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Postpartum Long-Acting Reversible Contraceptive Use and Its Drivers Among Primipara Adolescent Mothers in Rubirizi District, Southwestern Uganda

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ABSTRACT
Background

Globally, 21 million adolescent pregnancies occur annually, half unintended and contributing to 20% of maternal deaths. While new adolescent pregnancies are concerning, repeat and rapid repeat pregnancies present higher risks of adverse obstetric outcomes, best prevented with Postpartum Long-Acting Reversible Contraceptives (PPLARCs) initiated within six weeks postpartum. In Rubirizi District, primipara adolescents are reported to shun PPLARCs, though without evidence. This study assessed PPLARC use and its drivers among primipara adolescent mothers in Rubirizi District, Southwestern Uganda.

Methods

A cross-sectional study was conducted among 226 adolescent mothers. The district was stratified by sub-counties and Town Councils, from which parishes and villages were randomly selected. Households were systematically sampled, and data collected through structured interviews. Observations and record reviews were used to verify PPLARC uptake. Data were analyzed using descriptive statistics and a log-binomial model in SPSS 26.

Results

PPLARC use prevalence was 31%. Reduced use was associated with reporting implant duration as two years (aPR = 0.121, p = 0.000), not being forced into unprotected sex postpartum (aPR = 0.596, p = 0.010), low perceived risk of obstetric complications (aPR = 0.400, p = 0.044), youngest child <3 months (aPR = 0.373, p = 0.000), and negative provider attitudes (aPR = 0.618, p = 0.008). Increased use was linked to knowledge of IUD duration (aPR = 2.383, p = 0.002), postnatal care attendance (aPR = 18.000, p = 0.000), spousal discussion (aPR = 2.654, p = 0.001), husband support (aPR = 1.802, p = 0.019), counseling (aPR = 3.200, p = 0.023), and health education (aPR = 2.436, p = 0.024).

Conclusion

Only 3 in 10 adolescent mothers used PPLARCs, exposing most to repeat pregnancy risks. Interventions should target spousal involvement, counseling, risk education, and adolescent-friendly services to enhance uptake.

Keywords — **Postpartum long-acting reversible contraception, Adolescent mothers, Drivers.**

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I. INTRODUCTION

Long-acting reversible contraceptives (LARCs) including intrauterine devices (IUDs) and subdermal implants are among the most effective contraceptive methods, with efficacy exceeding 99% and failure rates as low as 0.9 per 100 woman-years (Averbach & Hofler, 2022; Bahamondes et al., 2020; Stark, Gariepy, & Son, 2022). Compared to short-term methods such as pills or condoms, LARCs do not

rely on adherence, making them particularly suitable for the postpartum period when women face high risks of unintended pregnancies (Beckham & Cohen, 2023; Durante et al., 2023). When provided within six weeks after childbirth, they are termed postpartum LARCs (PPLARCs) and offer an effective strategy for preventing rapid repeat pregnancies (RRPs) (Guiahi, 2022; WHO, 2015).

The postpartum period is a critical window for contraception because many women resume menstruation and sexual activity within one to two months after delivery, while less than half exclusively breastfeed and therefore cannot rely on lactation amenorrhea for pregnancy prevention (Gelaw et al., 2024; UNICEF, 2023). Unintended pregnancies shortly after childbirth are strongly associated with short interpregnancy intervals, which increase the risk of adverse maternal and neonatal outcomes, including preterm birth, miscarriage, placenta previa, postpartum hemorrhage, low birth weight, and neonatal mortality (Congdon et al., 2022; Jena et al., 2022; Islam et al., 2022, 2023). These risks are compounded among adolescents, who already face heightened obstetric complications and maternal mortality compared to older women (UNICEF, 2024).

Despite these benefits, PPLARC uptake remains suboptimal. Studies report prevalence as low as 4% in some African settings (Chipako et al., 2024), 12% in the United States (Bruce et al., 2023), and less than 20% in Uganda overall (Nakiwunga et al., 2022), with even lower use among adolescents (<5%) (Towongo & Kelepile, 2024). Uganda continues to struggle with high rates of adolescent pregnancy (25%) (World Bank, 2022; UBOS, 2018), and RRPs affect more than half (58%) of adolescent mothers (Amongin et al., 2020). The burden is similar in Southwestern Uganda, where adolescent pregnancy rates are high in the country and RRPs account for more than 10% of cases (Musinguzi et al., 2022; UNFPA, 2021b).

