DOI: https://doi.org/10.54393/pjhs.v6i11.3490

PAKISTAN JOURNAL OF HEALTH SCIENCES
(LAHORE)
https://thejas.com.pk/index.php/pjhs
ISSN (E): 2790-9352, (P): 2790-9344
Volume 6, Issue 11 (November 2025)

Original Article

OPEN ACCESS

Postpartum Contraception: A Neglected Field to Avoid Unplanned Pregnancy and Short Inter-Pregnancy Intervals

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ARTICLE INFO

Keywords:
Postpartum Contraception, Inter-Pregnancy Interval, Family Planning, Maternal Health

How to Cite:
Shoaib, M., Gul, F., Mehsud, R., Maqsood, L., Firdous, S., & Tariq, M. (2025). Postpartum Contraception: A Neglected Field to Avoid Unplanned Pregnancy and Short Inter-Pregnancy Intervals: Postpartum Contraception: Unplanned Pregnancy and Short Inter-Pregnancy Intervals. Pakistan Journal of Health Sciences, 6(11), 72-78. https://doi.org/10.54393/pjhs.v6i11.3490

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Received Date: 14th September, 2025
Revised Date: 11th November, 2025
Acceptance Date: 18th November, 2025
Published Date: 30th November, 2025

ABSTRACT

Postpartum contraception plays a crucial role in preventing unintended pregnancies and optimizing birth spacing. However, its utilization remains suboptimal in many low- and middle-income settings. **Objectives:** To determine the prevalence, method mix, and factors associated with postpartum contraceptive use among women attending KMU-IMS, Kohat. **Methods:** A cross-sectional study was conducted among 103 postpartum women attending the Department of Obstetrics and Gynecology, Khyber Medical University Institute of Medical Sciences and Liaqat Memorial Hospital, Kohat. Data were collected using a structured questionnaire and analyzed using SPSS version 25.0. Descriptive statistics summarized demographic and clinical characteristics, while Chi-square and Fisher's exact tests examined bivariate associations. Variables with $p<0.2$ were included in multivariable logistic regression to identify independent predictors. **Results:** The prevalence of postpartum contraceptive use was 47.6%. The most commonly used methods were the lactational amenorrhea method (28.6%), condoms (22.4%), and oral contraceptive pills (14.3%). Most women (38.8%) initiated contraception within six weeks postpartum. No significant associations were found between contraceptive use and socio-demographic or obstetric variables. Women with vaginal deliveries reported higher use (57.9%) than those with caesarean (35.0%) or assisted deliveries (33.3%) (Fisher's p=0.071). After adjusting for confounders, none of the factors remained statistically significant; caesarean delivery showed higher but non-significant odds (aOR = 2.69, 95% CI 1.03–7.00, p=0.043). **Conclusion:** Postpartum contraceptive use among women attending KMU-IMS, Kohat, was moderate, with a preference for temporary methods. Utilization appeared independent of most socio-demographic and obstetric factors, underscoring the need to strengthen postnatal counseling and address individual and cultural barriers to improve uptake.

INTRODUCTION

Postpartum contraception plays a pivotal role in improving maternal and child health by preventing unintended pregnancies and reducing short inter-pregnancy intervals, which are associated with increased risks of preterm birth, low birth weight, and maternal complications [1]. Globally, the unmet need for contraception in the first year postpartum remains high. An analysis by Cooper estimated that 61% of women in low- and middle-income countries had an unmet need for family planning within 12 months after childbirth [2]. Several studies from sub-Saharan Africa and South Asia have documented suboptimal use of postpartum family planning [3]. In Ethiopia, Ismael et al. reported a utilization rate of 55.7% [4], while Ngumbau et al. found 61.2% in Kenya, with integration of family planning into maternal care cited as a key success factor [5]. In contrast, in China, Coulson et al. noted that only 38% of postpartum women used contraception, often due to misconceptions, cultural beliefs, and poor access to services [6]. In Pakistan, the situation mirrors these global challenges but is further compounded by socio-cultural

DOI: https://doi.org/10.54393/pjhs.v6i11.3490

barriers, gender dynamics, and service delivery gaps [7]. The Pakistan Demographic and Health Survey (PDHS) 2017 reported that only 26% of married women were using any modern method of contraception, with postpartum women having a particularly high unmet need [8]. Local studies have highlighted that while awareness may be relatively high, actual uptake is limited. Safdar et al. in Pakistan reported a postpartum contraceptive use rate of 45% [9], while Khan et al. in a rural area documented just 32% [10]. Factors such as lack of counseling, partner opposition, fear of side effects, and limited service availability have been consistently reported. The postpartum period offers a unique window of opportunity for initiating family planning, as women are already in contact with health services for delivery and newborn care. However, this opportunity is often missed in Pakistan due to fragmented counseling services and inadequate integration of family planning into postnatal care. By identifying gaps and associated factors, the findings aim to guide evidence-based interventions for improving maternal health outcomes in the region.

