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Intimate partner violence, social support, and depression among women living with HIV in Wakiso District, central Uganda: findings from a sequential mixed-methods study

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Abstract

Background Intimate partner violence (IPV) remains a pervasive public health concern, disproportionately affecting women worldwide and posing significant risks to their physical and psychological well-being. Women living with HIV (WLHIV) are particularly vulnerable to IPV though both its extent or nature and impact on mental wellbeing of WLHIV in Uganda have not been extensively examined. The aim of this sequential explanatory mixed-methods study was to examine the association between intimate partner violence, social support, and depression in WLHIV in central Uganda.

Methods We sampled 215 for the quantitative strand. The Abusive Behaviour Inventory (ABI), Beck Depression Inventory (BDI) and Multi-Dimensional Scale of Perceived Social Support measured IPV, depression and social support respectively. These were followed by individual face-to-face semi structured interviews with a subsample of 10 women. Descriptive frequencies, Pearson correlations and process macro were analyzed in SPSS software while interviews were analyzed thematically.

Results Overall, 15.1% experienced IPV, 24.9% were depressed respectively, and 68.4% had moderate to high perceived social support as well as significant negative correlations between IPV and depression. Social support significantly mediated the relationship between IPV and depression. Qualitative results explained the earlier quantitative results under three main themes: (1) Multiple forms of Violence/Abuse (2) Managing and Coping with Violence/abuse.3) Impact of Violence/abuse.

Conclusion Addressing IPV, promoting social support and financial independence can enhance efforts aimed at ART adherence and improving mental health outcomes among vulnerable WLHIV.

Keywords Intimate partner violence, Social support, Depression, HIV/AIDS, Women and sequential mixed methods

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Background

The prevalence of depression among people living with HIV/AIDS (PLHIV) is significantly higher than in the general population [1]. Women living with HIV/AIDS (WLHIV) are particularly vulnerable to depression, with estimates ranging from 49.2% [2] to 64.2% [1]. Recent studies show that 28.2% WLHIV experience depressive symptoms [3]. Depression among WLHIV has been attributed to several factors including HIV-related stigma and discrimination, socioeconomic challenges, social support deficits and mental health comorbidities [4].

Given these psychosocial vulnerabilities, intimate partner violence defined as physical, sexual, or psychological harm by a current or former partner is prevalent among WLHIV and further compromises their mental health [5]. Studies have shown that WLHIV experience higher rates of IPV compared to the general population. Global estimates indicate that approximately 27% of ever-partnered women experience physical and/or sexual IPV in their lifetime [6]. Among people living with HIV, meta-analytic data suggest a somewhat higher burden, with about 39% reporting lifetime IPV [7]. In Uganda specifically, 44.2% of women living with HIV in care have ever experienced physical and/or sexual IPV [8].These figures underscore why it is particularly important to focus on Uganda: the prevalence of IPV among women with HIV here is markedly high compared both to the general global population and to other WLHIV contexts, reinforcing the need for tailored interventions.

Important to note, the relationship between IPV and depression among WLHIV is bidirectional and multifaceted [9]. Women who experience IPV often endure emotional trauma, low self-esteem, and social isolation, all of which can precipitate depressive symptoms [10]. Conversely, depression can impair a woman's ability to make protective decisions against abusive situations [11]. Overall, depression can exacerbate the physical and mental health consequences of IPV, leading to a worsening cycle of abuse and mental health deterioration [12] with serious implications for health outcomes [13] including further weakening of the immune system thus making it more challenging for WLHIV to manage their condition effectively [14].

In Uganda, traditional gender roles and societal expectations may overlap with experiences of IPV. Perpetrators of IPV might exploit existing social norms and power dynamics to keep women dependent and socially isolated. Additionally, societal attitudes that prioritize privacy and family reputation over individual well-being can exacerbate the sense of isolation felt by abused women [15]. Social isolation is common among women who are abused in part because perpetrators use IPV to retain dominance and control.[1] However, social support helps alleviate social isolation, stress and enhance quality of life [16]. Women seem to be more protected from being victimized by their partners when they have friends or family to turn to for assistance than when they do not [17]. Social support reduces psychological distress such as depression and it can help mitigate the negative relationship [18]. Sharing experiences of IPV, with a supportive response, is associated with better mental health outcomes [19]. Seeking support from a network of people who are supportive and sympathetic improves women's coping skills and reduces the negative mental health outcomes of IPV [20]. However, survivors of sexual abuse may struggle to talk about their experiences and emotions [21] potentially increasing risks of depression through various mechanisms.

The stress-buffering model posits that social support functions as a protective factor that buffers the negative effects of stress on mental health [22]. When individuals perceive adequate social support, they are better equipped to cope with stressors, reducing the likelihood of adverse psychological outcomes such as depression. However, the availability and effectiveness of social support may vary depending on factors such as the quality of relationships, cultural norms, and the nature of the stressor [23]. Research suggests that not all forms of social support are equally effective. Emotional support, for instance, has been shown to be particularly beneficial in mitigating stress, while instrumental support [24] may be less impactful in certain contexts. Moreover, social support can influence the relationship between IPV and depression by providing an avenue for disclosure and help-seeking [25]. Women who are victims of IPV but have access to supportive relationships are more likely to disclose their experiences of violence thus reducing risks of severe depression. For the WLHIV, experience of IPV can compromise adherence to Antiretroviral Therapy, which is the use of a combination of HIV medicines to control the virus, reduce its amount in the body, and prevent its transmission, exacerbate depression and affect their general quality of life. There is however limited comprehensive research that has examined the association between IPV, social support, and depression in WLHIV in Uganda despite growing prevalence of IPV in the general population [26]. Uganda remains a priority setting because of its continued HIV burden, the documented presence of gender-based violence shaped by distinctive socio-cultural and economic forces, and the urgent need for evidence that can be integrated into existing HIV care platforms [27]. This study examined

[1] Social support is a broad concept that includes different types of help, such as emotional support, practical assistance, and information sharing, that a person receives from others.

the association between intimate partner violence, social support and depression among WLHIV.

