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Intimate partner violence typology and major depressive disorder among postpartum adolescents in Central Uganda: a cross-sectional study

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Abstract

Background Depression affects 26.9% of pregnant and postpartum mothers, while 39.6% of women in Ugandan women experience intimate partner violence (IPV). Adolescents (10–18 years) are at higher risk for depression and its complications compared to other age groups. Our objective is to examine the association between IPV forms (typology) and major depressive disorder (MDD) among adolescents attending postnatal care (PNC) clinic in Kampala, Uganda.

Methods We conducted a health facility-based, cross-sectional study among 200 consenting adolescents below 19 years attending a non-profit postnatal care (PNC) clinic in Kampala, Uganda. Trained psychiatric clinical officers administered the 20-item Center for Epidemiologic Studies Depression Scale to assess depressive symptoms and conducted MINI-KID diagnostic interviews to confirm MDD. We examined three IPV typologies: physical, sexual, and emotional IPV. Using logistic regression, we tested the independent associations between IPV typologies and MDD, adjusting for potential confounders, and reported odds ratios (OR) with corresponding 95% confidence intervals (95%CI).

Results Among 200 study participants, the mean age was 16.1 years (SD = 3.4), 6.0% met criteria for MDD, 54.0% experienced at least one IPV form, 45.0% reported emotional IPV, 18.0% reported sexual IPV, and 37.5% reported physical IPV. After adjusting for potential confounders, participants who experienced emotional IPV had significantly higher odds of MDD (AOR = 9.8, 95%CI 5.6–14.3, $p = 0.014$) compared to those without emotional IPV exposure. Sexual IPV showed significantly higher odds of MDD (AOR = 8.6, 95%CI 1.1–13.9, $p = 0.04$) compared to no sexual IPV exposure.

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Conclusions Emotional and sexual IPV were significantly associated with MDD among postpartum adolescents. Our findings highlight the need to strengthen routine IPV and mental health screening in PNC settings, with clear referral pathways to support and response services.

Clinical Trial Number Not applicable.

Keywords Depression, Postpartum, Adolescents, Uganda, Violence

Background

Depression is a leading global mental health disorder, significantly affecting the health and well-being of women during the perinatal and postpartum periods [1, 2]. Globally, the prevalence of depression among pregnant or postpartum mothers is estimated at 17.7%, with variations observed across regions and populations [3]. This high burden of depression contributes to high morbidity and disability. In Uganda, the burden of postpartum depression is higher, affecting 26.9% of mothers, compounded by a high prevalence of intimate partner violence (IPV). [4] The lifetime prevalence of IPV perpetrated against ever-married/partnered women by their current/former male partner or husband is higher in the African region at 33% when compared to the global estimates at 27% [5]. Approximately, two out of five (39.6%) of all women report exposure to at least one form of IPV [6]. Adolescents in particular are a vulnerable population that face an even greater risk for depression and its complications compared to adult women due to intersecting social, biological, and economic factors [1]. Adolescent mothers may be vulnerable to severe depressive symptoms because of unwanted pregnancies, poverty, stigmas surrounding mental health and IPV among others. Suicidal and homicidal thoughts are key aspects of postpartum depression, posing significant risks to the mother, her partner, and baby. Poor relationship quality, IPV, and financial instability further worsen the emotional distress of affected mothers [7].

Evidence from Sub-Saharan Africa (SSA) shows that physical and psychological IPV during pregnancy significantly increases the risk of postpartum depression, as demonstrated by studies in Ethiopia [8], Kenya [9], Tanzania [10], and Zambia [11]. In Rwanda, psychological and sexual IPV typologies, as revealed by partner's controlling behaviors, were associated with postpartum depression [12]. Similarly, a study from South Africa indicated that physical IPV during pregnancy was associated with a higher risk of postpartum depression (PPD) [13], including a 12.3% increase in depression symptoms with IPV severity or intensity [14]. These patterns underscore the pervasive impact of IPV on maternal mental health across SSA. However, despite consistent associations between IPV and depressive symptoms, some variations exist. For example, one South African study found no significant association between IPV victimization among pregnant adolescents and PPD [15], suggesting that contextual and demographic factors may influence mental health outcomes. Additionally, research from Uganda has shown that IPV exposure adversely affects maternal health service utilization [16, 17]. This highlights the urgent need for context-specific interventions to address the mental health consequences among women in the region.

IPV remains a substantial public health issue in Uganda, with emotional, physical, and sexual IPV commonly reported among adolescents and young women [6]. While IPV alone has been recognized as a key risk factor for depression, adolescent mothers are disproportionately affected, as they often experience multiple forms of IPV during pregnancy and the postpartum period. These experiences can exacerbate the onset and severity of major depressive disorder (MDD), creating long-term adverse effects on both maternal and child health [18]. Despite the clear implications, limited studies have focused on the relationship between IPV and depression among postpartum adolescent mothers in urban Ugandan settings. Determining factors that impact severity of depression among adolescent mothers is needed to better understand, identify, and treat depression in adolescent mothers.