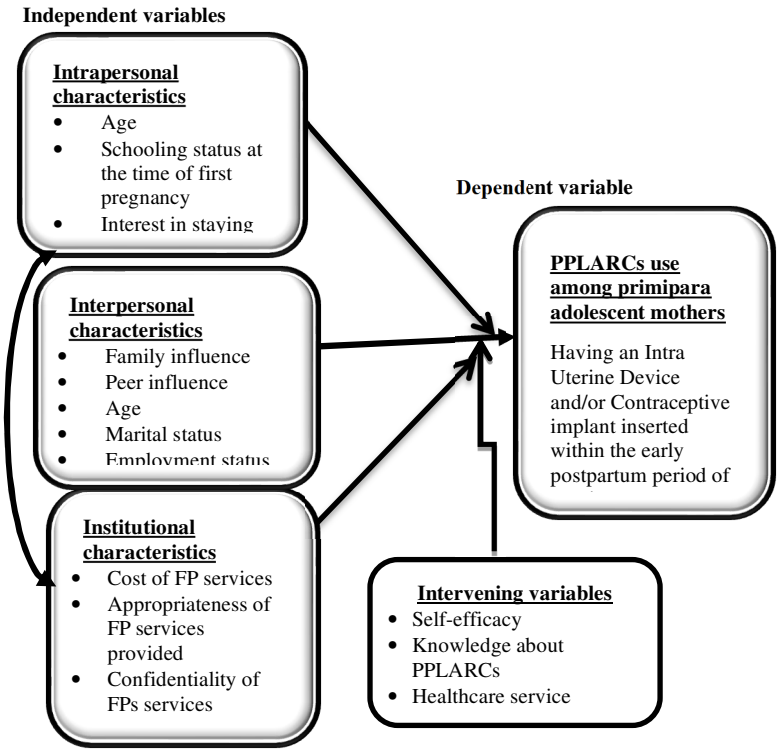
In Rubirizi District, anecdotal reports suggest that adolescent mothers are particularly reluctant to use PPLARCs. Facility data from Rugazi HC IV, the district's largest maternal health provider, indicate that only 21% of adolescent mothers delivering at the facility adopted PPLARCs in 2023, despite the high prevalence of adolescent pregnancy and documented cases of repeat adolescent pregnancies (Rugazi HC IV records, 2023, unpublished). However, no systematic study has established the prevalence or drivers of PPLARC uptake among primipara adolescent mothers in this setting.

This study therefore sought to assess postpartum long-acting reversible contraceptive use and its drivers among primipara adolescent mothers in Rubirizi district, Southwestern Uganda

CONCEPTUAL FRAMEWORK

Figure 1: Conceptual framework, adapted from the Socioecological model (Bronfenbrenner, 1994)

The study was guided by the socio-ecological framework (Bronfenbrenner, 1994), focusing on intrapersonal, interpersonal, and institutional characteristics as independent variables. These were hypothesized to influence postpartum long-acting reversible contraceptive (PPLARC) uptake. Uptake was measured by the use of an IUD or implant within the early postpartum period (Salihu et al., 2015) as the dependent variable.



III. METHODOLOGY

Study Area

The study was conducted in Rubirizi District, Southwestern Uganda, bordered by seven Ugandan districts and the Democratic Republic of Congo. The district has diverse ethnic groups and is administratively composed of nine sub-counties, two town councils, 53 parishes, and 294 villages (Rubirizi District Local Government, 2024).

Study Design

An analytical cross-sectional survey design was used to determine the prevalence and predictors of PPLARC use. This quantitative, observational design allowed for concurrent collection of independent and dependent variables at a single point in time (Setia, 2016; Wang & Cheng, 2020).

Study Population

The target population comprised primipara adolescent mothers (<19 years) in Rubirizi district, who had delivered their most recent pregnancy within the past 6–8 weeks at a health facility in the district.

Eligibility Criteria

The study Included adolescent mothers' resident in Rubirizi who attended ANC and delivered within the district and excluded those with medical contraindications to IUDs/implants, and those aged 20 years at sampling, even if they had delivered at 19.

Sample Size determination

Kish–Leslie (1995) formula was used to estimate adolescent motherhood prevalence of 18% in Rubirizi (Agaba, 2023), the minimum sample size was calculated as 226 primipara adolescent mothers.

Sampling Procedures

The district was stratified by sub-county and town council, from which three parishes each were randomly sampled, yielding 33 parishes. Two villages were then randomly sampled per parish (66 in total), and households systematically sampled with support from Village Health Teams. Eligible adolescent mothers were purposively included.

Data Collection

Data were collected using structured interviews administered with pretested questionnaires covering socio-demographic factors, PPLARC use, and intrapersonal, interpersonal, and institutional characteristics. Verification of PPLARC uptake involved physical examination for implants and review of medical records for IUDs, conducted in private settings. Research assistants and Village Health Teams (VHTs) signed confidentiality agreements before data collection.

Quality Control

Research assistants with health-related training and local language proficiency were trained on study procedures and ethics. The questionnaire was validated by four experts, achieving a content validity index of 0.95. A pretest was conducted among 20 adolescent mothers in Kasese district to assess clarity and feasibility, with adjustments made accordingly

Data Analysis

Data were entered and analyzed using SPSS 26. Descriptive statistics were used to determine the prevalence of PPLARC use. Bivariate analysis was performed using log-binomial regression, and variables with $p<0.20$ were included in multivariable models. Adjusted prevalence ratios with 95% confidence intervals were reported, with statistical significance set at $p<0.05$.

IV. RESULTS

Socio demographics

Table 1: Socio demographic characteristics of the adolescent mothers sampled

Variable	Category	n	%
Current age in complete years	16 years	10	4.4
	17 years	28	12.4
	18 years	76	33.8
	19 years	111	49.3
Current marital status	Married	15	6.6
	Cohabiting	145	64.2
	Single	43	19.0
	Separated	23	10.2
Duration in marriage or cohabitation	Less than Two years	66	41.3
	More than Two years	94	58.8
Currently in school	Yes	3	1.3
	No	223	98.7
Level of school in	Primary (Lower)	1	33.3
	Secondary (O level)	1	33.3
	Post-secondary	1	33.3
Highest level of education attained if not in school	No education	24	10.8
	Primary	153	68.6
	Secondary	46	20.6
Religious denomination	Catholic	85	37.6
	Anglican	77	34.1
	Islam	14	6.2
	Born Again	42	18.6
	Seventh Day Adventist (SDA)	4	1.8
	Bishaka Owobushobozi	4	1.8
Currently employed	Yes	28	12.4
	No	198	87.6

Nearly half of the respondents were aged 19 years (111; 49.3%). Most were cohabiting (145; 64.2%), with more than half having been in such relationships for over two years (94; 58.8%). The vast majority were not attending school at the time of the survey (223; 98.7%); among the few still in school, one-third were in lower primary, secondary (O-level), or post-secondary education (1; 33.3%). Among those out of school, the highest level of education attained by most was primary (53; 68.6%). In terms of religion, more than one-third identified as Catholic (85; 37.6%). The majority of respondents were unemployed (198; 87.6%).