Methods and materials

Study design

A sequential explanatory mixed-methods research design was used to holistically examine IPV, social support and depression among WLHIV. First, quantitative survey data were collected and analyzed followed by qualitative individual interviews and analysis, and finally interpretation of results where we established associations between quantitative and qualitative results.

Study setting and participants

The study was conducted at a level IV public health facility, in rural Wakiso District, central Uganda. In addition to the general health services such as outpatient and maternal and child care, the health facility offers antiretroviral therapy (ART) to over 3500 PLHIV.

Sample and sampling technique

A sample of 215 WLHIV determined by G* power considering a statistical power of at least 0.8 with an alpha of 0.05 and a medium effect size (d = 0.50) [28] took part in the quantitative study. A priori sample size estimation was conducted using G Power version 3.1. To detect a medium effect size (d = 0.50), with an alpha level of 0.05 and statistical power of 0.80, the required minimum sample size for correlation/mediation path analysis was calculated. Using the "t tests – Correlation: Point biserial model" and "Linear multiple regression – Fixed model, R^2 deviation from zero" modules, G Power estimated that a minimum of N = 128–176 participants would be necessary depending on the number of predictors. To ensure adequate power for mediation analysis and account for potential missing data, the final sample was increased to N = 215 WLHIV. We employed a purposive sampling strategy to select participants. The purposive sampling strategy allowed us to deliberately select participants meeting specific characteristics central to the aim of the study. The inclusion criteria for both strands were: women aged between 15 and 49 years since it is the reproductive age; HIV positive and receiving care at the study facility and currently living or previously lived with intimate partner. These participants were selected basing on specific characteristics above in the inclusion criteria.

For the qualitative strand, all participants who reported moderate to high IPV with a minimum cut of score of 1.5 on the Abusive Behavioral Inventory in the quantitative survey were eligible to participate. All the 28 women meeting this criterion were telephoned and requested to come back to the health facility for qualitative interview as earlier informed during the survey. Only 10 women responded and consented to the qualitative interview. The reasons for the 18 women declining the interview were: having recently visited the health facility for routine care (11) and not wanting to be audio-recorded (7).

We deductively analyzed individual interview transcripts to help expound quantitative results regarding nature of IPV, social support and level of depression. Basing on categories of spouse/partner violence/abuse in the Diagnostic Statistical Manual, 5th edition [29]we delineated the different forms of violence/abuse, their consequences and ways the women managed or coped with violence as reported by our participants.

Data collection

Instruments and materials

For the quantitative data collection instruments, we did not obtain licenses to use the scales. The qualitative interview guide, which has not been published elsewhere, was developed specifically for this study.

Quantitative strand

The Beck Depression Inventory (BDI; Beck, 1961) [30] was used to measure depression. This 21-item self-report scale measures the severity of depression, with each item rated on a 4-point Likert scale ranging from 0 to 3. Each item on the BDI presents a specific symptom of depression, and respondents select the statement that best describes their experience over the past two weeks. For example, the item assessing sadness includes the following options, 0: "I do not feel sad."1: "I feel sad." 2: "I am sad all the time and I can't snap out of it." 3: "I am so sad or unhappy that I can't stand it." In this context, a rating of 0 signifies the absence of sadness, while a rating of 3 indicates an extreme level of sadness. A total score ranging from 0 to 63 is calculated by summing the ratings with higher scores indicating more severe depressive symptoms. The original reliability of the BDI amongst non-psychiatric patients was 0.81 [31]. Regarding the reliability of the original BDI, studies have reported high internal consistency, with Cronbach's alpha coefficients typically around 0.9. Test-retest reliability coefficients range from 0.73 to 0.96, indicating stability over time [32]. In Uganda, the BDI-II has been utilized and validated in various studies. For instance, research conducted among people living with HIV in Kampala demonstrated good psychometric properties, with a Cronbach's alpha of 0.79 and an Expected A Posteriori (EAP) reliability coefficient of 0.86 [33].

The Abusive Behavior Inventory (ABI; Melanie F. Shepard and Patricia A. Campbell,1992) [34] was used to measure abuse. This 30-item self-report instrument assesses the frequency of abusive behaviors, encompassing both physical and psychological abuse. Each item is rated on a 5-point Likert scale ranging from 0 to 4, where 0 indicates"never"1indicates Rarely,2 indicates

Occasionally,3 indicates Frequently and 4 signifies "very frequently." The total score is obtained by summing the item responses, with higher scores reflecting more frequent abusive behaviors. The reliability of the original ABI was 0.92 [34], studies have demonstrated high internal consistency. Cronbach's alpha coefficients are reported as 0.92 for the entire scale, 0.91 for the psychological abuse subscale, and 0.86 for the physical abuse subscale [35].

The Multidimensional Scale of Perceived Social Support (MSPSS; Gregory D. Zimet, 1988) [36] measured perceived social support. This 12-item self-report instrument assesses perceived social support from three sources: family, friends, and significant others [36]. Each item is rated on a 7-point Likert scale ranging from 1 (very strongly disagree) to 7 (very strongly agree). Subscale scores for family, friends, and significant others are calculated by averaging the responses to the four items corresponding to each category. The reliability of the original MSPSS, studies have demonstrated high internal consistency, with Cronbach's alpha coefficients ranging from 0.81 to 0.98 across various samples. Test-retest reliability has also been established, indicating the scale's stability over time [36]. In Uganda, the MSPSS has been adapted and validated to ensure cultural relevance and reliability. A study conducted among postpartum mothers in Mulago Hospital employed a cross-sectional design with 240 participants. The adapted MSPSS demonstrated good internal consistency, with a Cronbach's alpha of 0.83 [37].

Qualitative strand

Audio recorded face to face individual interviews were conducted by the first author in either English or Luganda. A semi structured interview guide was used to collect the data from the women. Key questions included (1) Please tell me about your experience of abuse or violence by your husband/boyfriend/spouse in your previous or current relationship(s)? (2) How have you been affected by the abuse or violence you have experienced? (3) How have you managed or coped with abuse and/or violence you have faced over time? While this approach allows women to narrate their experiences in their own words, direct self-report measures of IPV are known to be susceptible to underreporting. As highlighted by Aggarwal, S., et al. [38] face-to-face disclosure of violence can be constrained by fear, stigma, emotional discomfort, or concerns about confidentiality, meaning that some participants may minimise or withhold certain experiences. Although the interviews in this study were conducted privately by the first author, using a semi-structured guide and a supportive, non-judgmental approach, the risk of underreporting cannot be fully eliminated. This limitation should be considered when interpreting the findings, as the qualitative data may represent a conservative estimate of participants' actual experiences of IPV.