The adolescent population (10–18 years) is particularly vulnerable to IPV, as their limited decision-making autonomy, early entry into motherhood, and low access to healthcare services further amplifies their exposure to violence and mental health complications [19, 20]. Data on the typologies of IPV, namely, emotional, sexual, and physical IPV, and their relationship with MDD in this group remain sparse. Addressing this knowledge gap is essential for developing targeted screening and intervention strategies to address IPV and depression among adolescent mothers in Uganda. This study examined the association between IPV typologies and MDD among adolescent mothers attending postnatal care in Kampala, Uganda, to inform integrated screening and intervention strategies addressing IPV and related mental health risks.

Methods

Study design, setting, and population

This health facility-based, cross-sectional study was conducted at the Child and Family Foundation Uganda (CFU) Medical Center in Kawempe Division, Kampala,

Uganda, from June to August 2023. Adolescent mothers below the age of 19 years attending the postnatal/immunization clinic at the CFU medical center with their biological children were approached after participating in general group health education sessions at the CFU outpatient unit. Informed consent was obtained by trained research assistants and was obtained from all study participants who were adolescents with biological children. According to Uganda National Council for Science and Technology (UNCST) guidelines, adolescent mothers with biological children are classified as emancipated minors and are therefore permitted to provide their own consent. The study included participants who were less than 19 years of age, self-identified as women, had at least one child, and were seeking postnatal care at CFU.

Sample size, sampling strategy, and data collection methods

Our initial power calculation estimated a sample of 227 participants to detect associations between any IPV exposure (composite measure) and MDD, assuming an expected MDD prevalence of 6%, based on a prior study in Uganda, and an expected IPV exposure of 40%, power of 80%, and alpha of 0.05. We initially screened a total of 227 adolescent mothers using the Center for Epidemiologic Studies Depression Scale (CES-D), a depression screening tool. We were approved to administer only 200 MINI-KID diagnostic interviews. Therefore, to ensure random selection, we employed a lottery-style method in which each participant drew a slip from 227 similarly labeled papers among which 27 contained unique marks. Selection was done with replacement of the drawn pieces. Participants who drew slips with the unique mark were excluded from the MINI-KID administration, resulting in 200 participants completing both the CES-D and MINI-KID. These 200 participants completed the Mini International Neuropsychiatric Interview-KID (MINI-KID), a diagnostic interview used to confirm major depressive disorder (MDD). Interviewer-administered data collection tools were used to collect socio-demographic information using pretested survey questionnaires. MDD was confirmed using the MINI-KID, administered by psychiatric clinical officers (PCOs) trained and experienced in its use.

Patients were recruited from the postnatal clinic at the CFU clinic. Trained research assistants obtained informed consent from eligible participants and scheduled a 45-minute time slot to complete the study procedure. Research assistants, including two CFU clinic nurses and two medical students from the Medical College of Wisconsin (MCW), were trained to administer the demographics and IPV exposure survey while experienced PCOs administered the MINI-KID after the survey. All participants were initially administered the survey by the trained research assistants/medical students. Thereafter, participants were walked to the PCOs interview room to have the MINI-KID interview conducted. The interviews which identified any depression disorder were reviewed by a psychiatrist to confirm the diagnosis. Participants diagnosed with MDD during the assessments were then referred to a psychiatrist at CFU Medical center for further management. Other study patients were linked to routine care provided within the mental health clinic or CFU primary care providers, respectively.

Study measures

The outcome variable was major depressive disorder, a binary categorical variable (no/yes) diagnosed by the MINI-KID. In this study, MDD was defined as the presence of five or more depressive symptoms over at least two weeks that led to significant impairment in daily functioning, whereas depressive symptomatology referred to having symptoms that did not fully meet these criteria. The key independent variables were IPV typology that included physical (no/yes), sexual (no/yes), and emotional IPV (no/yes). We defined IPV exposure as experiencing at least one type of intimate partner violence, namely; physical, emotional, or sexual in the past twelve months using measures similar to prior Ugandan studies we conducted [16, 17, 21].

Specifically, for **physical IPV**, participants answered yes/no to whether their current or most recent partner had, in the past twelve months, ever "pushed," "shaken or thrown something at them," "slapped," "fist punched or hit with something harmful," "kicked or dragged," "strangled or burned," "threatened with a knife/gun or other weapon," or "twisted an arm or pulled hair." Reporting any item was coded as "Yes." For **emotional IPV**, participants indicated yes/no if, in the past twelve months, their partner had ever "humiliated," "threatened with harm," or "insulted or made them feel bad." Any positive response resulted in a "Yes" coding. For **sexual IPV**, participants responded yes/no to whether, in the past twelve months, their partner had ever "physically forced them into unwanted sex," "forced them into other unwanted sexual acts," or "physically forced them to perform sexual acts when they did not want to." Any endorsement was coded as "Yes." Any (total) IPV was defined as experiencing any physical, emotional, or sexual IPV in the twelve months preceding each survey. Women reporting any form were coded "Yes"; those reporting none were coded "No."