Postpartum long-acting reversible contraceptive use

Table 2: Postpartum long-acting reversible contraceptive use among the adolescent mothers

Variable	Category	n	%
Received postpartum long-acting reversible contraceptives after recent birth			
	Yes	83	36.7
	No	143	63.3
If Yes, After how long	Within 48 hours	6	7.2
	Within a week of birth	10	12.0
	Within two weeks of birth	17	20.5
	Between the third and sixth week	37	44.6
	After 6 weeks of birth	13	15.7
If no contraception received, received it thereafter	Yes	15	10.5
	No	128	89.5
After how long	Between the second and third month	13	86.7
	More than three months	2	13.3
Form of postpartum long-acting reversible contraception did you receive	IUD	5	5.1
	Contraceptive implant	93	94.9
	Yes	55	43.0

If no contraception received, at all, willing to use it once offered	No	73	57.0

Close to two-thirds of primipara adolescent mothers (143; 63.3%) had not received a postpartum long-acting reversible contraceptive after their most recent birth. Among those who had, nearly half (37; 44.6%) initiated between the third and sixth week postpartum. Of the non-users, most (128; 89.5%) had still not taken up a method after six months, though a small proportion initiated between the second and third month (13; 86.7%). Uptake was almost exclusively implants (93; 94.9%). Worryingly, more than half of the adolescents who had not received contraception (73; 57.0%) reported they were not willing to use it even if offered.

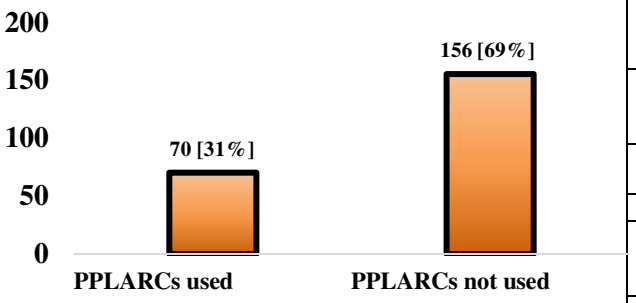


Figure 1:The prevalence of postpartum long-acting reversible contraceptive use among primipara adolescent mothers in Rubirizi district, southwestern Uganda

When the number of adolescent mothers that had received PPLARCs within the early postpartum period was computed, it was found that the prevalence of postpartum long-acting reversible contraceptive use among primipara adolescent mothers in Rubirizi district was 31% (n = 70).

Intrapersonal drivers of postpartum long-acting reversible contraceptive use

Table 3: Bivariate and multivariable analysis of the intrapersonal drivers of postpartum long-acting reversible contraceptive use among primipara adolescent mothers

			PPLARC use status				
Variable	**n**	**%**	**Used [70]**	**Not used [156]**	**cPR (CI)**	**P value**	**aPR (CI)**
Still interested in staying in school							
Yes	2	66.7	1(50.0%)	1(50.0%)			
No	1	33.3	0(0.0%)	1(100.0%)			
At a very high risk of severe obstetric complications, in case I get pregnant again							
Strongly disagree	10	4.4	1(10.0%)	9(90.0%)	0.256 (0.038 1.710)	0.160	0.256 (0.038 - 1.710)
Disagree	34	15.0	5(14.7%)	29(85.3%)	0.377 (0.154-0.923)	**0.033**	0.400 (0.164 - 0.976)
Undecided	18	8.0	3(16.7%)	15(83.3%)	0.427 (0.142 1.285)	0.130	0.427 (.142 - 1.285)
Agree	123	54.4	45(36.6%)	78(63.4%)	0.938 (0.599 1.467)	0.778	0.937 (0.599 - 1.467)
Strongly Agree	41	18.1	16(39.0%)	25(61.0%)	1.000		1.000
Duration of IUD effectiveness							
One year	21	9.3	11(52.4%)	10(47.6%)	2.345 (1.346 4.086)	**0.003**	2.383 (1.358 - 4.182)
Two years	44	19.5	19(43.2%)	25(56.8%)	1.933 (1.164 3.209)	**0.011**	1.965 (1.175 - 3.287)
Three years	67	29.6	19(28.4%)	48(71.6%)	1.269 (0.743 2.169)	0.383	1.290 (0.750 - 2.221)
Up to five years	94	41.6	21(22.3%)	73(77.7%)	1.000		1.000
Duration of implant effectiveness							
One year	25	11.1	2(8.0%)	23(92.0%)	0.180 (0.046 0.708)	**0.014**	0.180 (0.046 -0.707)
Two years	56	24.8	3(5.4%)	53(94.6%)	0.121 (0.038 0.380)	0.000	0.121 (0.038 - 0.382)
Three years	100	44.2	45(45.0%)	55(55.0%)	1.013 (0.684 1.498)	0.950	1.016 (0.682 - 1.513)
Up to five years	45	19.9	20(44.4%)	25(55.6%)	1.000		1.000
Gravidity							
One	191	84.5	61(31.9%)	130(68.1%)	1.242 (0.682 2.263)	0.479	
Two	34	15.0	9(25.7%)	26(74.3%)	1.000		
Parity							
One	221	97.8	70(31.7%)	151(68.3%)			
Two	5	2.2	0(0.0%)	5(100.0%)			
Children wish to have							
One	16	7.1	2(12.5%)	14(87.5%)	0.366 (0.098 1.370)	0.135	0.610 (0.176 - 2.121)
Two	28	12.4	11(39.3%)	17(60.7%)	1.151 (0.683 1.939)	0.598	1.213 (0.758 - 1.943)
Three	59	26.1	15(25.4%)	44(74.6%)	0.745 (0.451 1.229)	0.249	0.830 (0.521 - 1.322)