Data analysis

The quantitative data collected for the study were analyzed using the Statistical Package for the Social sciences (SPSS) version 21. Frequencies were computed for sociodemographic information and descriptive statistics of key variables. Pearson correlations and Process Macro [39] tested relationship between variables and the mediating role of social support respectively. Based on existing literature and theoretical considerations, the study tested the following hypotheses:

1. There is a significant relationship between intimate partner violence and depression.
2. There is a significant relationship between intimate partner violence and social support.
3. There is a significant relationship between social support and depression.
4. Social support significantly mediates the relationship between intimate partner violence and depression.

This analytical approach allowed for the examination of both direct and indirect pathways linking IPV, social support, and depression, providing insight into potential mechanisms underlying the mental health outcomes of women living with HIV.

Interviews were transcribed verbatim and those conducted in Luganda translated into English before analysis. Data analysis involved the following steps. First, familiarizing ourselves with the data while keeping in mind the key areas informed by the quantitative results. Second, using a deductive approach, we generated initial codes by systematically identifying data segments that aligned with predetermined categories derived from the numerical patterns observed. These codes were concise and focused on specific aspects relevant to the study objectives. In the third step, we searched for themes by organizing these codes into broader, conceptually-driven themes that reflected the patterns established during the quantitative phase. We examined how the codes related to each other and to the predefined areas of interest. In the fourth step, we reviewed the themes to ensure they were consistent with the dataset and accurately reflected the participants' responses in the context of the prior quantitative findings. We then defined and named the themes, crafting precise descriptions that captured each theme's meaning and relevance, ensuring they remained distinct yet interconnected. Finally, we produced the report, presenting the themes alongside illustrative quotes that brought depth to the quantitative findings and offered a comprehensive narrative aligned with the

study's mixed-methods design. This structured and theory-informed process enhanced the integration of qualitative insights and strengthened the overall validity of the study.

Quality control

Ensuring rigorous quality control was a key priority in this mixed methods study to enhance the validity, reliability, and credibility of the findings. Several measures were implemented throughout the research process, beginning with the sampling procedures. To ensure that the sample met the required study inclusion criteria, we employed purposive sampling. Clear inclusion and exclusion criteria were established to minimize selection bias, ensuring that only relevant participants were included in the study. Additionally, a power analysis was conducted to determine an adequate sample size, which strengthened the study's generalizability and the accuracy of its inferences.

During data collection, strict quality control measures were followed to ensure consistency and reliability. The first author collected all the data to reduce interviewer bias and achieve consistency. The study employed validated instruments with established reliability to ensure that the data collected were both accurate and meaningful. All measures had previously been used in Uganda with similar samples showing satisfactory reliability.

Data management and analysis also followed rigorous procedures to maintain accuracy and consistency. A double data entry approach was used, where two independent data clerks entered quantitative data separately before reconciling any discrepancies. Data analysis software with built-in consistency checks helped to detect anomalies and flag inconsistencies, reducing the likelihood of errors. Triangulation was applied by integrating multiple data sources and analytical methods to cross-verify findings, further enhancing the credibility of the study.

Ethical considerations played a crucial role in maintaining the integrity of the research process. Informed consent was obtained from all participants, ensuring that they fully understood the purpose of the study.

The integration of qualitative and quantitative methods was carefully managed to ensure coherence in the study's findings. A sequential explanatory design was employed, where quantitative data were collected and analysed first, followed by qualitative data to provide deeper insights and contextualize the quantitative results. The integration of findings took place at the analysis stage, ensuring that both data sets contributed meaningfully to the overall conclusions. Finally, the study's results were reported in a structured and coherent manner, demonstrating how qualitative insights complemented and expanded upon the quantitative outcomes. By implementing these rigorous quality control measures at every stage, this study ensured the reliability of its findings and strengthened its contribution to the field. The systematic approach taken in sampling, data collection, analysis, and ethical considerations provided a solid foundation for producing valid results that are applicable to the broader population.

Table 1 Sociodemographic characteristics of participants[a]

Characteristic	Quantitative study *N* = 215 *n* (%) or M(SD)	Qualitative study *N* = 10 *n* (%)
Age	*26.76(8.32)*	
15–19	5 (2.3)	
20–24	30 (14.0)	1(10)
25–35	129 (60.0)	7(70)
36–49	51 (23.7)	2(20)
Education		
No education	18(8.4)	1(10)
Primary	78(36.3)	3(30)
Secondary	96(44.7)	4(40)
Tertiary	21(9.8)	2(20)
Employment		
Employed for cash	126(58.6)	3(30)
Not employed	86 (40.6)	7(70)
Marital status		
Never married	30 (14.0)	
Married/Cohabiting	155(72.1)	8(80)
Divorced/separated/widowed	30(14.0)	2(20)
Number of children	*2.47(0.75)*	
0	12(5.6)	
1–3	104(48.4)	7(70)
4+	97(45.1)	3(30)

[a]Sociodemographic characteristics of participants in the quantitative ($N = 215$) and qualitative ($N = 10$) strands. Quantitative data are presented as n (%) or mean (SD); qualitative data show the corresponding participant distribution

Results

Sociodemographic characteristics

The sociodemographic characteristics for both strands are presented in both Tables 1 and 2. The demographic data shows that the majority of respondents were aged 25–35 (60.0%) and in the population we had a few emancipated minors (2.3%). The highest level of education attained by most respondents is secondary education (44.7%), and majority are employed for cash (58.6%). Marital status data reveals that 72.1% are married or cohabiting, and nearly half of the respondents have 1–3 children (48.4%).

