 (38.5)	
Refuse to answer	1 (50.0)	1 (50.0)	2 (0.8)	
Partner's current HIV status, n (%)				
Negative	36 (56.3)	28 (43.8)	64 (24.4)	
Positive	14 (63.6)	8 (36.4)	22 (8.4)	0.78
Never test/Inconclusive/Don't know	110 (62.9)	65 (37.1)	175 (66.8)	
Refuse to answer	1 (100.0)	0 (0.0)	1 (0.4)	
SRQ§ total score (mean imputation), n (%)				
Low (0-4)	123 (72.8)	46 (27.2)	169 (64.5)	
Medium (>4-<8)	20 (50.0)	20 (50.0)	40 (15.3)	<0.0001
High (8+)	18 (34.6)	34 (65.4)	52 (19.8)	
Missing	0 (0.0)	1 (100.0)	1 (0.4)	
AUDIT¥ total score, n (%)				
Non-drinker (0)	145 (62.0)	89 (38.0)	234 (89.3)	
Low risk (1-7)	4 (57.1)	3 (42.9)	7 (2.7)	0.90
High risk (≥8)	2 (50.0)	2 (50.0)	4 (1.5)	
Missing	10 (58.8)	7 (41.2)	17 (6.5)	
DUDIT± total score, n (%)				
No drug-related problem (0)	147 (61.5)	92 (38.5)	239 (91.2)	1
Drug-related problem (≥2)	1 (50.0)	1 (50.0)	2 (0.8)	
Missing	13 (61.9)	8 (38.1)	21 (8)	
MSPSSβ significant others total score (complete items), mean (SD)	15.7 (1.8)	15.6 (2.0)	15.7 (1.9)	0.51
MSPSS family total score (complete items), mean (SD)	14.9 (2.5)	15.0 (2.8)	14.9 (2.6)	0.87
MSPSS friends total score (complete items), mean (SD)	14.3 (2.8)	13.7 (3.0)	14.1 (2.9)	0.15
MSPSS total score (complete items), mean (SD)	44.9 (5.8)	44.3 (6.1)	44.7 (5.9)	0.42

§Self-Reporting Questionnaire, WHO

¥ Alcohol use disorders identification test

± Drug use disorders identification test

β Multi-dimensional scale of perceived social support

Scores of zero were classified as non-drinkers, while 1-7 was classified as low-risk alcohol use and ≥8 was classified as harmful alcohol use.[46] The DUDIT had 11 items and a score of ≥2 indicated a possible drug related problem.[43] For both AUDIT and DUDIT, those with missing responses on the first question (which indicates whether she drinks or uses drugs at all) or reported as an alcohol/drug user but with missing responses on all following items were treated as missing data.

HIV Outcomes Measures

Surveys included HIV-related information such as adherence self-efficacy (ASE) (which assessed how well she expects to remain adherent to ART medication),[47,48] partner disclosure information (if her partner knew her status, when disclosure occurred, and who disclosed her status),[49] and self-reported adherence.[50,51] Date of ART start, pill count data, and one-month retention data were abstracted from patient medical records.

Adherence self-efficacy (ASE) was scored on a 4-point scale (1-4) with a total possible score of 44 signifying the highest level of perceived efficacy. Mean scores from the one-month follow up visit as well as the change score (month 1 minus baseline score) were calculated. For missing data, we reported imputed values from individuals that completed at least 80% of items for ASE.

Participants who had a recorded ART clinic visit 14-61 days after ART initiation were considered retained at one-month. Behavioral adherence was measured by self-report and pill count. For pill count the ratio of total number of pills given during the enrollment visit divided by the follow up time calculated the proportion of days covered (PDC).[52]

Table 2. Univariable logistic regression (outcome: any IPV experienced by current partner)