More than three	123	54.4	42(34.1%)	81(65.9%)	1.000		1.000
Planned recent pregnancy							
Yes	122	54.0	43(35.2%)	79(64.8%)	1.358 (0.906 2.033)	0.143	1.074 (0.742 - 1.556)
No	104	46.0	27(26.0%)	77(74.0%)			1.000
Age of youngest child							
Less than 3 months	128	56.6	33(25.8%)	95(74.2%)	0.368 (0.223 0.608)	**0.000**	0.373 (0.230 - .604)
3 months - 6 months	88	38.9	30(34.1%)	58(65.9%)	0.487 (0.296 0.802)	**0.005**	0.462 (0.287 - 0.744)
More than 6 months	10	4.4	7(70.0%)	3(30.0%)	1.000		1.000
Used modern family planning before							
Yes	71	31.4	17(23.9%)	5(76.1%)	0.700 (0.438 1.119)	0.136	0.661 (0.414 - 1.056)
No	155	68.6	53(34.2%)	102(65.8%)	1.000		1.000
Form of modern family planning used							
Injectable / Tablets/Pills	61	85.9	14(21.9%)	50(78.1%)	0.510 (0.193 1.350)	0.175	0.491 (0.171 - 1.409)
Implant / IUD	6	8.5	3(42.9%)	4(57.1%)	1.000		1.000
Mode of delivery of most recent pregnancy							
Normal delivery	185	81.9	55(29.7%)	130(70.3%)	0.813 (0.513 1.287)	0.377	
Caesarean section	41	18.1	15(36.6%)	26(63.4%)	1.000		

Most adolescent mothers were primipara (97.8%) and primigravid (84.5%), over half had youngest children under three months (56.6%), and a majority had never used modern family planning (68.6%), with injectables/pills being the most common prior method.

At the bivariable level, PPLARC use was lower among mothers who disagreed they were at high risk of severe obstetric complications (aPR = 0.400, 95% CI: 0.164–0.976, p = 0.044) and among those whose youngest child was under three months (aPR = 0.373, 95% CI: 0.230–0.604, p < 0.001). Reporting implant effectiveness as two years was associated with lower PPLARC uptake (aPR = 0.121, 95% CI: 0.038–0.382, p < 0.001), whereas reporting IUD effectiveness as one year increased uptake (aPR = 2.383, 95% CI: 1.358–4.182, p = 0.002).

Table 4: Continuation of bivariate and multivariable analysis of the intrapersonal drivers of PPLARCs use among primipara adolescent mothers

			PPLARC use status				
Variable	**n**	**%**	**Used [70]**	**Not used [156]**	**cPR (CI)**	**P value**	**aPR (CI)**
Place of delivery of recent pregnancy							
Public hospital or health center IV	125	55.3	42(33.6%)	83(66.4%)	2.016 (0.797 - 5.099)	0.139	0.823 (0.228 - 2.974)	0.766
Public HC III, II	77	34.1	24(31.2%)	53(68.8%)	1.870 (0.720 - 4.856)	0.198	0.464 (0.104 - 2.082)	0.316
At home	24	10.6	4(16.7%)	20(83.3%)	1.000		1.000	
If facility, returned to a facility to seek PNC							
Yes	99	48.5	59(60.2%)	39(39.8%)	8.945 (4.296 - 18.622)	**0.000**	18.000 (2.516 - 12.779)	**0.000**
No	105	51.5	7(6.7%)	97(93.3%)	1.000		1.000	
If not facility delivery, received PNC							
Yes	10	41.7	4(40.0%)	6(60.0%)				
No	14	58.3	0(0.0%)	14(100.0%)				
Current age							
16 years	10	4.4	0(0.0%)	10(100.0%)				
17 years	28	12.4	7(25.0%)	21(75.0%)				
18 years	76	33.8	26(34.2%)	50(65.8%)				
19 years	111	49.3	37(33.3%)	74(66.7%)				
Current marital status							
Married	15	6.6	6(40.0%)	9(60.0%)	1.840 (0.682 - 4.965)	0.229		
cohabiting	145	64.2	51(35.2%)	94(64.8%)	1.618 (0.722 - 3.623)	0.242		
Single	43	19.0	8(18.6%)	35(81.4%)	0.856 (0.316 - 2.317)	0.759		
Separated	23	10.2	5(21.7%)	18(78.3%)	1.000			
Duration in marriage or cohabitation							
Less than Two years	66	41.3	21(31.8%)	45(68.2%)	0.831 (0.537 - 1.286)	0.405		
More than Two years	94	58.8	36(38.3%)	58(61.7%)	1.000			
Currently in school							
Yes	3	1.3	1(33.3%)	2(66.7%)	1.077 (0.215 - 5.402)	0.928		
No	223	98.7	69(30.9%)	154(69.1%)	1.000			
Level of school in							
Primary (Lower)	1	33.3	0(0.0%)	1(100.0%)				
Secondary (O level)	1	33.3	0(0.0%)	1(100.0%)				