There is a lack of region-specific evidence from Khyber Pakhtunkhwa, particularly peri-urban and rural settings, on the prevalence, method mix, and determinants of postpartum contraceptive use. This study aimed to determine the prevalence, method mix, and determinants of postpartum contraceptive use among women attending a tertiary care hospital in Kohat by giving the scarcity of region-specific data from Khyber Pakhtunkhwa, especially in peri-urban and rural settings.

METHODS

This study was conducted as a cross-sectional analytical design, aimed at evaluating factors influencing postpartum contraceptive use, reasons for non-use, and their association with socio-demographic and obstetric characteristics. The study was approved by the KMU Research Ethics Committee (Ref No: KIMS-REC/ECC/23/15). Written informed consent was obtained from all participants. Confidentiality and anonymity were maintained by coding data and storing it in password-protected files. The study was carried out at the Department of Gynecology and Obstetrics, Khyber Medical University Institute of Medical Sciences (KMU-IMS), and Liaqat Memorial Hospital, Kohat, Pakistan, a tertiary care facility that provides both routine and specialized maternal and reproductive health services. Data were collected for six months, from January 2024 to June 2024. The required sample size was calculated using the World Health Organization formula for estimating a single population proportion $n = Z^2 \times p (1 - p) / d^2$, where Z = 1.96 (for 95% confidence level), p = 0.47 (assumed prevalence of postpartum contraceptive use from previous studies) [11], and d = 0.08 (margin of error). This yielded a sample size of 103 participants. The calculation was also verified using the WHO sample size calculator (version 2.0, Geneva). A consecutive non-probability sampling technique was adopted. All eligible women attending the postnatal clinic during the study period were approached for participation until the target sample size was achieved. Inclusion criteria were women aged 18–45 years who had delivered within the last 12 months, attended postnatal care or immunization clinics at KMU-IMS. Exclusion criteria included women with medically contraindicated contraceptive use (e.g., severe cardiac disease, uncontrolled hypertension), those with serious postpartum complications requiring hospitalization, and those who declined participation. A structured, pre-tested questionnaire was used for data collection. The tool was developed in English, translated into Urdu for participant convenience, and back-translated to ensure accuracy. The questionnaire was divided into sections covering Demographic details: age, residence, education, occupation, and socio-economic status. Obstetric and clinical history: gravida, parity, mode of last delivery, gestational age, inter-pregnancy interval (IPI), and breastfeeding status. Awareness and counseling: antenatal and postnatal counseling on contraception, and access to family planning services. Current contraceptive use: type of method and timing of initiation. Reasons for non-use: fear of side effects, partner opposition, religious or personal beliefs, cost barriers, and other relevant factors. Data were collected through face-to-face interviews conducted by trained female data collectors to ensure privacy and comfort for participants. Content validity was ensured through consultation with three experts in gynecology and public health. The questionnaire underwent pilot testing on 10 postpartum women (excluded from final analysis) to identify ambiguities and improve clarity. Internal consistency for multi-item sections was assessed using Cronbach's alpha, with a reliability score of 0.82, indicating high reliability. Data were analyzed using IBM SPSS Statistics version 26.0. Descriptive statistics were applied to summarize study variables. Categorical variables, including sociodemographic factors, obstetric history, awareness, counseling status, access to services, contraceptive use, method mix, and reasons for non-use, were presented as frequency (%). Bivariate analysis was performed using the Chi-square test (or Fisher's exact test where expected cell counts were less than five) to examine associations between current contraceptive use and selected variables Bivariate analysis was performed using the Chi-square test (or Fisher's exact test where expected cell counts were less than five) to examine associations between current contraceptive use and selected variables. Variables with p-value<0.20 in the bivariate analysis were considered for

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inclusion in multivariable analysis, as recommended by Hosmer and Lemeshow to avoid exclusion of potentially important predictors [12]. Binary logistic regression (enter method) was used to compute adjusted odds ratios (aOR) with 95% confidence intervals (CI) for factors independently associated with current contraceptive use, adjusting for potential confounders. Fisher's exact test results were explicitly reported for small-cell comparisons. A p-value<0.05 was considered statistically significant. All tests were two-tailed.