For the study covariates, socio-demographic data were maternal-related variables included age in years (continuous variable), household income (household wealth index based on UDHS measures), gravidity (number of times participant got pregnant regardless of outcome), employed (yes/no), marital status (currently/ever/never

married), unintended pregnancy (yes/no), self-reported substance use (yes/no), complications during childbirth (yes/no), contraceptive/birth control method used (long acting, short acting, none), and covert contraceptive use (yes/no).

Statistical analysis

Descriptive statistics were used to summarize participants' socio-demographic characteristics, including MINI-KID scores. Chi-square tests examined differences between participant characteristics and MDD. Student T-tests compared mean CESD-20 scores between exposed and non-exposed groups for each IPV typology. At bivariate analyses, logistic regression models were used to test the unadjusted association between independent variables and the outcome (MDD). Our inclusion criteria for covariate into the adjusted model, was based on variables with a cut-off p-value ≤ 0.05 in the unadjusted model, prior literature [22–24], and biologically plausible factors such as age associated depression. Multicollinearity tests revealed low correlations between all covariates except IPV typologies. Physical IPV moderately correlated with emotional and sexual IPV respectively, therefore, we included physical IPV in the adjusted model accordingly. Adjusted logistic regression was used to test the independent association between IPV typologies (sexual, physical, and emotional forms) and MDD while controlling for potential confounders. Statistical significance was set at p-values less than 0.05. We conducted a sensitivity analysis restricted to adolescents who reported being currently or ever married, using this subgroup as a proxy for recent intimate relationships. This approach aimed to minimize potential misclassification of IPV exposure among participants without recent partners.

We conducted sensitivity analyses to assess the robustness of our findings. First, we restricted analyses to adolescents who reported being currently or ever married ($n = 144$), using this subgroup as a proxy for recent intimate relationships to minimize potential misclassification of IPV exposure among participants without recent partners. This sensitivity analysis was conducted for the adjusted model (Supplementary Table 1).

Results

In our overall study sample ($N = 200$) as shown in Table 1, the mean age was 16.1 years (SD ± 3.4), 6.0% ($n = 12$) had MDD, 80.5% ($n = 161$) were unemployed, 50.5% ($n = 101$) were currently married, 41.5% ($n = 83$) had secondary education or higher, and 54.0% ($n = 108$) experienced at least one IPV form. Emotional IPV was reported by 45.0% ($n = 90$), sexual IPV by 18.0% ($n = 36$), and physical IPV by 37.5% ($n = 75$) of our study population. Among the study participants, 65.5% ($n = 131$) had an unintended pregnancy, 11.5% ($n = 23$) covertly used contraceptives (partner/husband not being aware), 37.5% ($n = 75$) reported pregnancy complications, and 44.5% ($n = 89$) were using short-acting contraceptives. For participants with MDD ($n = 12$), their mean age was 16.3 years (SD ± 3.5), mean gravidity was 1.3 (SD ± 0.5), 9.3% experienced at least one IPV form, 5.6% experienced emotional IPV, 19.4% experienced sexual IPV, 12.0% experienced physical IPV, 8.4% had unintended pregnancies, and 8.7% used covert contraceptive methods. The mean ± SD CESD-20 score was significantly higher among those who experienced emotional IPV (24.9 ± 11.3 vs 19.0 ± 11.5, $p < 0.001$), sexual IPV (26.7 ± 11.8 vs 20.9 ± 11.5, $p = 0.009$), and physical IPV (26.1 ± 10.9 vs 19.0 ± 11.5, $p < 0.001$) compared to those who did not (Supplementary Table 2).

From Table 2, emotional, sexual, and physical IPV were each significantly associated with higher depressive symptom severity. Participants with emotional IPV exposure had higher mean CESD-20 scores (Mean 24.87, SD±11.34) compared to those not exposed (Mean 19.04, SD±11.52, $p < 0.001$). Similarly, those who experienced sexual IPV reported higher depressive symptoms (Mean 26.66, SD±11.79) than participants not exposed to sexual IPV (Mean 20.93, SD±11.53, $p < 0.001$). Physical IPV was also associated with significantly higher CESD-20 scores (Mean 26.10, SD±10.93) compared to those without physical IPV exposure (Mean 19.01, SD±11.50, $p < 0.001$).

In unadjusted analyses (Table 3), women exposed to sexual IPV have 6.86 times the odds of MDD compared to those not exposed (OR = 6.86, 95%CI 2.03–13.18, $p = 0.002$). Physical IPV was also significantly associated with MDD (OR = 4.77, 95%CI 1.24–8.34, $p = 0.023$). Additionally, substance use was associated with higher odds of MDD (OR = 5.27, 95%CI 1.41–9.63, $p = 0.013$). In sensitivity analyses among adolescents who were currently or ever married, sexual IPV remained significantly associated with MDD (OR = 6.10, 95%CI 1.15–32.41, $p = 0.034$). Emotional IPV showed a marginal association (OR = 2.11, 95%CI 0.94–4.72, p=0.069) while physical IPV showed no significant association (OR = 3.23, 95%CI 0.57–18.30; $p = 0.186$).