Post-secondary	1	33.3	1(100.0%)	0(0.0%)		
Highest level of education attained if not in school						
No education	24	10.8	3(12.5%)	21(87.5%)	0.383 (0.123 - 1.195)	0.098
Primary	153	68.6	51(33.3%)	102(66.7%)	1.022 (0.638 - 1.639)	0.927
Secondary	46	20.6	15(32.6%)	31(67.4%)	1.000	
Religious denomination						
Catholic	85	37.6	33(38.8%)	52(61.2%)		
Anglican	77	34.1	20(26.0%)	57(74.0%)		
Islam	14	6.2	6(42.9%)	8(57.1%)		
Born Again	42	18.6	10(23.8%)	32(76.2%)		
Seventh Day Adventist (SDA)	4	1.8	1(25.0%)	3(75.0%)		
Bishaka Owobushoboz i	4	1.8	0(0.0%)	4(100.0%)		
Currently employed						
Yes	28	12.4	14(50.0%)	14(50.0%)	1.768 (1.148 - 2.722)	**0.010**
No	198	87.6	56(28.3%)	142(71.7%)	1.000	

A continuation of descriptive intrapersonal findings indicates that most of the mothers had delivered their recent pregnancies at Public hospital or health center IV 125(55.3%). Slightly more than half of the mothers who delivered at a health facility had not returned to a health facility to seek PNC 104(51.5%), similar to the majority of those who had not delivered in a health facility 14(58.3%). The continuation of analysis of intrapersonal factors associated with PPLARCs use revealed one more characteristic that was significant, and that was the attendance of postnatal care among those who had skilled birth attendance. The prevalence of PPLARC use was 18 times higher among adolescent mothers who had delivered in a health facility and returned to a facility to seek PNC ([aPR = 18.000, 95% CI = 2.516 - 12.779, p = 0.000]) compared to those who had not sought PNC.

Interpersonal drivers of postpartum long-acting reversible contraceptive use

Table 5: Bivariable and multivariable analysis of the Interpersonal drivers of postpartum long-acting reversible contraceptive use among primipara adolescent mothers in Rubirizi district, south western Uganda

			PPLARC use status				
Variable	**n**	**%**	**Used [70]**	**Not used [156]**	**cPR (CI)**	**P value**	**aPR (CI)**	**P value**
Age of husband/spouse								
Less than 18 years	5	2.2	0(0.0%)	5(100.0%)				
Between 18 - 23 years	87	38.5	26(29.9%)	61(70.1%)				
Between 24 - 29 years	114	50.4	37(32.5%)	77(67.5%)				
More than 29 years	20	8.8	7(35.0%)	13(65.0%)				
Type of family hailed from								
Polygamous	71	31.4	27(38.0%)	44(62.0%)	1.371 (0.927 - 2.026)	0.114	1.432 (0.975 - 2.102)	0.06
Monogamous	155	68.6	43(27.7%)	112(72.3%)	1.000		1.000	
Ever discussed with husband on number of children to have								
Yes	121	53.5	48(39.7%)	73(60.3%)	1.893 (1.230 - 2.915)	**0.004**	1.229 (0.780 - 1.936)	0.37
No	105	46.5	22(21.0%)	83(79.0%)	1.000			
Ever discussed with husband about family planning after childbirth								
Yes	135	59.7	57(42.2%)	78(57.8%)	2.956 (1.721 - 5.075)	**0.000**	2.654 (1.468 - 4.799)	**0.00**
No	91	40.3	13(14.3%)	78(85.7%)	1.000		1.000	
Religion allows use modern methods of family planning to regulate fertility								
Yes	130	57.5	34(26.2%)	96(73.8%)	0.697 (0.473 - 1.027)	0.068	0.719 (0.490 - 1.055)	0.09
No	96	42.5	36(37.5%)	60(62.5%)	1.000		1.000	
Have traditional belief/cultural norms that inhibit use of postpartum family planning								
Yes	14	6.2	2(14.3%)	12(85.7%)	0.445 (0.122 - 1.631)	0.222	0.502 (0.139 - 1.808)	0.29
No	212	93.8	68(32.1%)	144(67.9%)	1.000		1.000	
Husband support family planning services use								