RESULTS

Out of the 103 postpartum women enrolled, the largest age group was 25–29 years (33.0%), followed by 20–24 years (29.1%), while only 9.7% were below 20 years and 10.7% were aged 35 years or above. The majority resided in urban areas (58.3%) and had at least secondary-level education, with 26.2% attaining higher education. Most participants were homemakers (79.6%), and nearly half belonged to the middle socioeconomic class (47.6%), with the rest distributed between lower (30.1%) and upper (22.3%) classes (Table 1).

Table 1: Demographic Characteristics of Postpartum Women Included in the Study (n=103)

Characteristics	Category	Frequency (%)
Age (Years)	<20	10 (9.7%)
	20–24	30 (29.1%)
	25–29	34 (33.0%)
	30–34	18 (17.5%)
	≥35	11 (10.7%)
Residence	Urban	60 (58.3%)
	Rural	43 (41.7%)
Education	No school	15 (14.6%)
	Primary	24 (23.3%)
	Secondary	37 (35.9%)
	Higher	27 (26.2%)
Occupation	Homemaker	82 (79.6%)
	Employed	21 (20.4%)
Socioeconomic status	Lower	31 (30.1%)
	Middle	49 (47.6%)
	Upper	23 (22.3%)

More than half of the participants were gravida 2–3 (54.4%), and parity of 2–3 was also most common (53.4%). Vaginal delivery was the predominant mode of the last childbirth (55.3%), followed by caesarean section (38.8%) and assisted delivery (5.8%). Most women delivered at term (78.6%), while 13.6% delivered preterm and 7.8% post-term. Regarding inter-pregnancy intervals, 39.8% reported less than 24 months since their previous birth. Exclusive breastfeeding was practiced by 46.6% of mothers, while 35.0% practiced partial breastfeeding, and 18.4% were not breastfeeding. A large proportion of women (83.5%) had heard about postpartum contraception, but only 59.2% received antenatal counseling on the topic. Postnatal counseling was slightly lower, reported by 53.4% of participants. When asked about accessibility, just over half (55.3%) described access to family planning services as easy, while 27.2% reported moderate access and 17.5% faced difficulty in obtaining services. Out of the 103 postpartum women enrolled at KMU-IMS, Kohat, 47.6% were currently using a postpartum contraceptive method, while 52.4% were not using any method at the time of the survey. Among the 49 users, the lactational amenorrhea method (LAM) was most common (28.6%), followed by condoms (22.4%), oral contraceptive pills (14.3%), copper IUDs (12.2%), implants (8.2%), injectables (6.1%), and tubal ligation (8.2%). Regarding timing of initiation, 38.8% began within six weeks postpartum, 26.5% within 48 hours, and 34.7% after six weeks (Table 2).

Table 2: Obstetric and Clinical History, Awareness, Counseling, and Access to Postpartum Women in the Study, Current Postpartum Contraceptive Use, Method Mix, and Timing of Initiation (n=103)

Characteristics	Category	Frequency (%)
Obstetric and Clinical History		
Gravida	G1	25 (24.3%)
	G2–3	56 (54.4%)
	≥G4	22 (21.4%)
Parity	P0–1	27 (26.2%)
	P2–3	55 (53.4%)
	≥P4	21 (20.4%)
Mode of Last Delivery	Vaginal	57 (55.3%)
	Assisted	6 (5.8%)
	Caesarean	40 (38.8%)
Gestational Age	Preterm	14 (13.6%)
	Term	81 (78.6%)
	Post-Term	8 (7.8%)
Previous IPI	<24 Months	41 (39.8%)
	≥24 Months	62 (60.2%)
Breastfeeding Status	Exclusive	48 (46.6%)
	Partial	36 (35.0%)
	None	19 (18.4%)
Awareness, Counseling, and Access		
Heard of Postpartum Contraception	Yes	86 (83.5%)
	No	17 (16.5%)
Antenatal Counseling	Yes	61 (59.2%)
	No	42 (40.8%)
Postnatal Counseling	Yes	55 (53.4%)
	No	48 (46.6%)
Access to Services	Easy	57 (55.3%)
	Moderate	28 (27.2%)
	Difficult	18 (17.5%)
Current Postpartum Contraceptive Use, Method Mix, and Timing of Initiation		
Current Use	Yes	49 (47.6%)