Table 4 shows the factors associated with MDD in our study sample of adolescents attending PNC. Participants who experienced emotional IPV had significantly higher odds of MDD (AOR = 9.8, 95%CI 5.6–14.3, $p = 0.014$) when compared to no emotional IPV, whereas sexual IPV had significantly higher odds of MDD (AOR = 8.6, 95%CI 1.1–13.9, $p = 0.04$) when compared to no sexual IPV after adjusting for potential confounders. In the sensitivity analyses restricted to adolescents who were currently or ever married ($n = 144$), all IPV typologies were associated with higher odds of MDD though not statistically significant (Supplementary Table 1).

Table 1 Participant socio-demographic characteristics, $N = 200$

Characteristic	Total	Major depressive disorder		pvalue
		No	Yes	
	n(%)*	n(%)**	n(%)**	
		188 (94.0%)	12 (6.0%)	
Age (years) Mean ± SD, $N = 191$	16.14 ± 3.39	16.13 ± 3.39	16.29 ± 3.48	0.877
Parity Mean ± SD, $N = 184$	1.21 ± 0.47	1.20 ± 0.47	1.33 ± 0.49	0.333
Marital Status				
Currently married	101 (50.5%)	96 (95.1%)	5 (4.9%)	0.408
Never married	55 (27.5%)	49 (89.1%)	6 (10.9%)	
Ever married	35 (17.5%)	34 (97.1%)	1 (2.9%)	
Missing	9 (4.5%)	9 (100.0%)	0 (0.0%)	
Education				
Secondary+	83 (41.5%)	76 (91.6%)	7 (8.4%)	0.697
Primary	90 (45.0%)	85 (94.4%)	5 (5.6%)	
None	16 (8.0%)	16 (100.0%)	0 (0.0%)	
Missing	11 (5.5%)	11 (100.0%)	0 (0.0%)	
Employment				
Employed	39 (19.5%)	36 (92.3%)	3 (7.7%)	0.706
Unemployed	161 (80.5%)	152 (94.4%)	9 (5.6%)	
Household Wealth Quintile				
Poorest	46 (23.0%)	44 (95.7%)	2 (4.3%)	0.447
Poor	39 (19.5%)	36 (92.3%)	3 (7.7%)	
Medium	52 (26.0%)	48 (92.3%)	4 (7.7%)	
Wealthy	32 (16.0%)	32 (100.0%)	0 (0.0%)	
Wealthiest	31 (15.5%)	28 (90.3%)	3 (9.7%)	
Any IPV form				
No	75 (37.5%)	73 (97.3%)	2 (2.7%)	0.152
Yes	108 (54.0%)	98 (90.7%)	10 (9.3%)	
Missing	17 (8.5%)	17 (100.0%)	0 (0.0%)	
Emotional IPV				
No	93 (46.5%)	86 (92.5%)	7 (7.5%)	0.739
Yes	90 (45.0%)	85 (94.4%)	5 (5.6%)	
Missing	17 (8.5%)	17 (100.0%)	0 (0.0%)	
Sexual IPV				
No	147 (73.5%)	142 (96.6%)	5 (3.4%)	0.003
Yes	36 (18.0%)	29 (80.6%)	7 (19.4%)	
Missing	17 (8.5%)	17 (100.0%)	0 (0.0%)	
Physical IPV				
No	108 (54.0%)	105 (97.2%)	3 (2.8%)	0.029
Yes	75 (37.5%)	66 (88.0%)	9 (12.0%)	
Missing	17 (8.5%)	17 (100.0%)	0 (0.0%)	
Pregnancy Intention				
Intended	55 (27.5%)	54 (98.2%)	1 (1.8%)	0.167
Unintended	131 (65.5%)	120 (91.6%)	11 (8.4%)	
Missing	14 (7.0%)	14 (100.0%)	0 (0.0%)	
Substance Use				
No	166 (83.0%)	158 (95.2%)	8 (4.8%)	0.027
Yes	19 (9.5%)	15 (78.9%)	4 (21.1%)	
Missing	15 (7.5%)	15 (100.0%)	0 (0.0%)	
Covert contraceptive use				
No	96 (48.0%)	91 (94.8%)	5 (5.2%)	0.761
Yes	23 (11.5%)	21 (91.3%)	2 (8.7%)	
Missing	81 (40.5%)	76 (93.8%)	5 (6.2%)	

Table 1 (continued)