Yes	122	54.0	52(42.6%)	70(57.4%)	2.463 (1.543 - 3.932)	**0.000**	1.802 (1.102 - 2.945)	**0.01**
No	104	46.0	18(17.3%)	86(82.7%)	1.000		1.000	
Person who influences family planning decisions in household								
Husband	48	21.2	9(18.8%)	39(81.3%)	0.406 (0.215 - 0.767)	**0.005**	0.581 (0.312 - 1.083)	0.08
Parents, other relatives	15	6.6	2(13.3%)	13(86.7%)	0.289 (0.078 - 1.073)	0.064	0.882 (0.213 - 3.644)	0.86
Self	85	37.6	23(27.1%)	62(72.9%)	0.586 (0.384 - 0.895)	**0.013**	1.099 (0.726 - 1.665)	0.65
Husband and self	78	34.5	36(46.2%)	42(53.8%)	1.000		1.000	
Religious denomination-spouse								
Catholic	77	34.1	24(31.2%)	53(68.8%)				
Anglican	90	39.8	27(30.0%)	63(70.0%)				
Born again	31	13.7	11(35.5%)	20(64.5%)				
Islam	20	8.8	7(35.0%)	13(65.0%				
Seventh Day Adventist (SDA)	4	1.8	1(25.0%)	3(75.0%)				
Bishaka Owobushobozi	4	1.8	0(0.0%)	4(100.0%)				
Spouse uses condoms consistently								
Always	6	2.7	0(0.0%)	6(100.0%)				
Sometimes	24	10.6	7(29.2%)	17(70.8%)				
Rarely	10	4.4	2(20.0%)	8(80.0%)				
Never	186	82.3	61(32.8%)	125(67.2%)				
Husband involved in ANC								
Yes	73	32.3	28(38.4%)	45(61.6%)	1.397 (0.947 - 2.061)	0.091	0.947 (0.670 - 1.337)	0.75
No	153	67.7	42(27.5%)	111(72.5%)	1.000		1.000	
I have friends, the same age as me, who have given birth to two or more children and they are fine								
Strongly agree	19	8.4	7(36.8%)	12(63.2%)	1.000 (0.435 - 2.299)	1.000	0.800 (0.378 - 1.692)	0.55
Agree	96	42.5	36(37.5%)	60(62.5%)	1.018 (0.535 - 1.936)	0.957	0.852 (0.446 - 1.628)	0.62
Undecided	10	4.4	2(20.0%)	8(80.0%)	0.543 (0.138 - 2.141)	0.383	0.565 (0.147 - 2.178)	0.40
Disagree	82	36.3	18(22.0%)	64(78.0%)	0.596 (0.291 - 1.220)	0.157	0.512 (0.252 - 1.037)	0.06
Strongly disagree	19	8.4	7(36.8%)	12(63.2%)	1.000		1.000	
My parents influenced me to have another/other child/children early enough								
Agree	15	6.6	2(13.3%)	1(86.7%)				
Undecided	8	3.5	0(0.0%)	8(100.0%)				
Disagree	102	45.1	28(27.5%)	74(72.5%)				
Strongly disagree	101	44.7	40(39.6%)	61(60.4%)				
Spouse forced unprotected sex on woman after birth								
Strongly agree	14	6.2	2(14.3%)	12(85.7%)	0.328 (.088 - 1.221)	0.096	0.371 (0.101 - 1.361)	0.13
Agree	33	14.6	14(42.4%)	19(57.6%)	0.974 (.598 - 1.587)	0.916	0.953 (0.629 - 1.446)	0.82
Undecided	8	3.5	1(12.5%)	7(87.5%)	0.287 (.045 - 1.835)	0.187	0.317 (0.052- 1.932)	0.21
Disagree	109	48.2	26(23.9%)	83(76.1%)	0.548 (0.353 - 0.850)	**0.007**	0.596 (0.401 - 0.886)	**0.01**
Strongly disagree	62	27.4	27(43.5%)	35(56.5%)	1.000		1.000	

Half of the primipara adolescent mothers' spouses were aged 24–29 years (114; 50.4%), and most came from monogamous families (155; 68.6%). Over half had discussed with their husbands the number of children to have (121; 53.5%) and postpartum family planning (135; 59.7%), while most reported husband support for family planning services (122; 54.0%). Majority indicated their religion permitted

modern contraception (130; 57.5%) and did not hold cultural norms inhibiting postpartum family planning (212; 93.8%).

At confounding adjustment, PPLARC uptake was twice as high among mothers who discussed family planning with their husbands after childbirth (aPR = 2.654, 95% CI: 1.468–4.799, p = 0.001) and 80% higher among those whose husbands supported family planning services (aPR = 1.802, 95% CI: 1.102–2.945, p = 0.019). Conversely, PPLARC use was 40% lower among mothers who disagreed that their spouses had forced them into unprotected sex postpartum (aPR = 0.596, 95% CI: 0.401–0.886, p = 0.010).

Institutional drivers of postpartum long-acting reversible contraceptive use

Table 6: Bivariable and multivariable analysis of the institutional drivers of postpartum long-acting reversible contraceptive use among primipara, adolescent mothers in Rubirizi district, southwestern Uganda

			PPLARCs use					
Variable	**n**	**%**	**Used [70]**	**Not used [156]**	**cPR (CI)**	**P value**	**aPR (CI)**	**P value**
Received family planning counseling ANC								
Yes	193	85.4	64(33.2%)	129(66.8%)	1.824 (0.861 - 3.865)	0.117	1.230 (0.597 - 2.537)	0.574
No	33	14.6	6(18.2%)	27(81.8%)	1.000		1.000	
Received family planning counseling after childbirth								
Yes	162	71.7	63(38.9%)	99(61.1%)	3.556 (1.722 - 7.343)	**0.001**	3.200 (1.175 - 8.715)	**0.023**
No	64	28.3	7(10.9%)	57(89.1%)	1.000		1.000	
Told about the possibility of receiving an IUD or implants after childbirth, by skilled birth attendants								
Yes	143	63.3	60(42.0%)	83(58.0%)	3.483 (1.888 - 6.425)	**0.000**	1.919 (0.809 - 4.551)	0.139
No	83	36.7	10(12.0%)	73(88.0%)	1.000		1.000	
Ever provided with health education related to PPLARC at any point								
Yes	151	66.8	62(41.1%)	89(58.9%)	3.849 (1.946 - 7.615)	**0.000**	2.436 (1.125 - 5.276)	**0.024**
No	75	33.2	8(10.7%)	67(89.3%)	1.000		1.000	
Discussed with a clinician about family planning during pregnancy								
Yes	120	53.1	53(44.2%)	67(55.8%)	2.754 (1.704 - 4.450)	**0.000**	1.602 (0.352 - 1.030	0.064
No	106	46.9	17(16.0%)	89(84.0%)	1.000		1.000	
Categorically educated about the need for postpartum contraception								
Yes	131	58.0	59(45.0%)	72(55.0%)	3.890 (2.163 - 6.996)	**0.000**	3.823 (1.825 - 8.010)	**0.000**
No	95	42.0	11(11.6%)	84(88.4%)	1.000		1.000	
Attitude of the skilled birth attendants								
Positive (Responsive, approachable)	187	82.7	53(28.3%)	134(71.7%)	0.650 (0.426 - 0.993)	**0.046**	0.618 (0.433-0.881)	**0.008**
Negative (Rude, inapproachable, unfriendly)	39	17.3	17(43.6%)	22(56.4%)	1.000		1.000	
Went to health facility, and were told that there were no IUDs or contraceptive implants in stock								
Yes	14	6.2	4(28.6%)	10(71.4%)	0.918 (0.391 - 2.152)	0.843		
No	212	93.8	66(31.1%)	146(68.9%)	1.000			