Sociodemographic characteristics of participants for the qualitative strand

This study employed both quantitative ($N = 215$) and qualitative ($N = 10$) approaches to examine the

Table 2 Demographics characteristics of qualitative interview participants[a]

Participant Number	Age	No of children	Marital status	Education
1	35	3	Married/Cohabiting	No education
2	34	4	Married/Cohabiting	Primary
3	32	3	Married/Cohabiting	Tertiary
4	38	4	Married/Cohabiting	Primary
5	30	4	Married/Cohabiting	Secondary
6	29	2	Married/Cohabiting	Tertiary
7	33	3	Separated	Secondary
8	36	1	Married/Cohabiting	Primary
9	23	2	Separated	Secondary
10	26	1	Married/Cohabiting	Secondary

[a]This table presents the age, number of children, marital status, and education level of the ten women who participated in the qualitative interviews. These demographics provide context for understanding their experiences of IPV, social support, and mental health

sociodemographic characteristics of women living with HIV. The mean age of participants in the quantitative sample was 26.76 years (SD = 8.32). Most participants fell within the 25–35 years age range (60%), followed by 20–24 years (14%), 36–49 years (23.7%), and 15–19 years (2.3%). Similarly, in the qualitative sample, the majority (70%) were aged 25–35 years, with only two participants above 35 years and one aged 23. This shows consistency in the age distribution across both datasets, with a focus on women in their reproductive years.

In the quantitative data, most participants had attained at least secondary education (44.7%), followed by primary education (36.3%), with a smaller proportion reporting tertiary (9.8%) and no education (8.4%). The qualitative participants reflected a similar spread: 40% had secondary education, 30% had primary, 20% had tertiary, and only one participant (10%) had no education. This alignment suggests that the qualitative sample reasonably mirrors the educational background of the broader population. A significant majority in both samples were married or cohabiting—72.1% in the quantitative sample and 80% in the qualitative sample. Only 14% in each sample were divorced/separated/widowed, and 14% (quantitative) or 0% (qualitative) were never married. This reflects a predominance of women in partnerships, providing relevant context for exploring intimate partner dynamics.

Table 3 presents descriptive characteristics of key variables and associated qualitative themes. The mean IPV score was 39.96 (SD = 13.30), indicating varied experiences of violence across participants. A majority of women (84.9%) reported low levels of abuse, while a smaller proportion experienced moderate (10.3%), high (4.3%), and very high (0.5%) levels of IPV. Despite most cases being classified as low-level abuse, the qualitative findings reveal that even seemingly moderate forms of IPV can have significant psychological and emotional effects, particularly when they are persistent or compounded by other stressors such as HIV.

Table 3 Descriptive characteristics of key variables and associated qualitative themes[a]

Quantitative Variable	Frequency (%)	Mean (SD)	Qualitative Themes	Sub Themes
IPV		39.96(13.30)	Multiple forms of Violence/ Abuse	Psychological and/or Physical Psychological and Neglect Sexual Violence
Low abuse	157(84.9)			
Moderate abuse	19(10.3)			
High abuse	8(4.3)			
Very high abuse	1(0.5)			
Social support		55.57(14.69)	Managing and Coping with Violence/abuse	Helpless and endure the abuse Self-encouragement and being hopeful Support from family, friends and health workers Financial independence for desired wellbeing
Low support	13(6.3)			
Moderate support	141 (68.4)			
High support	52(25.2)			
Depression		12.65(7.66)	Impact of Violence/abuse	Psychological Distress (anger, frustration, worry and anxiety) Feelings of worthlessness and suicidal thoughts Poor Adherence and Physical Health issues
Normal	78(37.9)			
Mild	77(37.4)			
Borderline	23(11.2)			
Moderate	24(11.7)			
Severe	2(1.0)			
Extreme	2(1.0)			

[a]Table 3 summarizes the quantitative distribution and mean scores of IPV, social support, and depression alongside related qualitative themes. It integrates severity levels with lived experiences of violence, coping, and psychological impact. Together, the table provides a comprehensive mixed-methods view of the key study variables

Table 4 Pearson correlation between Age, number of children living, intimate partner violence social support and depression[a]

Variable		1.Age	2 Number of children	3. TOT IPV	4.TOT SS	5. TOT D
1. Age	Pearson Correlation	1	.			
	Sig. (2-tailed)					
	N	215				
2. Number of living children	Pearson Correlation	0.528**	1			
	Sig. (2-tailed)	0.000				
	N	214	214			
3. TOT_IPV	Pearson Correlation	−0.019	0.045	1		
	Sig. (2-tailed)	0.796	0.532			
	N	192	191	192		
4. TOT_SS	Pearson Correlation	−0.023	−0.092	−0.269**	1	
	Sig. (2-tailed)	0.741	0.185	0.000		
	N	208	208	188	208	
5. TOT_D	Pearson Correlation	−0.003	0.197**	0.334**	−0.355**	1
	Sig. (2-tailed)	0.963	0.005	0.000	0.000	
	N	206	205	184	200	206
Cronbach alpha (α)				0.916	0.792	0.721

**. Correlation is significant at the 0.01 level (2-tailed)

[a]Table 4 shows the correlations among age, number of children, IPV, social support, and depression. Depression was positively associated with both IPV and number of children, while social support was negatively associated with IPV and depression. Cronbach's alpha values indicate good reliability for all scales

Theme 1. Multiple forms of violence/abuse

Our findings show overlapping forms of IPV reported by the majority of participants.

Important to note is that whereas these forms of abuse are categorized as distinct, for some women, their experiences overlapped as two or more forms of maltreatment occurred at the same time.

Psychological abuse and/or physical violence

Psychological abuse was the single most common form of spouse/partner violence reported by our participants. These ranged from subtle comments in private during domestic misunderstandings such as *"We don't fight but there are some ways that my spouse behaves like and they torture you psychologically* (Participant 7) to *"He could abuse you in public, he is naturally like that, no respect at all."* – (Participant 4) and targeted berating because of the women's HIV status such as *"Sometimes he insults me about it (HIV) yet I also don't know how I acquired it because by the time we settled together, I was negative.* (Participant 8). For a woman married to an abusive HIV negative spouse, repeated use of HIV positive status portrayed as pity, is a serious form of psychological abuse with adverse implications.