Characteristic	Total	Major depressive disorder		pvalue
		No	Yes	
	n(%)*	n(%)**	n(%)**	
		188 (94.0%)	12 (6.0%)	
Complications during childbirth				
No	114 (57.0%)	109 (95.6%)	5 (4.4%)	0.321
Yes	75 (37.5%)	68 (90.7%)	7 (9.3%)	
Missing	11 (5.5%)	11 (100.0%)	0 (0.0%)	
Contraceptive method				
Long acting	94 (47.0%)	90 (95.7%)	4 (4.3%)	0.301
Short acting	89 (44.5%)	81 (91.0%)	8 (9.0%)	
None	17 (8.5%)	17 (100.0%)	0 (0.0%)	

*Column percentages, ** Row percentages

Table 2 Comparison of CESD-20 depression scores by intimate partner violence typology

	Emotional IPV			Sexual IPV			Physical IPV		
	No	Yes		No	Yes		No	Yes	
CESD-20	**Mean (SD)**	**Mean (SD)**	**p**	**Mean (SD)**	**Mean (SD)**	**p**	**Mean (SD)**	**Mean (SD)**	**p**
Overall CESD-20 score	19.04 (11.52)	24.87 (11.34)	< 0.001	20.93 (11.53)	26.66 (11.79)	< 0.001	19.01 (11.50)	26.10 (10.93)	< 0.001
CESD-20 items									
I was bothered by things that usually don't bother me.	0.74 (1.00)	1.19 (1.08)	0.003	0.91 (1.03)	1.28 (1.14)	0.059	0.85 (1.06)	1.14 (1.04)	0.058
I did not feel like eating; my appetite was poor.	0.94 (1.02)	1.19 (1.13)	0.1	1.08 (1.08)	1.00 (1.09)	0.669	0.92 (1.02)	1.26 (1.13)	0.026
I felt that I could not shake off the blues even with help from my family or friends.	0.72 (1.01)	1.15 (1.12)	0.004	0.85 (1.03)	1.35 (1.25)	0.011	0.77 (1.01)	1.17 (1.15)	0.009
I felt that I was just as good as other people.	0.81 (0.92)	1.35 (1.11)	< 0.001	1.02 (1.02)	1.39 (1.17)	0.047	1.00 (1.01)	1.20 (1.11)	0.17
I had trouble keeping my mind on what I was doing.	0.95 (1.15)	1.39 (1.10)	0.005	1.13 (1.13)	1.42 (1.18)	0.149	1.01 (1.14)	1.41 (1.10)	0.012
I felt depressed.	1.09 (1.07)	1.36 (1.12)	0.087	1.15 (1.08)	1.58 (1.11)	0.029	1.13 (1.05)	1.36 (1.15)	0.129
I felt that everything I did was an effort.	0.79 (1.10)	1.08 (1.07)	0.05	0.84 (1.04)	1.37 (1.20)	0.007	0.78 (1.03)	1.16 (1.13)	0.013
I felt hopeful about the future.	0.78 (1.00)	1.37 (1.21)	< 0.001	0.96 (1.09)	1.62 (1.23)	0.001	0.86 (1.04)	1.39 (1.21)	0.001
I felt fearful.	1.01 (1.21)	1.15 (1.12)	0.388	1.04 (1.17)	1.29 (1.11)	0.226	1.02 (1.20)	1.17 (1.10)	0.346
My sleep was restless.	1.15 (1.11)	1.04 (1.07)	0.456	1.11 (1.08)	1.03 (1.15)	0.678	0.98 (1.02)	1.24 (1.16)	0.096
I was happy.	1.06 (1.17)	1.37 (1.24)	0.067	1.21 (1.20)	1.29 (1.29)	0.72	1.03 (1.17)	1.49 (1.23)	0.006
I felt lonely.	1.03 (1.12)	1.28 (1.15)	0.113	1.14 (1.11)	1.26 (1.27)	0.542	1.02 (1.08)	1.35 (1.19)	0.037
People were unfriendly.	1.32 (1.26)	1.34 (1.22)	0.893	1.33 (1.24)	1.32 (1.23)	0.982	1.24 (1.23)	1.45 (1.24)	0.232
I enjoyed life.	0.94 (1.10)	1.19 (1.14)	0.115	1.00 (1.07)	1.37 (1.30)	0.068	0.89 (1.06)	1.31 (1.17)	0.008
I had crying spells.	1.20 (1.15)	1.36 (1.14)	0.33	1.25 (1.16)	1.39 (1.10)	0.498	1.06 (1.12)	1.57 (1.12)	0.001
I felt sad.	0.98 (1.12)	1.25 (1.17)	0.098	1.05 (1.10)	1.39 (1.31)	0.099	0.85 (1.05)	1.47 (1.18)	< 0.001
I felt that people disliked me.	1.06 (1.10)	1.18 (1.10)	0.445	1.08 (1.05)	1.29 (1.27)	0.296	1.02 (1.08)	1.26 (1.11)	0.113
I could not get "going."	1.21 (1.17)	1.37 (1.25)	0.347	1.22 (1.19)	1.63 (1.26)	0.059	1.26 (1.18)	1.35 (1.26)	0.576
I felt life was not worth living.	1.16 (1.23)	0.85 (1.06)	0.051	1.04 (1.17)	0.84 (1.07)	0.346	1.04 (1.16)	0.94 (1.15)	0.54
I was talked about negatively by others.	1.10 (1.14)	1.27 (1.14)	0.286	1.13 (1.13)	1.47 (1.16)	0.091	1.04 (1.13)	1.39 (1.14)	0.033

