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FACTORS AFFECTING ACCEPTIBILITY OF DEPOT MEDROXY PROGESTERONE ACETATE AND COPPER T 380A AS CONTRACEPTIVE METHODS

Surbhi Joshi[1], YM Mala[2], Shakun Tyagi[3]

[1]Assistant Professor, Department of Obstetrics and Gnaecology, Santosh Medical College Deemed to be University, Ghaziabad, Uttar Pradesh, India
[2]HOD, Department of Obstetrics and Gynaecology, Maulana Azad Medical College, Delhi, India
[3]Professor, Department of Obstetrics and Gynaecology, Maulana Azad Medical College, Delhi, India

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Corresponding Author:
Dr. Surbhi Joshi,
Assistant Professor, Department of Obstetrics and Gnaecology, Santosh medical college deemed to be university, Ghaziabad, Uttar Pradesh, India.
Email: surbhijoshi374@gmail.com

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ABSTRACT

Background: Depot Medroxyprogesterone Acetate (DMPA) and Copper T 380A (CuT 380A) are widely used long-acting reversible contraceptive methods in India. However, their acceptability is influenced by multiple factors including socio-demographic characteristics, knowledge and attitudes, side-effect profile, continuation rates, and satisfaction levels. This study aimed to evaluate and compare the factors affecting acceptability of DMPA and CuT 380A among women attending a family planning clinic in a tertiary care hospital.

Materials and Methods: This ambispective observational study was conducted in the Family Planning Outpatient Department of the Department of Obstetrics and Gynaecology, Maulana Azad Medical College and Lok Nayak Hospital, New Delhi. A total of 172 women were included, with 86 women each in the DMPA and CuT 380A groups. Retrospective data (n = 160) from 2017–2018 and prospective data (n = 12) from 2021 were analyzed. Sociodemographic profile, obstetric characteristics, knowledge and attitude, reasons for method choice, side effects, continuation/discontinuation patterns, and satisfaction levels were assessed using structured proforma and telephonic interviews. Data were analysed using SPSS version 17.0 with appropriate statistical tests, and $p < 0.05$ was considered statistically significant.

Results: The mean age of participants was comparable between the two groups (DMPA: 29.8 ± 6.0 years vs CuT 380A: 29.2 ± 5.8 years; $p = 0.527$). A significantly higher proportion of breastfeeding women opted for DMPA (53.5% vs 34.9%; $p = 0.014$), while CuT 380A users mostly belonged to the middle socioeconomic class ($p = 0.045$). Amenorrhea (33.7%), intermenstrual bleeding (32.6%) and weight gain (12.8%) were the most common side effects among DMPA users, whereas CuT 380A users commonly reported backache and lower abdominal pain (22.1%) and dyspareunia (16.2%). Discontinuation at 3 years was significantly higher in the DMPA group compared to the CuT group (96.3% vs 55.0%; $p < 0.001$). Satisfaction was significantly higher among CuT 380A users, with 48.8% being very satisfied compared to none in the DMPA group ($p < 0.001$).

Conclusion: Acceptability of DMPA and CuT 380A is influenced by a combination of socioeconomic factors, breastfeeding status, knowledge of side effects, perceived method advantages, and side-effect profile. While DMPA was more preferred among lactating women and those concerned about privacy and reversibility, CuT 380A demonstrated better long-term continuation and satisfaction rates. Comprehensive, individualized contraceptive counselling focusing on side effects, duration of action and user expectations is essential to improve uptake and sustained use of both methods.

Keywords: DMPA; Copper T 380A; Contraceptive acceptability; Discontinuation; Side effects.

INTRODUCTION

Population stabilization remains a core public-health challenge in India, where unmet need for contraception in the reproductive-age population contributes significantly to unintended pregnancies, maternal morbidity and mortality, and neonatal risks. Hence, promoting effective, acceptable, and sustainable contraceptive methods is central to reproductive health policy.[1] Long-acting reversible contraceptives (LARCs), which require minimal maintenance and have high effectiveness, are recommended for spacing or limiting births.[2]

Two commonly offered LARCs are Depot Medroxyprogesterone Acetate (DMPA), an injectable progestogen, and Copper T 380A (CuT-380A), a non-hormonal intrauterine contraceptive device (IUCD).[3] DMPA is administered every three months and is highly efficacious when used correctly; the typical first–year failure rate under perfect use is about 0.3%.[4] Its advantages include: no requirement for daily intake (unlike oral pills), independence from sexual act timing, reversibility, and suitability for women who prefer non–daily methods.[4] However, real-world continuation and acceptability are often suboptimal.[5,6]

CuT-380A, on the other hand, provides long-term contraception, is hormone-free, and once inserted can remain effective for many years (often up to 10 years).[7] Several studies from India report low to modest acceptability.[8,9] Common reasons for non-acceptance or discontinuation included fear of side effects, misconceptions about IUCDs, family/husband objections, and lack of adequate counselling or awareness.[8,9]