Most primipara adolescent mothers received family planning counseling during ANC (193; 85.4%) and after childbirth (162; 71.7%) and were informed about IUDs or implants by skilled birth attendants (143; 63.3%). About two-thirds received health education on PPLARCs at some point (151; 66.8%), while over half discussed family planning with clinicians during pregnancy (120; 53.1%) and received categorical education on postpartum contraception (131; 58.0%). Most rated the attitude of healthcare workers as positive (187; 82.7%) and reported consistent availability of IUDs and implants (212; 93.8%).

After adjustment for confounders, primipara adolescent mothers who received family planning counseling after childbirth had three times higher prevalence of PPLARC use (aPR = 3.200, 95% CI: 1.175–8.715, p = 0.023). Mothers who received PPLARC-related health education during pregnancy had twice the prevalence of use (aPR = 2.436, 95% CI: 1.125–5.276, p = 0.024), and those who were categorically educated on postpartum contraception exhibited three times higher prevalence (aPR = 3.823, 95% CI: 1.825–8.010, p < 0.001). Interestingly, PPLARC use was 38% lower among mothers who rated healthcare worker attitudes as positive compared to those who rated them negatively (aPR = 0.618, 95% CI: 0.433–0.881, p = 0.008).

V. DISCUSSION

The prevalence of postpartum long-acting reversible contraceptive use among primipara adolescent mothers in Rubirizi district, southwestern Uganda

Adolescent pregnancy is widely recognized as a persistent global and regional challenge (Maharaj, 2022), with repeat pregnancies being particularly concerning (Ramage et al., 2021; Paula dos Santos et al., 2017). While previous studies have addressed adolescent fertility broadly, relatively few have examined postpartum contraceptive uptake among adolescent mothers in community-based contexts. Most earlier research has been facility-based, inherently favoring adolescents with better health-seeking behaviors (Arero et al., 2022; Shiferaw & Musa, 2017). The current study therefore contributes by estimating postpartum long-acting reversible contraceptive (LARC) use among primipara adolescent mothers in Rubirizi district, southwestern Uganda.

The study revealed that 31% of adolescent mothers were using a postpartum LARC, while nearly seven in ten were not. This finding suggests that postpartum uptake remains inadequate to guarantee broad prevention of repeat adolescent pregnancies. Nevertheless, the prevalence is relatively higher than several studies conducted in Ethiopia (Shiferaw & Musa, 2017) and Uganda, which documented uptake ranging from 3.4% to 28% (Nakiwunga et al., 2022).

By contrast, facility-based studies in Ethiopia reported prevalence above 33% (Arero et al., 2022), a difference that likely reflects increased access to contraceptive counseling and services in health facilities. Similarly, Mehare et al. (2020) reported a pooled prevalence of 48.1% in Ethiopia, again largely from facility samples. These comparisons highlight the influence of study setting on observed uptake patterns.

Although the study did not assess contraceptive continuation and method satisfaction factors that are important for understanding sustained protection, its community-based design offered a significant advantage. By recruiting adolescent mothers outside health facilities, the study provided a more representative estimate of postpartum LARC use than facility-only research, which often reflects women with better health-seeking behaviors (Kabalo et al., 2016).

The findings imply that, although relatively higher than some sub-Saharan African settings, postpartum LARC uptake in Rubirizi remains inadequate. Future research should evaluate barriers to sustained use and explore community-based adolescent-friendly interventions (Bameka et al., 2023; Chandi et al., 2024). The prevalence of postpartum LARC use in Rubirizi district, though commendable compared to several settings, is insufficient, leaving most adolescent mothers vulnerable to rapid repeat pregnancies and their associated adverse outcomes (Paula dos Santos et al., 2017; Ramage et al., 2021).

The intrapersonal drivers of postpartum long-acting reversible contraceptive use among primipara adolescent mothers in Rubirizi district, southwestern Uganda

Understanding and quantifying the individual factors that shape contraceptive uptake decisions is crucial for preventing repeat adolescent pregnancies, yet intrapersonal drivers among primipara adolescent mothers remain underexplored (Wang et al., 2024; Li et al., 2020; Kashyap et al., 2020). Most existing research has concentrated on structural or health system barriers, giving limited attention to how personal perceptions, prior reproductive experiences, and knowledge influence postpartum long-acting reversible contraceptive (PPLARC) uptake (Vogel et al., 2021; Jadil & Ouzir, 2021).

This study results revealed that perceived risk of severe obstetric complications strongly influenced PPLARC use, with adolescents who underestimated their risk being 60% less likely to adopt contraception (Dev et al., 2019; Abera et al., 2015). Surprisingly, mothers who incorrectly believed intrauterine devices were effective for only one year had higher uptake, suggesting that heightened risk perception can compensate for knowledge gaps (Prue et al., 2019; DeDonno et al., 2022).