Discussion

This study examined the association between IPV typologies and MDD in adolescent mothers who sought postnatal care in an urban, private-not-for-profit health facility in Kampala, Uganda. We identified two key findings. First, six percent of adolescent mothers in the postpartum period had MDD. Second, the odds of MDD were significantly higher among adolescent mothers exposed to emotional or sexual IPV, whereas physical IPV was not associated with higher odds of MDD. Exposure to sexual, physical, and emotional IPV were associated with more severe depressive symptomology respectively. These findings highlight the nuanced mental health consequences of different IPV typologies and underscore the need for integrated IPV and mental health services in postpartum care settings.

The observed six percent prevalence of MDD in this urban adolescent postpartum population is higher than

Table 3 Unadjusted analysis for factors associated with major depressive disorder

Characteristic	Unadj. OR (95%CI)	p-value
Age (years)	0.98 (0.80, 1.20)	0.875
Marital Status		
Currently married	Ref	
Never married	2.35 (0.68, 8.12)	0.176
Ever married	0.56 (0.06, 5.04)	0.609
Emotional IPV		
No	Ref	
Yes	**0.72 (0.22, 2.37)**	0.593
Sexual IPV		
No	Ref	
Yes	**6.86 (2.03, 13.18)**	0.002
Physical IPV		
No	Ref	
Yes	**4.77 (1.24, 8.34)**	0.023
Pregnancy intention		
Intended	Ref	
Unintended	4.95 (0.62, 9.53)	0.131
Substance use		
No	Ref	
Yes	5.27 (1.41, 9.63)	0.013
Complications during childbirth		
No	Ref	
Yes	2.24 (0.68, 7.38)	0.183
Education		
Secondary+	Ref	
Primary	0.66 (0.21, 2.06)	0.470
None	0.31 (0.02, 5.68)	0.429
Employed		
Yes	Ref	
No	0.71 (0.18, 2.77)	0.622
Household wealth quintile		
Poorest	Ref	
Poor	1.71 (0.32, 9.17)	0.533
Medium	1.65 (0.33, 8.17)	0.538
Wealthy	0.27 (0.01, 5.90)	0.408
Wealthiest	2.19 (0.40, 11.84)	0.364
Covert contraceptive use		
No	Ref	
Yes	1.73 (0.31, 9.62)	0.529
Complications during childbirth		
No	Ref	
Yes	2.24 (0.68, 7.38)	0.183

Table 4 Adjusted analysis for independent association between IPV typology and major depressive disorder

Characteristic	Adj. OR (95%CI)	p-value
Age (years)	0.98 (0.80, 1.20)	0.875
Marital Status		
Currently married	Ref	
Never married	0.74 (0.14, 3.83)	0.718
Ever married	0.11 (0.01, 1.53)	0.099
Emotional IPV		
No	Ref	
Yes	**9.82 (5.57, 14.33)**	0.014
Sexual IPV		
No	Ref	
Yes	**8.57 (1.10, 13.88)**	0.040
Physical IPV		
No	Ref	
Yes	6.33 (0.67, 9.86)	0.108
Pregnancy intention		
Intended	Ref	
Unintended	5.30 (0.48, 58.66)	0.174
Substance use		
No	Ref	
Yes	2.83 (0.57, 9.03)	0.203
Complications during childbirth		
No	Ref	
Yes	2.15 (0.58, 8.02)	0.253

prior estimates of 1.3% among urban postpartum women in Uganda, yet comparable to rural-based findings of 6.5% [2, 3, 22]. Several contextual factors may underlie this elevated burden, including widespread economic hardship among participants, the inherent vulnerability of the postpartum period, and COVID-19 related disruptions such as food insecurity, unemployment, and reduced healthcare access, all of which have been linked to poor maternal mental health and increased IPV disclosure [24]. In contrast, a markedly higher prevalence of 35.8% was reported among pregnant women in post-conflict northern Uganda [25]. Differences may reflect the compounded effects of prolonged war, violent instability, and trauma, along with higher inclusion of women living with HIV who are at elevated risk for depression. Additional factors such as pervasive poverty, limited healthcare access, and psychosocial stressors related to HIV and violence likely contributed to this disparity. Furthermore, even within peri-urban settings, women living with HIV demonstrated higher MDD prevalence at 9.6%, underscoring the substantial psychological burden associated with HIV [26].