Variable	Mean (SD, n)/ n(%)	IPV Yes n(%)	OR (95% CI)	p-value	p-value (overall)
MSPSS friends total score (complete items)	14.1 (2.9, 260)		0.94 [0.86-1.02]	0.16	0.16
MSPSS total score (complete items)	44.7 (5.9, 259)		0.98 [0.94-1.03]	0.42	0.42
Education					0.12
None	24 (9.2)	7 (29.2)	1.15 [0.37-3.60]	0.81	
Some primary/ Primary/ Middle School (JCE)	200 (76.3)	84 (42.0)	2.03 [0.93-4.40]	0.07	
High school (MCSE) /Post-secondary	38 (14.5)	10 (26.3)	Reference	.	
Literate					0.88
No	68 (26.3)	27 (39.7)	1.06 [0.60-1.88]	0.83	
Yes	191 (73.7)	73 (38.2)	Reference	.	
Monthly income					0.25
Less than 49,999 MK	170 (67.2)	61 (35.9)	0.73 [0.43-1.25]	0.25	
≥50,000 MK	83 (32.8)	36 (43.4)	Reference	.	
Pregnancy intention					0.64
No	51 (19.5)	21 (41.2)	1.16 [0.62-2.17]	0.64	
Yes	210 (80.5)	79 (37.6)	Reference	.	
Time of HIV diagnosis					0.99
Today	249 (95.5)	96 (38.6)	1.0 [0.32-3.16]	0.99	
Before today	13 (5.5)	5 (38.5)	Reference	.	
Marital status					0.0495
Married	240 (91.6)	97 (40.4)	3.05 [1.00-9.30]	0.0495	
Steady partner	22 (8.4)	4 (18.2)	Reference	.	
Currently living with partner					0.61
No	32 (12.2)	11 (34.4)	0.81 [0.37-1.77]	0.61	
Yes	230 (87.8)	90 (39.1)	Reference	.	
SRQ total score (mean imputation)					<.0001
Low (0-4)	169 (64.8)	46 (27.2)	0.20 [0.10-0.38]	<.0001	
Medium (>4-<8)	40 (15.3)	20 (50.0)	0.53 [0.23-1.23]	0.14	
High (8+)	52 (19.9)	34 (65.4)	Reference	.	
AUDIT total score					0.62
Non-drinker	234 (95.5)	89 (38.0)	0.74 [0.22-2.48]	0.62	
Low/high risk	11 (4.5)	5 (45.5)	Reference	.	

The follow-up time was calculated as the duration between ART start date and the one-month visit during the 14-61 day retention period. If the PDC exceeded 1, the value was capped at 1. Adherence was categorized using a cutoff of 0.9. Participants with at least 90% pills covered in the interval were considered adherent, and those with <90% pills covered were considered not adherent.[53] Among those retained at one month, participants with missing pill count data prior to the visit were considered as a separate category (pills not given). To measure self-reported adherence, participants were asked at the monthly follow-up visit if they had missed any doses in the past 7 and 30 days.

Data Analysis

Descriptive statistics, such as mean and standard deviation (SD) for continuous variables, and frequency and proportion for categorical variables, were calculated among all subjects and by IPV status. Chi-Squared test/Fisher's exact test was used to compare the distribution of the categorical variables (proportions) between two groups. Both tests yielded consistent results and p-values from Fisher's exact tests were reported. For the continuous variables, two sample t-test was used to compare the means between two groups.

Logistic regression models were used to explore the risk factors associated with any IPV. Variables of interest or