Similarly, mothers who had planned their most recent pregnancies demonstrated higher LARC use, consistent with evidence that reproductive planning and prior contraceptive experience predispose women to adopt long-acting methods postpartum (Tessema et al., 2021; Silesh et al., 2022). Attendance at postnatal care visits increased LARC uptake eighteen-fold, reinforcing prior findings that facility contact facilitates counseling, dispels myths, and promotes timely uptake. (Alrawi et al., 2021; Mutea et al., 2022).

Conversely, adolescent mothers with infants under three months were 63% less likely to use PPLARCs, reflecting reliance on lactational amenorrhea and perceived low pregnancy risk (Tilahun et al., 2022). Perceived risk, pregnancy planning, and postnatal care attendance are critical determinants of postpartum LARC use among primipara adolescent mothers**.**

The interpersonal drivers of postpartum long-acting reversible contraceptive use among primipara adolescent mothers

Male partner involvement emerged as a pivotal determinant of postpartum long-acting reversible contraceptive (PPLARC) use among primipara adolescent mothers in Rubirizi district, reflecting the strong influence of interpersonal relationships on reproductive health decisions (Widyastuti et al., 2023; Nurjanah et al., 2025; Kassa et al., 2021; Silesh et al., 2022).

Adolescent mothers who discussed family planning with their husbands after childbirth had twice the likelihood of using PPLARCs compared to those who had not engaged in such discussions, corroborating evidence that couple communication enhances contraceptive uptake (Grabert et al., 2021; Abraha et al., 2017). In many African societies, reproductive decisions are heavily influenced by husbands; therefore, spousal engagement can increase maternal autonomy, encourage postnatal care attendance, and promote timely adoption of long-acting contraceptives (Utami et al., 2022; Sumartini & Indriani, 2016; Bryant et al., 2015).

Consistently, adolescent mothers reporting spousal support for family planning had an 80% higher prevalence of PPLARC use**.** Unexpectedly, mothers who were not coerced into sex postpartum had 40% lower odds of using PPLARCs, a finding explained by the lack of active spousal involvement or support in family planning decisions, which may offset the benefits of autonomy. The findings highlight the critical role of male partner communication, support, and engagement in postpartum contraceptive uptake. Future programs should integrate strategies that actively involve husbands in family planning counseling to enhance uptake of PPLARCs among adolescent mothers.

The institutional drivers of postpartum long-acting reversible contraceptive use among primipara adolescent mothers

Institutional factors play a crucial role in shaping postpartum long-acting reversible contraceptive (PPLARC) use among primipara adolescent mothers, yet their specific influence remains underexplored in rural Ugandan settings (Swan et al., 2020; Kabia et al., 2019; Dev et al., 2019).

The study findings indicate that adolescent mothers who received family planning counseling after childbirth exhibited three times the prevalence of PPLARC use compared to those who did not, highlighting the critical role of provider-mother interactions in facilitating contraceptive adoption. Similarly, health education on postpartum contraception during pregnancy significantly increased uptake, emphasizing that knowledge of PPLARCs their benefits, functioning, side effects, and management heightens perceptions of contraceptive advantages and perceived severity of obstetric risks, which in turn promotes uptake (Wang et al., 2024; Li et al., 2020; Kashyap et al., 2020; Vogel et al., 2021; Jadil & Ouzir, 2021; Prue et al., 2019; DeDonno et al., 2022). Categorical education from healthcare workers about the need for postpartum contraception similarly tripled PPLARC use, underscoring that targeted counseling is more effective than general information.

Unexpectedly, adolescent mothers who rated healthcare worker attitudes as positive had 38% lower odds of using PPLARCs. Further analysis revealed that these mothers often did not attend postnatal care, limiting their exposure to counseling and contraceptive services; thus, positive attitude perceptions alone were insufficient to drive uptake (Ninsiima et al., 2021; Mulaudzi et al., 2018). Study findings highlight that institutional interventions particularly structured counseling, education, and PNC attendance are pivotal determinants of postpartum contraceptive use. Future programs should strengthen facility-based education and counseling to maximize adolescent PPLARC uptake.

VI. CONCLUSION

Postpartum long-acting reversible contraceptive (PPLARC) use among adolescent mothers in Rubirizi district is low, at 31%, with uptake shaped by intrapersonal, interpersonal, and institutional factors.

At the intrapersonal level, use was higher among mothers who attended postnatal care but lower among those with limited awareness of IUD and implant

effectiveness, low perceived risk of severe obstetric complications, or youngest children under three months. Interpersonal influences included positive effects of spousal discussions on family planning and husband support, while absence of sexual coercion was unexpectedly linked to lower uptake due to limited spousal involvement. Institutional drivers that promoted PPLARC use included postpartum family planning counseling, health education during pregnancy, and categorical guidance on contraception, whereas positive perceptions of healthcare worker attitude alone were insufficient without postnatal care attendance.

These findings highlight the need for integrated, adolescent-focused strategies that strengthen postnatal care engagement, promote spousal involvement, and enhance targeted contraceptive education, with future mixed-methods studies recommended to explore non-users' perspectives.

VII. ETHICAL CONSIDERATIONS

Ethical approval was obtained from Bishop Stuart University Research Ethics Committee (REC-BSU-2024-468), and permission to conduct research in community was secured from Rubirizi District authorities. Written informed consent was obtained from participants aged ≥18 years, while guardians consented for minors who also assented. Confidentiality and anonymity were ensured, with no personal identifiers collected. Participation was voluntary, and infection prevention protocols were strictly observed.

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