Importantly, comparability across studies is strengthened by the fact that most prior investigations in Uganda also relied on women recruited from antenatal or postnatal clinics, which, while introducing some selection bias, reflects a consistent sampling frame across studies. The higher MDD burden in the current study might therefore reflect the limitations of our health facility-based recruitment and specific stressors that may have prevailed before and during our study implementation, These potential stressors include, (i) poverty - most (nearly three quarters) of our study sample being poor namely having a low household wealth index, (ii) being in the postpartum period, a time period after childbirth when vulnerability for postpartum depression is high, and (iii) the impact of the post-COVID-19 pandemic, including

worsening maternal and mental health outcomes, a rise in gender-based violence (GBV) cases reported, financial hardships from job losses and unemployment, in addition to an increase in food insecurity.

Second, emotional and sexual IPV were significant predictors of MDD when compared to no IPV exposure, whereas physical IPV showed no such association. This finding aligns with prior research in Uganda highlighting the profound psychological impact of emotional violence on women's mental health [25]. Emotional IPV, often underrecognized, has been shown to have long-term psychological effects, including depressive symptoms [25] and suicidal ideation, even in the absence of physical harm. However, our study revealed a novel and significant association between sexual IPV and MDD among postpartum women. Similarly in prior studies, sexual IPV has consistently been linked to elevated rates of depression among women in the postpartum period in sub-Saharan Africa [10]. To our knowledge, no prior study in Uganda has specifically examined the relationship between sexual IPV and postpartum depression. Although we found no previous Ugandan studies directly assessing this association, one study reported that exposure to any form of IPV was associated with MDD during the postpartum period [26]. The latter study examined IPV as a composite exposure and did not disaggregate by IPV typology. Nonetheless, sexual and emotional IPV often inflict deeper psychological harm due to their intimate and stigmatizing nature, leading to internalized shame, helplessness, and chronic emotional distress.

Notably, we did not find a significant association between physical IPV and MDD. Given the relatively low prevalence of MDD (6%) in our sample and moderate prevalence of physical IPV (37.5%), resulting in small cell sizes, our study was likely underpowered to detect a statistically significant association for this IPV typology. Wide confidence intervals in our adjusted model suggests low precision rather than absence of effect, with our point estimates remaining elevated consistent with prior literature that demonstrated a significant association between physical IPV and depression. [27] While this finding diverges from existing literature, it is important to interpret it cautiously as this likely reflects limited statistical power rather than a true null association. Additionally, underreporting due to stigma or fear of IPV disclosure may have contributed to the lower observed prevalence of physical IPV in our sample [28, 29]. These findings underscore the importance of adequately powered studies when evaluating individual IPV typologies and their mental health impacts.

Despite the recommendations aligned with the WHO MhGap, the implementation of an integrated maternal-mental healthcare service is still under-implemented [30]. There is a paucity of prior research that reveals similar findings related to the association between IPV/lack of partner support and depression, three prior studies were conducted among young women below 18 years of age [26, 27, 31] that revealed a significant association between IPV and depression in the postpartum period [27]. Sexual IPV does not only lead to physical bodily harm but is a well-established predictor of depression symptoms in the Ugandan context among young women engaged in sex work [32], youth and adolescent refugees [33, 34].

Study implications

Regarding the effects of sexual and emotional IPV on MDD, this healthcare seeking population, particularly IPV survivors in the postpartum period, could have IPV detected and addressed by health care providers. Gender-based violence prevention strategies are aligned with Uganda Ministry of Health guidelines that recommend such service integration of mental health and maternal and child health [35]. Despite less than 10% of postpartum adolescents having an MDD diagnosis, this study population with MDD is still at risk of severe complications of depression, like suicidality, highlighting a need to prioritize adolescents attending and adhering to postnatal care follow-up visits. Attending PNC visits as recommended and ensuring reduction in PNC no-shows may be useful to detect symptoms early and improve long-term clinical outcomes of subclinical depression and MDD. Our unpublished findings from a related study revealed a high proportion of probable depression in postpartum adolescents in this study setting. Future research should focus on identifying protective factors among adolescent postpartum mothers exposed to IPV to identify intervention targets. Adopting longitudinal study designs may be able to predict depression symptom resolution or progression. Also, future inquiry into the effectiveness of integrated IPV and mental health interventions in Ugandan settings is warranted.

We now acknowledge that the low prevalence of physical IPV may have limited our statistical power to detect a significant association with MDD. This limitation is particularly relevant in sensitivity analyses restricted to adolescents who were currently or ever married. Given the smaller subsample and the infrequent reporting of physical IPV, these estimates should be interpreted cautiously. Similar challenges in detecting associations with emotional and behavioral disorders due to low prevalence and school-based sampling have been reported among Ugandan adolescents [36].