Table 3. HIV Outcomes at month one by IPV experienced by current partner

Variable	No IPV	Yes IPV	Total	p-value
Started ART, n (%)				
No	1 (0.6)	0 (0.0)	1 (0.4)	0.92
Yes	134 (83.2)	86 (85.1)	220 (84.0)	
Missing	26 (16.1)	15 (14.9)	41 (15.6)	
Disclosed to Partner, n (%)				
No	16 (9.9)	12 (11.9)	28 (10.7)	
Yes	92 (57.1)	62 (61.4)	154 (58.8)	0.48
Already disclosed	29 (18)	12 (11.9)	41 (15.6)	
Missing	24 (14.9)	14 (13.9)	38 (14.5)	
Refuse to answer	0 (0.0)	1 (1.0)	1 (0.4)	
Retained in ART clinic, n (%)				
No	39 (24.2)	21 (20.8)	60 (22.9)	0.55
Yes	122 (75.8)	80 (79.2)	202 (77.1)	
Adherence (Pill count), n (%)				
<90%	21 (13.0)	15 (14.9)	36 (13.7)	
≥90%	100 (62.1)	63 (62.4)	163 (62.2)	0.71
Missing	39 (24.2)	21 (20.8)	60 (22.9)	
Pill not given	1 (0.6)	2 (2.0)	3 (1.1)	
Missed dose in past week, n (%)				
No	112 (69.6)	60 (59.4)	172 (65.6)	0.08
Yes	21 (13.0)	24 (23.8)	45 (17.2)	
Missing	28 (17.4)	17 (16.8)	45 (17.2)	
Missed dose in past month, n (%)				
No	107 (66.5)	56 (55.4)	163 (62.2)	
Yes	23 (14.3)	26 (25.7)	49 (18.7)	0.0499
Missing	31 (19.3)	18 (17.8)	49 (18.7)	
Refuse to answer	0 (0.0)	1 (1.0)	1 (0.4)	
ASE, total score (mean imputation), mean (SD)	35.2 (5.2)	35.6 (5.2)	35.4 (5.2)	0.58
ASE, Change in total score (mean imputation), mean (SD)	0.8 (5.5)	1.7 (6.2)	1.1 (5.8)	0.28

with clinical importance were considered in the modeling. We first performed univariable logistic regression models for all variables and those with p-values <0.2 were included in the model selection in multivariable logistic model. Some response categories were combined due to sparse cells or similar outcomes. The scale of the continuous variables was examined using smoothing spline techniques and quartile method to ensure that the assumption of linearity on the logit was appropriate. A backwards selection procedure was performed to select variables and those achieving statistical significance were retained in the model. The overall model fit was examined using Hosmer-Lemeshow test. The odds ratio (OR) estimates and their 95% confidence intervals (CI) were reported for the assessment on the strength of the associations.

All tests were two-sided. A p-value of 0.05 was deemed statistically significant. All analyses were performed using SAS software 9.4 (SAS Institute, Inc., North Carolina, USA).

Ethical Considerations

As per the larger study protocol, we obtained written, informed consent from all study participants. Participants who reported any IPV, suicidal ideation, high level of depression, drug/alcohol abuse, or any women exhibiting severe distress during the interview were referred to a trained, on-site psychosocial counsellor. The National Health Sciences Research Committee (NHSRC) of the Malawi Ministry of Health and the Baylor College of Medicine Institutional Review Board in the USA approved the study protocol.

Results

Cohort Characteristics

Of the 306 women enrolled in the VITAL Start pilot study, thirty-seven were excluded because they did not have partners so they were not asked IPV questions, and seven were excluded because they had missing data for IPV, therefore 262 women were eligible and and included in the analysis. Demographic and cohort characteristics can be found in Table 1. Mean (SD) age of study participants was 27 (5.5) years, 92% were married (n=240), 65% (n=169) completed primary school education (Standard 6-8), and 84% reported a household monthly income of <100,000 Malawi Kwacha (roughly 140 USD) (n=220). Most women learned their HIV diagnosis at the ANC visit during the time of recruitment (95%, n=249) and two-thirds (67%, n=175) reported not