DOI: https://doi.org/10.54393/pjhs.v6i11.3490

	No	54 (52.4%)
Method Among Users (n=49)	LAM	14 (28.6%)
	Condoms	11 (22.4%)
	OCPs	7 (14.3%)
	Injectable	3 (6.1%)
	Implant	4 (8.2%)
	Copper IUD	6 (12.2%)
	Tubal ligation	4 (8.2%)
Timing of Initiation (n=49)	≤48 hours	13 (26.5%)
	≤6 weeks	19 (38.8%)
	>6 weeks	17 (34.7%)

Among the 54 non-users, the most frequently reported reason for avoiding contraception was lack of knowledge (11.1%), followed by the desire for another child soon (9.3%), fear of side effects (7.4%), and partner opposition (7.4%). Religious or personal beliefs accounted for 5.6% of non-use, while only 1.9% cited cost or availability barriers or were waiting for menses to return. None reported "other" reasons (Table 3).

Table 3: Reasons for Non-Use of Postpartum Contraception among Non-Users (n=54)

Reasons	Frequency (%)
Lack of Knowledge	6 (11.1%)
Fear of Side Effects	4 (7.4%)
Partner Opposition	4 (7.4%)
Religious/Personal Beliefs	3 (5.6%)
Desire for Another Child Soon	5 (9.3%)
Cost/Availability Barriers	1 (1.9%)
Waiting for Menses to Return	1 (1.9%)
Other	0 (0.0%)

Chi-square analysis was performed to examine associations between current contraceptive use and socio-demographic as well as obstetric characteristics. For variables with small expected cell counts (Age, Mode of Delivery, and Gestational Age), Fisher's exact test was applied to ensure statistical validity. No statistically significant associations were observed for most variables. However, a higher proportion of women with vaginal deliveries reported current use (57.9%) compared to those with caesarean (35.0%) or assisted deliveries (33.3%), and this difference approached significance (Pearson χ^2 = 5.458, df = 2, p=0.065; Fisher's exact p=0.071). Similarly, Age (Fisher's exact p = 0.286) and Gestational age (Fisher's exact, p = 0.518) showed no significant relationship with current contraceptive use (Table 4).

Table 4: Association of Demographic and Obstetric Variables with Current Contraceptive Use (n=103)

Variables	Categories	Current Use – No n (%)	Current Use – Yes n (%)	p-value
Age	<20	8 (80.0%)	2 (20.0%)	0.286[f]
	20–24	15 (50.0%)	15 (50.0%)	
	25–29	17 (50.0%)	17 (50.0%)	
	30–34	7 (38.9%)	11 (61.1%)	
	≥35	7 (63.6%)	4 (36.4%)	
Residence	Rural	23 (53.5%)	20 (46.5%)	0.855
	Urban	31 (51.7%)	29 (48.3%)	
Education	No school	9 (60.0%)	6 (40.0%)	0.565
	Primary	14 (58.3%)	10 (41.7%)	
	Secondary	16 (43.2%)	21 (56.8%)	
	Higher	15 (55.6%)	12 (44.4%)	
Occupation	Homemaker	41 (50.0%)	41 (50.0%)	0.463
	Employed	13 (61.9%)	8 (38.1%)	
SES	Lower	17 (54.8%)	14 (45.2%)	0.946
	Middle	25 (51.0%)	24 (49.0%)	
	Upper	12 (52.2%)	11 (47.8%)	
Gravida	G1	13 (52.0%)	12 (48.0%)	0.467
	G2–3	32 (57.1%)	24 (42.9%)	
	≥G4	9 (40.9%)	13 (59.1%)	
Parity	0–1	15 (55.6%)	12 (44.4%)	0.776
	2–3	27 (49.1%)	28 (50.9%)	
	≥P4	12 (57.1%)	9 (42.9%)	
Mode of Delivery	Vaginal	24 (42.1%)	33 (57.9%)	0.071[f]
	Caesarean	26 (65.0%)	14 (35.0%)	
	Assisted	4 (66.7%)	2 (33.3%)	
Gestational Age	Preterm	9 (64.3%)	5 (35.7%)	0.518[f]
	Term	42 (51.9%)	39 (48.1%)	
	Post-term	3 (37.5%)	5 (62.5%)	
IPI	<24 Months	21 (51.2%)	20 (48.8%)	0.842
	≥24 Months	33 (53.2%)	29 (46.8%)	
Breastfeeding	None	9 (47.4%)	10 (52.6%)	0.781
	Partial	18 (50.0%)	18 (50.0%)	
	Exclusive	27 (56.3%)	21 (43.8%)	