> *"He says that I cannot find any other man to stay with me apart from him because I am HIV positive and he is not. He says that he suffers taking medication yet I am the sick one; it haunts me, although he tells it to me only during a misunderstanding." (Participant 6).*

Our participants also reported escalation of psychological abuse into physical violence. *"He quarrels and abuses me. He also scratches me yet I am sick. When you tell him about rent, he gets angry..."* (Participant 3). For some women, abuse extended beyond personal verbal attacks to their biological family situation and life-threatening physical injuries.

> *"He would kick, beat, and insult me and my family saying that we had nothing...The third time he beat me I bled a lot; he got scared and rushed me to hospital." (Participant 9).*

Reports of both psychological abuse and physical violence also followed use of substances especially alcohol, by the spouse.

> *He comes back drunk and starts shouting 'take away your children, I am not the father of those children, go away,' and when you refuse to open the door, he will kick it open and then he will repair it the following morning but after slapping you" (Participant 1).*

Some experiences of psychological and/or physical abuse though unrelated to the women's HIV status, could have exacerbated the impact of HIV situation of our participants.

Psychological abuse and neglect

Our participants reported experiences of psychological abuse and neglect in their intimate relationships. These

ranged from *"…does not want you to work but again he does not give you help."* (Participant 4) to no provisions or care during vulnerable times when the women were largely dependent on their spouses due to poor physical health situations.

> *"He only thinks about his life and when he falls sick, he wants proper attention but when you fall sick, he will not even give you a Panadol." (Participant 4).*
> *"In the past I was tortured when I was pregnant like he never gave us [Mother and children] what to eat and not having anyone to help you during that time." (Participant 5).*

Sexual abuse

Sexual coercion and violence were reported, involving non-consensual sex devoid of emotional connection, resulting into feelings of powerlessness and trauma among the affected women.

> *"When he feels like he wants to sleep with me, he just comes very fast [forceful], and there is no love in it. He just forces you." – (Participant 2).*

Overall, women reported abuse and violence perpetrated by their spouses/partners starting early in their marriage or intimate relationship. For a few, their narratives suggested either very recent or ongoing abuse at the time of the interview implying increased risks of recurrent negative outcomes. Though manifesting in somewhat unique ways for individual women, the abuse generally took on multiple forms with varying effects to the victims as illustrated in the quantitative results and themes in the next section.

In the next section, we present correlation and mediation results between key variables and qualitatively show the impact of multiple forms of violence/abuse on our participants as well as how women managed or coped with IPV.

Correlation between age, number of children living, Intimate partner violence social support and depression

Quantitative data from this study revealed a significant negative correlation between social support and IPV ($r = -.269$, $p < .001$). This suggests that women who experienced higher levels of intimate partner violence tended to report lower levels of social support. Furthermore, social support was also negatively correlated with depression ($r = -.355$, $p < .001$), reinforcing its protective role in safeguarding women's mental health. While these figures are telling on their own, they gain depth and urgency when viewed alongside the qualitative theme of *"Impact of Violence/Abuse on Women Living with HIV.* Women with low social support, particularly the 6.3% identified quantitatively, often described a cumulative burden of experiences enduring psychological, physical, and sexual abuse while struggling silently with emotional distress, fear, and despair.

Depression was found to be positively associated with the number of children ($r = .197$, $p < .001$). This should not be interpreted to mean that having more children directly causes higher levels of depression. Rather, this relationship may compound the burden of IPV, as experiencing IPV within the context of higher fertility can intensify the psychological strain and exacerbate depressive symptoms.

Theme 2: impact of violence/abuse on women living with HIV

This theme helps explain the correlation results shown in the preceding section. We observed that spouse/partner abuse/violence impacted the women's emotional, physical, and psychological well-being. The abuse not only affected their daily lives but also compounded their existing challenges due to HIV as highlighted in the following sub-themes.

Psychological distress

Several negative emotions experienced by our participants were attributed to the abuse/violence perpetrated by their spouses/partners. Frustration, anger, worry and anxiety in general were reported by several women, some of whom, completed resigned and helpless about their plight due to the pervasive abuse they had endured.

"It [abuse] *affects me because if I wake up one day that I am leaving, where will I leave my children? He will not treat them well and yet even when I am around, he does not treat me as the mother of the children."* (Participant 2).

"It [abuse] took away my peace, and chased away my friends and they wonder what happened but I just tell them we are fine." (Participant 5).

The helplessness and inability to change their own situation left many women frustrated and angry. *"I don't have peace of mind, all the time. I get thoughts of leaving that home again* [previously separated]." (Participant 7).

The resultant distress affected the women's general health situation.

> *"I forget to take the medication in time just because of being angry… I feel worthless and weak, like I am sick but even when I go for a checkup it turns out negative." (Participant 6).*

Feelings worthless and suicidal thoughts

Feelings of worthlessness, despair, and sadness were expressed by several participants. These negative emotions were intensified by the stigma surrounding HIV and the rejection they experienced from their partners.

"It torments me whenever he says that if he left me no man would stay with me the way he does, it makes me feel like worthless." (Participant 6).
"Sometimes he insults me about it (HIV)… I feel dejected and worthless… I accept how he treats me, thinking that after all I am the sick one, hence I deserve it." (Participant 8).

Blaming self and feeling guilty for the HIV infection exacerbate feelings of worthlessness among the abused women.

"Time comes and I feel dejected and worthless. I start blaming myself then. Sometimes I accept how he treats me thinking that after all I am the sick one, hence I deserve it. He also blames me for infecting his son with HIV." (Participant 8).

As the intensity of feelings of worthlessness, guilt and rejection increased, contemplation of suicide by the affected women became common indicating deterioration of their mental health.

"I feel like I take overdose and I die because I don't like what the man does to me… when I sit down, I am like why don't I kill myself?" (Participant 1).
"I had so many thoughts that I lost weight… I thought about taking all the medication I was being given at the hospital so that I die." (Participant 9).

Amidst declining mental health, women also reported physical health issues and difficulty in taking the lifesaving ARVs as highlighted in the next sub-theme.