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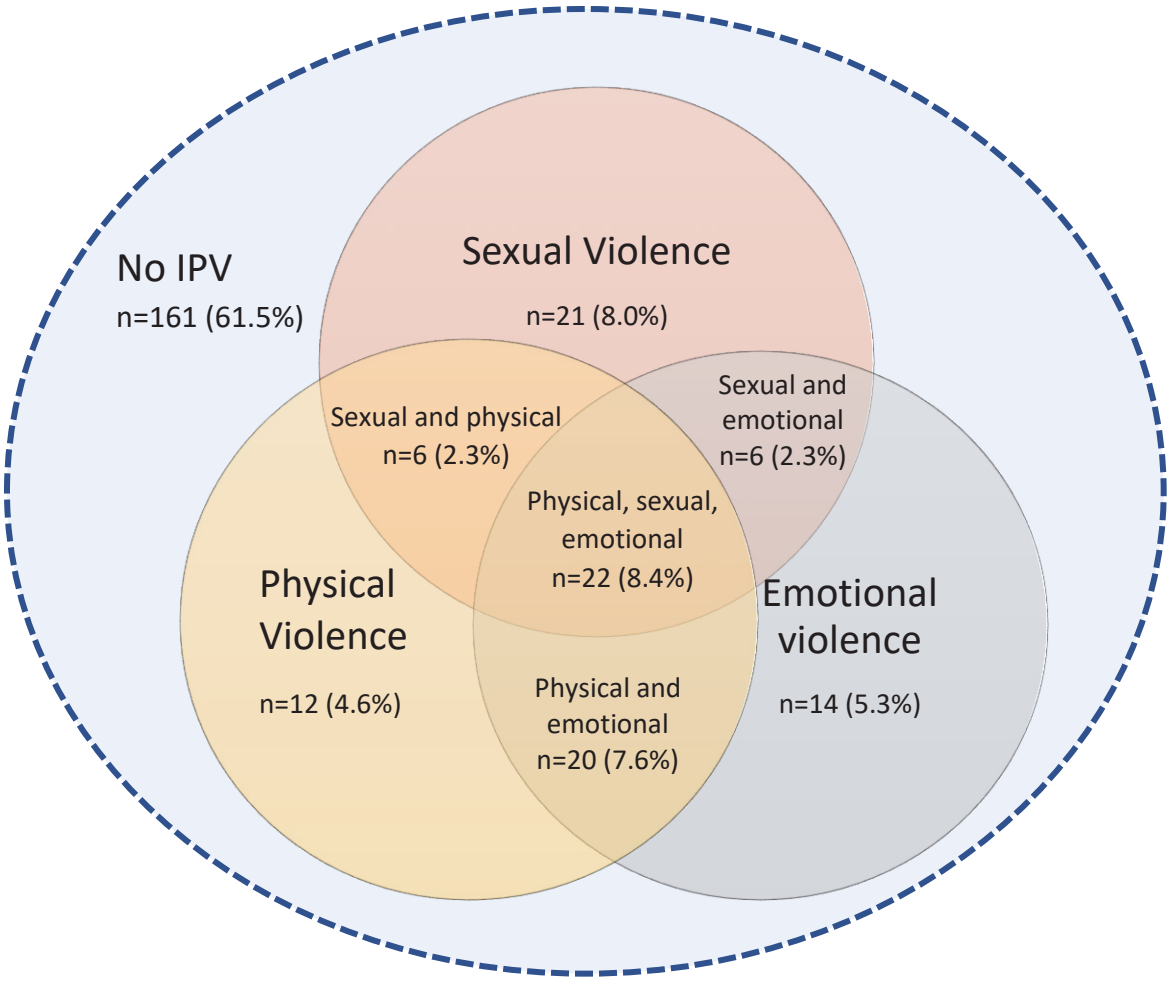

Figure 1. IPV experienced by current partner among study population (n=262)

knowing their partner's HIV status. Few women (11%, n=28) reporting ever drinking alcohol, and only four (1.5%) scored as a high-risk drinker. Similarly, only two women reported a drug-related problem (<1%).

IPV Prevalence and Factors associated with IPV

Thirty-nine percent of participants reported experiencing at least one form of IPV from their current partner (n= 101). Mean age of PWLWH experiencing IPV was 27.6 years. All three forms of IPV occurred at similar frequency (emotional: 24%, n=62; physical: 23%, n=60; sexual: 21%, n=55) (Figure 1). Among participants experiencing IPV, many experienced more than one type of IPV (53%, n=54). Twenty-two (8%) participants experienced all three measured forms of violence. In univariable analysis being married (p=0.04) and depression (p<0.0001) were the only characteristics associated with experiencing IPV. The univariable logistic regression model showed that with each unit increase in MSPSS friends total score, there was a 6% decrease in the odds of having any IPV, although this was not statistically significant (Table 2). Those who were married had three times increased odds of experiencing IPV compared to women with a steady partner [OR 3.05, 95% CI: 1.00-9.30, p= 0.0495]. Participants with few symptoms of depression (low SRQ score) had an 80% decrease in odds of having any IPV as compared those with high SRQ score [95% CI: 0.10-0.38, p<0.0001]. Multivariable logistic regression was attempted by including 4 variables (friend social support, education, marital status, depression) in the model selection, however, only SRQ score category was selected. Thus, no results from multivariable logistic regression are reported.