From a practice and ethical standpoint, future practitioners and researchers should also explore the barriers to accessing mental healthcare in similar populations of postpartum adolescents who may be experiencing IPV or diagnosed with symptoms or clinical depression to

inform practice and policy with innovative preventative interventions. Other implications for practice include developing community-based interventions to address IPV, integrating mental health services into IPV response programs, and strengthening awareness campaigns to increase care seeking behavior for IPV and mental health issues. Policy initiatives should emphasize and prioritize integration of IPV screening and mental healthcare into postnatal services in Uganda. Given the ongoing gap for mental health service delivery in Uganda, policy developing scalable and cost-effective training strategies of healthcare workers to recognize and address the mental health needs of IPV survivors is strongly underscored by these study findings.

Study strengths and limitations

Our study strengths included conducting a comprehensive evaluation of IPV typologies using validated modified conflict tactics scale as well administering diagnostic interviews to confirm clinical depression. This improved the robustness of our study measures for MDD, IPV and subsequent identification of emotional and sexual IPV as a risk factor for MDD in postpartum adolescents seeking PNC clinic services in peri-urban Kampala. Similarly, our study focused on adolescent mothers, a vulnerable population that tends to be underexplored in IPV-related research. Sensitivity analyses restricted to those with recent intimate partnerships yielded point estimates consistent with our main findings, though with wider confidence intervals and attenuated statistical significance due to reduced sample size. This pattern suggests the observed associations are robust, with loss of significance attributable to limited statistical power rather than absence of true effects.

Regarding study limitations, we used a cross-sectional study design which limits our interpretation of causal inferences. Self-reported data on IPV exposure and mental health particularly depression, may be subject to underreporting due to the sensitive contexts of IPV where participants may be reluctant to disclose abuse. Additionally, this data may be affected by recall bias regarding whether and when IPV events or depressive symptoms occurred, such as during pregnancy. Purposive sampling of our study participants introduces the potential for selection bias due to its highly selective nature of selecting adolescent mothers who may have better healthcare seeking behavior such as PNC attendance. This may limit the generalizability of our findings to broader populations of adolescent mothers who do not access postnatal care clinics. The rationale for this sampling approach was to target mothers at a key point of health system contact, where interventions could be delivered. However, this population may not be representative of all adolescent mothers in Kampala. Those attending PNC clinics are more likely to have better health-seeking behaviors, access to care, social support, and/or awareness of health services. Adolescent mothers who do not access postnatal clinics may experience different or higher levels of IPV exposure and may have unmet mental health needs, indicating that our study could potentially underestimate the prevalence and severity of IPV and depression in the broader population of adolescent mothers. Future studies should aim to include community-based samples or compare health-seeking and non-health-seeking adolescent mothers to better assess the full scope of IPV and depression in this population.

The non-significant association between physical IPV and MDD should therefore be interpreted with caution due to the following reasons. First, our sample size, while sufficient to detect associations for the composite IPV measure, limited our statistical power to detect significant associations for individual IPV subtypes, particularly physical IPV. Secondly, potential low disclosure of IPV and the low prevalence of the depressive outcome ($<10\%$) may explain our non-significant association, suggesting a methodological limitation rather than a true null association. Conversely, in line with our study, one previous study demonstrated a strong significant association between physical IPV and depression in a larger population-based sample [37]. Future studies should be specifically powered to examine associations between individual IPV typologies and MDD, particularly for less prevalent outcomes. Furthermore, potential confounders such as experiencing or witnessing child abuse prior mental health history, and stigma may have influenced our findings as they are known to affect IPV and depression risk.

Conclusions

Sexual and emotional forms of IPV were significantly associated with MDD in our study population of adolescent mothers attending PNC in Kampala. These results suggest that IPV significantly contributes to the mental health burden among adolescent mothers in the postpartum period. This underscores a need to strengthen routine provider screening for IPV and depression in PNC and linkage to mental health and violence prevention/response services.

Abbreviations

IPV	Intimate Partner Violence
MDD	Major Depressive Disorder
PNC	Post-Natal Clinic
SSA	Sub-Saharan Africa
CFU	Child and Family Foundation Uganda
PCO	Psychiatric Clinical Officer

Supplementary information

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Supplementary Material 1

Supplementary Material 2

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Author contributions
JL and RA conceptualized this study. JL, CA, HMB, GB, LDC, and RA contributed to the study design. CA, HMB, LDC, and RA supervised study implementation, and data analysis. JL, CA, HMB, GB, EA, BR, WMJ, LDC, and RA contributed to the interpretation of the study findings. JL drafted the initial manuscript. All authors reviewed and approved the final manuscript.

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Data availability
The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethical approval
Ethical approvals for this study were granted by The AIDS Support Organization (TASO), the Medical College of Wisconsin Institutional Review Board, and national clearance from the Uganda National Council for Science and Technology (UNCST). Informed consent was obtained from all study participants who were adolescents with biological children. According to the USCNST, adolescent mothers with biological children are considered emancipated minors and can consent.

Consent to participate
Informed consent was obtained from all study participants. This study guaranteed the confidentiality of participant information through an anonymized database and adhered to the principles of the Declaration of Helsinki.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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