Poor adherence to ARVs and poor physical health

Our participants attributed inconsistence in taking ARVs to the experiences of abuse and violence perpetuated by their spouses/partners. Due to the psychological turmoil and the physical violence faced, difficulties were reported by some women to take their medications.

Table 5 Summary of regression analysis results[a]

			95% CI		
Model	coeff	P value	LLCI	ULCI	Rsq
Constant	68.0489	0.0000	61.4977	74.6001	0.0722
Path a	−0.2936	0.0003	−0.4493	−0.1379	
Direct effect (Path c')	0.1337	0.0009	0.0553	0.2120	0.1957
Path b	−0.1643	0.0000	−0.2360	−0.0926	
Total effect (Path c)	0.1819	0.0000	0.1024	0.2614	0.1028
Indirect path (Path a*b)	0.0483		0.0196	0.0965	

[a]Table 5 summarizes the regression and mediation analysis results. Path a reflects the association of IPV on social support, Path b shows the association of social support on depression, and Path c' represents the direct effect of IPV on depression controlling for social support. The total effect (Path c) and the indirect effect (a×b) indicate the overall and mediated relationships. Confidence intervals and R^2 values show the precision and explanatory power of the models

"Sometimes I take it (medicine) and other days I don't. Sometimes I lack what to eat therefore I miss taking the medication for several days. Other times my spouse beats me and I become very weak and decide not to take the medication." (participant 10).

Poor adherence on ARVs might have contributed to the women's poor general physical health including new infections and illnesses.

"I became too weak to the point that when I went back to hospital, I found out that I had cancer. I do not know how and when I got it. I am suffering from it even now." (Participant 9).

Those experiences of abuse and their implications required women to develop mechanisms of managing or coping with their circumstances.

Regression analysis

Regression analysis from Table 5 revealed significant associations among intimate partner violence (IPV), social support, and depression among women living with HIV/AIDS. Higher levels of IPV were significantly linked to decreased social support (β = −0.2936, p <.001). In turn, lower social support was significantly associated with higher levels of depression (β = −0.1643, p <.001). Despite accounting for social support, IPV continued to have a significant direct association on depression (β = 0.1337, p =.0009), indicating that IPV independently exacerbates mental health challenges. The total effect of IPV on depression was also significant (β = 0.1819, p <.001). Importantly, the analysis demonstrated a significant indirect effect of IPV on depression mediated through social support (β = 0.0483, 95% CI [0.0196, 0.0965]), confirming that social support partially mediates this relationship.

Figure 1 represents a mediation model examining the relationships among Intimate Partner Violence (IV), Social Support (mediating variable), and Depression (DV). Path a (Intimate Partner Violence to Social Support) represents the direct association of Intimate Partner Violence (IPV) on Social Support. Path b (Social Support to Depression) represents the direct association of Social Support on Depression. Path c (Intimate Partner Violence to Depression) represents the total association of Intimate Partner Violence on Depression before considering the mediating effect of Social Support. Path c' (Direct effect of Intimate Partner Violence on Depression, controlling for Social Support) represents the direct effect of Intimate Partner Violence on Depression when accounting for the mediating effect of Social Support.

This mediation model quantitatively confirms that IPV reduces social support, which then contributes to

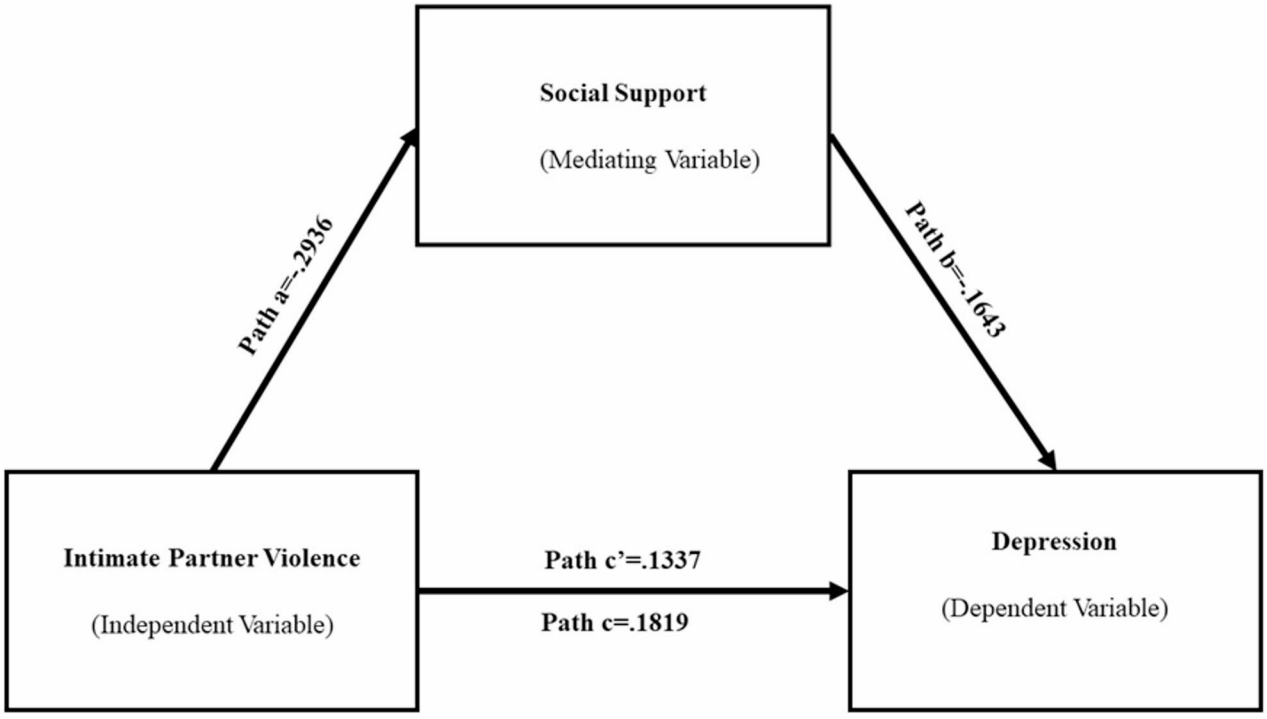

Fig. 1 Showing mediation pathways

increased depression among women living with HIV. Complementing these findings, qualitative narratives illustrate how the absence of social support intensifies women's feelings of helplessness and psychological distress. Conversely, emotional and practical support from family, friends, and health workers emerges as a vital resource that enables women to cope with abuse and fosters hope for recovery and resilience. Together, these quantitative and qualitative findings highlight the critical role of social support as both a buffer against the harmful effects of IPV and a target for interventions aimed at improving mental health outcomes in this vulnerable population.