HIV Outcomes at One-month follow-up and the Relationship to IPV

At the one-month follow-up, 74% of women had disclosed to their partners (n=195) and 84% had started ART (n=220) (Table 3). Only one participant had not started ART (<1%), the remaining had missing data (16%). Of those with adherence data measured by pill count, 82% had adherence ≥90% (n=163). Self-reported non-adherence, measured by a missed dose in the past month, was higher amongst women reporting IPV compared to women not reporting IPV (26% v 14%, p=0.0499). Women who experience IPV were twice as likely to miss a dose in the past month (OR: 2.08 95% CI: [1.11-3.90]). There was no significant relationship between IPV and any other outcome including ART initiation, partner disclosure, adherence self-efficacy, or retention in care at one month.

Discussion

We found that among PWLWH in Malawi in our study population, prevalence of IPV was high (39%). Most women reporting IPV experienced more than one type of violence (53%). IPV was significantly associated with depression and being married. For women retained at the one-month follow-up visit, IPV was also associated with reporting a missed dose in the past month but not with adherence measured by pill count.

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Prevalence of IPV in our study (39%) was similar to the WHO African regional lifetime prevalence of violence against all women (36%),[54] prevalence in SSA (44%),[1] and to the lifetime estimates of IPV in Malawi (38%).[29] Measures of IPV, including tools and definitions used, make a difference in how IPV prevalence is interpreted. We used the WHO IPV tool and asked whether the woman had ever experienced IPV from her current partner, whereas other studies assessed IPV in the past year, lifetime prevalence from any partner, or specifically IPV during her current pregnancy. This could explain why our study found higher prevalence compared to similar studies conducted in SSA that ranged from 21%[13] to 32%[15] of PWLWH having experienced IPV in the past year. As with any self-reported measure, there is potential for social desirability bias which could have resulted in under-reporting of IPV. Additionally, the Malawian context may lead to underreporting due to participants considering IPV a personal issue that should remain private within a household.[55] Although our study staff were all experienced with counseling and attempted to build rapport with the study participants to create a comfortable environment, it is possible that women did not fully report IPV for fear of repercussions from her partner, or fear of judgement; hence the true prevalence of IPV may be higher.

In this analysis, around half (53%) of women reporting IPV experienced more than one type of violence, which was similar to findings in South Africa (48%).[13] In our study population emotional, sexual, and physical violence occurred at similar frequency; between 21-24% of women experiencing each IPV type. These findings are consistent with a study in Cameroonian HIV positive women which found 18-29% of HIV positive women (not just pregnant women) experienced each IPV type.[56] Twenty-one percent of our participants experienced sexual violence, which is similar to findings from a study in Malawi amongst pregnant women (both those living with or without HIV) (29%).[31] However, other studies in the region among PWLWH show varying results, with 2% in South Africa experiencing sexual violence in the past 12 months,[13] and 34% in Zambia experiencing sexual violence ever by their current partner (34%).[16] Regarding physical violence, 23% of the study population experienced this type of IPV ever in her current relationship. These findings are similar to other studies among PWLWH in South Africa (20%),[57] and the lifetime prevalence of physical violence in all Malawian women (20%).[58]

IPV was higher among married women compared to women with a steady partner. This is perhaps due to the fact that violence may be normalized in marital relationships in Malawi.[55] There was a significant association between SRQ (depression) and IPV, which is unsurprising given prior research. Several other studies have also reported this relationship among the pregnant population regardless of HIV status.[22,25,59] Since IPV was collected at one time point, we cannot comment on the direction of the association. Our analysis did not find an association between IPV and alcohol/drug abuse seen in other studies;[60,61] this may be because the rates of drinking (4%) or having a drug related problem (<1%) were very low.