[f]Fisher's exact test used

After adjusting for potential confounders, none of the variables showed a statistically significant independent association with current contraceptive use. Women who delivered by caesarean section had slightly higher odds of contraceptive use (aOR = 2.69, 95% CI 1.03–7.00, p = 0.043), but this association was not strong enough to alter the overall trend of non-significance across variables. Other factors, such as higher education, postnatal counseling, urban residence, ease of service access, exclusive breastfeeding, inter-pregnancy interval, and parity ≥3 were not independently predictive of use. The logistic regression model demonstrated good fit (Hosmer–Lemeshow χ^2 = 9.14, df = 8, p = 0.33) and explained 14% of the variance (Nagelkerke R^2 = 0.14) in postpartum contraceptive use, with an overall classification accuracy of 68%. The analysis revealed that while certain trends (e.g., higher use among women with vaginal deliveries) approached significance, there were no statistically significant associations between demographic or obstetric factors and current postpartum contraceptive use. Fisher's exact tests confirmed the reliability of results

DOI: https://doi.org/10.54393/pjhs.v6i11.3490

where small sample cells existed. Overall, contraceptive use in this cohort appeared independent of most socio-demographic and obstetric factors, highlighting the potential influence of unmeasured factors such as personal beliefs, spousal communication, and counseling quality. After adjusting for potential confounders, none of the variables were significantly associated with current contraceptive use. Women with higher education had slightly lower odds of use compared to those with secondary or less education (aOR 0.87, 95% CI 0.34–2.23), and those who received postnatal counseling also showed a non-significant reduction in odds (aOR 0.83, 95% CI 0.36–1.91). Urban residence (aOR 1.49, 95% CI 0.64–3.48) and easier access to services (aOR 1.24, 95% CI 0.54–2.85) were associated with higher odds of use but without statistical significance. Exclusive breastfeeding (aOR 0.82, 95% CI 0.35–1.89), caesarean delivery (aOR 0.55, 95% CI 0.23–1.29), previous IPI <24 months (aOR 0.49, 95% CI 0.20–1.16), and parity ≥3 (aOR 0.92, 95% CI 0.32–2.63) also showed no significant independent effect (Table 5).

Table 5: Adjusted Odds Ratios for Factors Associated with Current Contraceptive Use (n=103)

Predictor	aOR	95% CI	p-value
Higher Education (≤secondary)	0.87	0.34–2.23	0.767
Postnatal Counseling (No)	0.83	0.36–1.91	0.662
Urban Residence (Rural)	1.49	0.64–3.48	0.353
Easy Access (Mod–Diff)	1.24	0.54–2.85	0.616
Exclusive Breastfeeding (Other)	0.82	0.35–1.89	0.634
Caesarean Delivery (Vag/Assisted)	0.55	0.23–1.29	0.167
Previous IPI <24 months (≥24 months)	0.49	0.20–1.16	0.106
Parity ≥3 (≤2)	0.92	0.32–2.63	0.876

The analysis reveals that natural methods, particularly LAM, remain the most frequently adopted choice among postpartum women, possibly due to cultural acceptability, ease of use, and immediate postpartum applicability. Barrier methods like condoms also showed relatively high uptake, reflecting either preference for non-hormonal options or limited access to long-term methods. The lower adoption of injectables and implants suggests either limited availability, cost barriers, or a lack of awareness. These findings underscore the importance of postpartum counseling to promote a wider range of modern contraceptive options, especially those with longer duration of action. The bar chart illustrates the distribution of various contraceptive methods used by postpartum women currently practicing contraception. Lactational Amenorrhea Method (LAM) was the most commonly used method (28.6%), followed by condoms (22.4%), copper intrauterine devices (IUDs) (12.2%), and oral contraceptive pills (14.3%). Implants and tubal ligation were used by 8.2% each, while injectables were the least common (6.1%) (Figure 1).