Managing and coping with violence/abuse

This final theme explains the role of social support in the relationship between IPV and depression and its associated negative experiences. Faced with continuous spouse/partner violence and abuse, many women demonstrated resilience and sought ways to cope through individual strategies, informal support and in some cases, formal health care services.

Helplessly enduring violence/abuse

Some of our participants amidst their experiences of violence and abuse by their spouses reported helplessness in controlling their situations. They faced experiences of neglect through resignation. *"Whenever I lack what to eat, I shut myself inside the house… I have never asked for help from anyone… I tried talking to a nurse, but she seemed busy"* (Participant 8). Violence or abuse on the other hand was endured by those who thought they had no one to support them. Such general helplessness can increase risks to poor mental health including depression.

> *"Just endure because I have nothing to do. In my family I was born alone I cannot go anywhere; my mother and father are not there." (Participant 3).*

Self-encouragement and being hopeful

A few women encouraged themselves and chose to be hopeful in the face of spouse/partner violence and abuse. Acknowledging their negative experiences while tapping intrapersonal strength helped some women to manage the abuse suffered. Looking at abuse as temporally was another way women encouraged themselves to live through their challenging experiences.

> *"I have it in mind that the situation I am going through is not permanent. That one time I will overcome this and move forward." (Participant 5).*

Determined to live positively and look after self and their families, *"I try my best to take my drugs even when we have quarrelled because I know it is this drug which will help me to live and look after my children."* (Participant 2). Additionally, focusing on a few positives in

their relationships and family circumstances kept some women strong despite the recurrent abuse. By weighing their options through comparing what they currently had and what they would miss, some women intentionally decided to stay in abusive relationships.

> *"I just encourage myself to live on, I don't have a considerable support system so I choose to stay with this man other than going elsewhere and starting from scratch, after all he has a home". (Participant 10).*

Others, however, encouraged themselves to pursue autonomy away from abusive spouses.

> *"I convinced myself that my future is to work hard and even when the father of this child called me, I could not pick because what comes out of that call is bad and that has helped me to avoid certain things because even after giving birth, I rested for three weeks and started looking for what to do. I do not have someone to employ me but I started my small business of cooking porridge at home." (Participant 5).*

Support from family, friends and health workers

Several participants found solace in family members, especially their mothers or best friends, due to previous betrayals by others.

> *"I only trust my mother no one else. Even my own friends betray me." (Participant 1).*
> *"Sharing with my friends is what has mainly helped me because they advise me on what to do; I could never have kept quiet with all that he does but my friends have helped me a lot." (Participant 7).*

Some women benefited from counselling and support from healthcare providers and community workers, which provided emotional reassurance and practical guidance.

> *"The medical workers have also helped me to go through this situation. They advise me on what to do, they tell me to get used to taking the medication." (Participant 6).*

Financial independence key to women's wellbeing

The majority of our participants attributed their experience of IPV to their financial vulnerabilities noting that *"I feel my life is like this because I don't work, if I was working, I wouldn't be in that situation."* (Participant 7). A recurring theme was thus the women's desire for financial empowerment to break free from dependency and gain self-worth.

> *"If I had enough money… the man would respect me." (Participant 2).*
> *"I am looking for support that can push me forward where I can get food and school fees for the children." (Participant 5).*

In the absence of financial independence and with limited social and professional support amidst ongoing multiple forms of spouse/partner violence, our participants faced higher risks of poor mental health especially depression as shown in all our findings.

Discussion

This sequential explanatory mixed methods study examined the association between IPV, social support and depression among WLHIV in central Uganda. Results show a substantial number of participants experiencing IPV and depression. The majority of our participants reported moderate or higher levels of perceived social support. Both quantitative and qualitative results show the important role of social support in the relationship between IVP and depression among vulnerable WLHIV.

The high prevalence of depression is supported by recent meta-analyses reporting pooled prevalence rates around 30.2% among Ugandans [3] and population-based surveys of depressive symptoms [40]. This high level of depression in particular as well as experiences of poor general mental and physical health attributed to IPV raise major concerns about the overall impact of HIV care currently received by WLHIV in central Uganda. For example, our qualitative results show challenges with adherence to ART linked to the women's experiences of IPV similar to findings by D Thomas.et al. [41].Experiences of multiple forms of IPV such as those reported by our participants are known to increase risks of depression [42] further compromising adherence to ART [43] and impacting on physical health [44]. With recurrent experiences of IPV and the resultant negative sequel, poor mental health becomes a risk factor for further abuse as seen in our qualitative findings. Helplessness became more pronounced by participants who reported little or no social support.

Despite the majority of our participants reporting moderate to higher levels of social support, qualitative findings revealed women facing serious IPV and associated psychological or emotional challenges due to limited social support. Interrogation of the nature and forms of social support [45] received or desired by our participants can provide understanding of the essential role of social support in buffering the effects of IPV. Amidst pervasive mistrust in part due to HIV stigma, lack of support was a recurrent theme intensifying stress and vulnerability to poor mental health among our participants similar

to findings by [46]. Indeed, social support significantly mediated the relationship between IPV and depression in our sample with experiences of low perceived social support characterizing the severe effects of ongoing IPV on the women's mental health including suicidal ideations. Our qualitative findings illustrate how persistent psychological distress associated with diverse experiences of IPV and low social support exacerbated feelings of worthlessness and suicidal ideation. These insights complement epidemiological evidence showing that although the prevalence of depression may vary geographically and socioeconomically, it remains of significant burden in this population [47, 48].