Self-reported non-adherence, measured by a missed dose in the past month, was higher in women reporting IPV. This is consistent with findings among non-pregnant HIV positive women[18] and studies on PWLWH.[19,20] It should be noted however, that HIV outcomes were measured at the one-month follow up visit, therefore were only assessed on participants retained and may not reflect the overall study population. To reduce missing data, participants who missed the follow-up visit were traced using locator information given at enrollment, but some could not be reached.

We found no difference in partner disclosure amongst women experiencing IPV as compared to those not reporting IPV, whereas some studies have reported that women who experience IPV were less likely to disclose.[16,62] However, these studies also suggest a bidirectional association between status disclosure and IPV. Since we do not have follow up IPV assessments we do not know if there was an increase in IPV after disclosing, although this is an important area for future research. IPV was not associated with starting ART, although there was only one participant who did not start ART. There was also no association between IPV and adherence measured by pill count, or adherence self-efficacy even though there is an association in self-reported non-adherence (measured by missed doses). This may be because a pill count requires more missed doses (>3) to influence adherence (<90%). If a participant only missed one dose in the past month, her pill count would show good adherence (>90%) but she would be counted as non-adherent by self-reported missed doses. Additionally, the participants who started ART were still in the first month of their lifelong treatment at the time follow-up data were collected, and it is possible IPV may have a delayed effect on outcomes.

The high prevalence of IPV among PWLWH in this study (39%) demonstrates that additional attention on IPV is essential to identify mechanisms to prevent, screen, and manage IPV amongst PWLWH. Our study, which took place in antenatal clinic, adds to prior findings that screening and risk assessment in antenatal care may be an important starting point for identifying IPV among pregnant women.[63-65] Upon identification of IPV experience or risk, a variety of services have been shown to be effective among pregnant women, including active referral to psychosocial support and counselling to reduce anxiety and depression,[66] safety planning, linking to resources such as community-based support.[67] However, most of these solutions have been studied in high-income settings,[68] and data on effective scalable clinical based interventions for settings like Malawi are lacking. One recent intervention model in South Africa ("Safe and Sound") provides a package of care in antenatal clinic, and findings from the health care workers expressed the importance of integrating HIV services with the IPV intervention.[69] Integration of service delivery for IPV prevention and intervention in antenatal and ART care may facilitate access to services that support PWLWH in Malawi.

Conclusion

To our knowledge, this analysis was the first to measure the prevalence of IPV, identify sociodemographic characteristics associated with IPV, as well as assess potential associations with early outcomes amongst pregnant women living with HIV not yet on ART in Malawi. In this study we asked IPV only at the time of enrollment, and therefore cannot assume directionality of associations. Further studies are needed to examine how IPV changes over time in PWLWH in Malawi and factors associated with increased risk of IPV, such as HIV status disclosure. This study corroborates existing literature that IPV is a global issue that needs focus in sub-Saharan Africa and demonstrates this problem among PWLWH in Malawi. IPV screening as well as interventions

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targeted to this subgroup are important to support PWLWH and optimize HIV outcomes.

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Author contributions

ECW wrote the manuscript with support from MHK. MHK designed the VITAL Start study and obtained the grant, as well as ethical approval. SA, TT, AM, MJC, and EJA provided input on study design. TT and AM oversaw the study and provided management to the study team. XY provided data management and analysis. All authors contributed to the manuscript review and final approval prior to submission.

Disclosure statement

The authors report no conflicts of interest.

Ethics and Consent

The VITAL Start study has been approved by the Malawi National Health Science Research Committee (protocol#16/05/1593) and the Baylor College of Medicine Institutional Review Board. All participants provided written, informed consent.

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Paper context

Intimate partner violence can have detrimental health and psychosocial effects on pregnant women living with HIV (PWLWH). To our knowledge, this study was the first to quantify IPV among PWLWH in the Malawian setting. We identify sociodemographic characteristics associated with IPV and assess potential associations with early outcomes amongst PWLWH in Malawi. We conclude that IPV is a problem facing PWLWH in Malawi, and specific interventions may be needed to support this population.

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