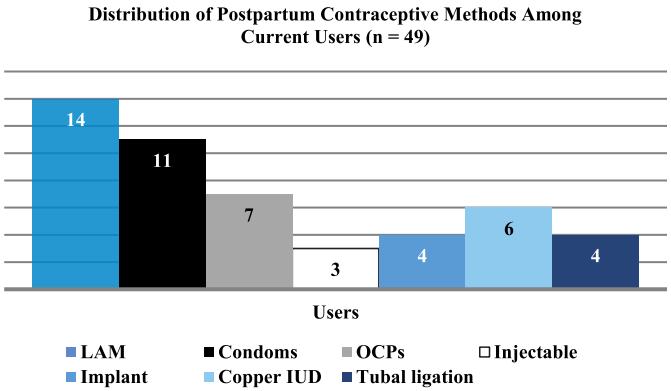

Figure 1: Distribution of Postpartum Contraceptive Methods Among Current Users (n=49)

DISCUSSION

The present study explored the prevalence, patterns, and determinants of postpartum contraceptive use among women attending a tertiary care facility in Kohat, Pakistan. The findings revealed that less than half of the participants (47.6%) were currently using any method of postpartum contraception, with Lactational Amenorrhea Method (LAM) and condoms being the most common. Despite relatively high awareness levels (83.5%), the uptake remained suboptimal, underscoring a persistent gap between knowledge and practice. The observed contraceptive prevalence aligns with a previous Pakistani study by Irum, *et al.* (which reported 45% usage among postpartum women, suggesting that similar socio-cultural and service-related barriers may operate across regions [13]. Conversely, our rate is higher than the 32% reported by Hashmi *et al.* in rural Sindh, possibly reflecting better urban access to services in our study population [14]. Internationally, uptake in our cohort was lower than in Ethiopia (55.7%) as reported by Tafa *et al.* [15] and Kenya (61.2%) as per Thiongo *et al.* where stronger integration of family planning into maternal care has been emphasized [16]. Multivariate analysis in our study did not identify statistically significant predictors after adjustment, although trends suggested higher use among women with urban residence, easier access to services, and parity ≤2. This contrasts with findings from Zimmerman et al. and Khan in Bangladesh in Ethiopia and where higher education and postnatal counseling were strong predictors [17, 18]. The lack of significance in our setting may reflect a relatively small sample size, limiting statistical power, or overlapping influences of multiple socio-demographic factors. Only 53.4% of women received postnatal counseling, and contraceptive use did not significantly differ by counseling status in the adjusted model. However, consistent with previous evidence [19, 20], structured and repeated postnatal counseling remains a vital determinant of postpartum contraceptive adoption. Strengthening

DOI: https://doi.org/10.54393/pjhs.v6i11.3490

integration of family planning messages into postnatal visits, immunization services, and home follow-ups could improve uptake and continuity of use. Fear of side effects, partner opposition, and cultural misconceptions emerged as major reasons for non-use [18]. To address these, culturally tailored counseling sessions, active male partner involvement, and community-based outreach programs are essential. Empowering healthcare workers to provide reassurance about side effects and to promote spousal communication may further improve acceptance. These strategies, supported by evidence from similar contexts, can bridge the gap between awareness and practice. Breastfeeding status also influenced contraceptive choice, with LAM being the most frequently adopted method among exclusively breastfeeding women. While LAM is effective for the first six months postpartum under correct use, reliance on it without timely transition to other methods increases the risk of unintended pregnancies, as highlighted by WHO guidelines (WHO, 2023) and recent findings by Rehman *et al.* in Pakistan [21]. Overall, our study reinforces the need for multi-pronged strategies combining health system strengthening, targeted counseling, male involvement, and improved service accessibility to increase postpartum contraceptive uptake.

The cross-sectional design limits the ability to establish causal relationships between identified factors and postpartum contraceptive use. Additionally, the use of consecutive non-probability sampling in a single tertiary care setting may restrict generalizability and introduce selection bias. Future multicenter longitudinal studies using probability sampling are recommended to better establish causal associations and enhance the generalizability of findings.

CONCLUSIONS

Postpartum contraceptive uptake in Kohat remains moderate but below optimal levels required to prevent unintended pregnancies and short inter-pregnancy intervals. Despite high awareness, barriers such as fear of side effects, partner opposition, and limited counseling continue to hinder use. Although no predictor reached statistical significance, trends suggest that improving postnatal counseling, expanding service accessibility, and implementing culturally sensitive, male-inclusive interventions may help increase acceptance and support greater utilization of postpartum contraception.

Authors' Contribution

Conceptualization: MS
Methodology: MS, FG, RM, LM, SF, MT
Formal analysis: MS, FG, LM
Writing and Drafting: MS, RM, LM, SF, MT
Review and Editing: MS, FG, RM, LM, SF, MT

All authors approved the final manuscript and take responsibility for the integrity of the work

Conflicts of Interest

All the authors declare no conflict of interest.

Source of Funding

The author received no financial support for the research, authorship and/or publication of this article.

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