The women's dependence on spouses for financial support exacerbated the impact of IPV on their emotional wellbeing. Several qualitative interview participants reported enduring IPV in part because of absence of alternative sources of financial support. For those women, socioeconomic deprivation was thus a key contributing factor for IPV and its ramifications among the abuse women. Availability of the multidimensional nature of social support encompassing emotional, instrumental, informational, and appraisal [45] was echoed in qualitative reports of emotional encouragement, practical assistance, and the sense of belonging provided by family, friends, and healthcare workers.

Moreover, the mediation analysis demonstrated that social support partially mediates the relationship between IPV and depression, suggesting it functions as a buffer mitigating the psychological harm of violence. This aligns with qualitative themes where women described social support as a critical mechanism enabling them to cope with abuse, maintain hope, and engage in care. These findings mirror prior research underscoring the buffering effect of social support against IPV-related depression [17, 49]. In this context, social support emerges as a crucial factor in mediating the relationship between IPV and depression. Specifically, findings suggest that the effect of IPV on depression operates, in part, through its impact on social support. Women experiencing higher levels of IPV tend to have reduced access to social support, which, in turn, contributes to higher levels of depression.

In sum, the integration of quantitative and qualitative data provides a nuanced understanding of the interconnectedness of IPV, social support, and depression among WLHIV. While many women experience mild to moderate depressive symptoms and varying levels of IPV, those with inadequate social support face compounded risks. The qualitative insights illuminate the lived realities behind the statistics, emphasizing the importance of tailored interventions that strengthen social networks, address stigma, and enhance economic independence to improve mental health and overall wellbeing in this vulnerable population.

Study limitations

The focus on a few women with a history of IPV in the qualitative strand of this study meant that the experiences of the majority of our participants on social support and depression were not examined. We therefore cannot address ourselves to protective factors for depression in our sample including the nature and forms of social support at moderate and higher levels, reported by the majority of our participants. However, the detailed examination of IPV and its impact on WLHIV has enhanced our understanding of risks faced by this vulnerable population.

The study relied on self-report measures for assessing intimate partner violence, social support, and depression. Self-report measures are subject to recall bias and social desirability 58 bias, which impact the accuracy of the data collected and because of that some questions were not answered because of their nature affecting data quality. The study focused on a specific population of women living with HIV/AIDS, which may limit the generalizability of the findings to other populations or contexts. The results may not be applicable to men, individuals without HIV/AIDS, or different cultural and socioeconomic contexts.

Despite evidence of substantial levels of IPV and depression among our sample, we cannot confirm causality due to the cross-sectional nature of our study. Our mixed methods findings can however contribute to the necessary interventions aimed at reduction of both IPV and depression among this population.

Recommendations

Culturally sensitive interventions are essential to address the impact of intimate partner violence (IPV) on mental health and ART adherence among women living with HIV (WLHIV). Training primary healthcare workers to assess IPV and mental health, coupled with routine screening within HIV services, would enable early detection and timely response. Integrating basic mental health care into HIV packages, with referral pathways for severe cases, alongside research on economic empowerment as a strategy to reduce IPV vulnerabilities, could strengthen adherence and improve overall well-being.

Collaboration between healthcare providers, community organizations, and advocacy groups is crucial to address the multifaceted needs of women living with HIV/AIDS who have experienced IPV. By working together, these stakeholders can provide comprehensive support services, raise awareness, advocate for policy changes, and develop sustainable interventions.

Policymakers should be encouraged to develop and implement policies that address IPV and mental health concerns among women living with HIV/AIDS. This can include allocating resources for support services,

establishing guidelines for healthcare providers, and promoting a coordinated response to IPV within the healthcare system.

Conclusion

This sequential explanatory mixed-methods study highlights the complex interplay between intimate partner violence, limited social support, and depression among women living with HIV. The findings reinforce evidence that IPV substantially contributes to the high burden of depression, while inadequate partner support further undermines ART adherence. These intersecting vulnerabilities place affected women at heightened risk of poor physical and mental health outcomes, with profound implications for quality of life. The absence of structured mental health services within most HIV care settings in resource-limited contexts remains a critical barrier to comprehensive care. Interventions that integrate IPV prevention, strengthen social and economic support systems, and embed mental health services within the HIV cascade are essential for optimizing treatment outcomes and advancing the well-being of women living with HIV. While these results provide important insights, future research should build on this foundation by employing longitudinal or quasi-experimental designs that can more rigorously assess causal pathways. Establishing temporal and causal relationships between IPV, social support, depression, and HIV treatment outcomes would strengthen the evidence base and guide more targeted intervention strategies. Future research could provide more support for the findings in this study and then strengthen policy recommendations.

Abbreviations

IPV	Intimate partner violence
HIV	Human immunodeficiency virus
AIDs	Acquired immunodeficiency syndrome
WLHIV	Women Living with Human immunodeficiency virus
ART	Anti Retroviral Therapy
DV	Dependant Variable
IV	Independent Variable
MV	Mediating Variable
PLHIV	People Living with Human immunodeficiency virus

Supplementary Information

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Supplementary Material 1.

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Authors' contributions

Joan Nalunkuuma 1* (JN), Deborah Ojiambo 1 (DO), Joanita Nangendo 3 (NJ), Fred C. Semitala 2 (FCS) and Samuel Ouma 1 (SO). JN, DO and SO contributed to study conceptualization, JN, SO, DO and NJ analyzed results, NJ, DO and SO manuscript preparation, NJ and FCS edited the manuscript. All authors reviewed the manuscript.

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Data availability

We used or generated research data in this study. Qualitative data supporting this study have been uploaded at Mendeley Data, V1, https://doi.org/10.17632/bkkmwdw2my.1.

Declarations

Ethics approval and consent to participate

The study protocol was reviewed for ethical standards and approved by the Makerere University School of Health Sciences Research and Ethics Committee (MAKSHSREC-2024-666) in accordance to the standards of the Uganda National Council for Science and Technology (UNCST). Following administrative approval from the management of the study health facility, the first author approached women attending the ART clinic and gave them information about the study. Written informed consent was obtained from all eligible participants before completing the questionnaires. Additionally, participants for the qualitative strand signed a second consent form before individual interviews. The study adhered to the Declaration of Helsinki.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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