Importantly, method "acceptability" is multidimensional, not only clinical safety and efficacy, but also socio-demographic factors (age, parity), educational level, socio-economic status, previous contraceptive experience, fertility desires, partner/family support, perceived side-effects, myths and misconceptions, and quality of counselling.[10]

These data underline that despite comparable effectiveness and availability (especially under public health programs), uptake and sustained use of DMPA and CuT-380A remain suboptimal.[11,12] Under-utilization reflects not just lack of supply, but deeper issues of acceptability, including cultural norms, fear of side effects, misconceptions, insufficient counselling, partner/family influence, and method-specific concerns such as hormonal effects, bleeding pattern changes, device expulsion.[12] Understanding these factors is critical: increasing acceptability and continuity of LARC use can substantially reduce unintended pregnancies, lessen the burden on maternal and child health, and advance public health goals of population stabilization.

Hence, the present study aims to evaluate and compare the determinants influencing acceptability and continuation of DMPA versus CuT-380A among women of reproductive age in our setting, considering socio-demographic, reproductive history, informational and counselling factors, fertility intention, partner/family influence, and perceived or experienced side-effects. Such an analysis can generate context-specific evidence to inform family-planning counselling, method provision strategies, and policy to improve LARC utilization.

MATERIALS AND METHODS

Study Design and Setting: This ambispective observational study was conducted in the Family Planning Outpatient Department (FP-OPD) of the Department of Obstetrics and Gynaecology, Maulana Azad Medical College and associated Lok Nayak Hospital, New Delhi, a large tertiary care teaching hospital catering to an urban, peri-urban, and referral population from neighbouring states. The study included both retrospective and prospective components. The retrospective part involved women who had opted for either Depot Medroxyprogesterone Acetate (DMPA) or Copper T 380A during the years 2017 and 2018, while the prospective part included women who opted for either method in the year 2021. The ambispective design was necessitated due to temporary disruption of routine family planning services when the hospital was converted into a dedicated COVID-19 facility from April 2019 to January 2020 and again from April to June 2020.

Study Population and Eligibility Criteria

The study population consisted of women attending the FP-OPD seeking contraceptive counselling and who chose either DMPA injection or Copper T 380A intrauterine contraceptive device as their method of contraception. Women who had post-partum IUCD (PPIUCD) insertions were excluded from the study to avoid confounding due to the different physiological and clinical context of postpartum insertion. Patients whose records were untraceable or incomplete were also excluded from the analysis. Women with known contraindications to DMPA, such as unexplained vaginal bleeding, known or suspected breast malignancy or severe hepatic dysfunction, and those with contraindications to Copper T 380A, such as active pelvic infection, uterine anomalies, genital tract malignancy or suspected pregnancy, were excluded. Participation was voluntary, and only women who gave informed consent for telephonic or in-person interviews were included.

Sample Size Estimation

The sample size was calculated based on the continuation rate after the first DMPA injection reported by Michelle Fonseca et al., where the continuation rate was 27%. Using the formula:

$n=Z\alpha 2\times p\times q/d2$, where $Z\alpha=1.96$ at 95% confidence interval, p=27%, q=73%, and precision d=10%. The calculated minimum sample size was 76 women per group. To ensure adequacy and account for potential

missing data, 80 women were included in each group in the retrospective arm (DMPA group = 80, CuT-380A group = 80), making a total of 160 women. In the prospective arm, an additional 12 women (DMPA = 6, CuT-380A = 6) were recruited, bringing the total sample size to 172 participants.

Data Collection Procedure

In the retrospective component, socio-demographic data, obstetric and contraceptive history, contact details, counselling records, and follow-up information were extracted from the records maintained in the Family Planning Department. These women were subsequently contacted telephonically and interviewed using a structured questionnaire in the local language to obtain information regarding duration of contraceptive use, continuation or discontinuation, reasons for discontinuation, side effects experienced, switching of method, and overall satisfaction. Follow-up information for up to three years after initiation of contraception was collected wherever possible.

In the prospective component, women who opted for DMPA or Copper T 380A in the year 2021 were recruited after obtaining written informed consent. They were counselled using standardized departmental protocols, and baseline socio-demographic and reproductive health data were recorded. These women were then followed up for a period of six months through clinic visits and/or telephonic interviews. During follow-up, information regarding continuation, side effects, discontinuation, and change of method, if any, was recorded using the same questionnaire for uniformity.

All interviews were conducted ensuring privacy and confidentiality. The questionnaire included sections on age, educational status, occupation, socioeconomic status, parity, family size, desire for future pregnancy, prior contraceptive use, source of information about contraception, involvement of partner or family in decision-making, and perception regarding side effects.

Operational Definitions

Acceptability was defined as the willingness and actual adoption of either DMPA or Copper T 380A following counselling. Continuation was defined as uninterrupted use of the chosen method for the intended duration (three months for each DMPA dose and continued in situ presence for Copper T). Discontinuation was defined as stopping the method before the recommended duration or removal of IUCD due to medical or personal reasons.

Statistical Analysis

Statistical analysis was carried out using the Statistical Package for Social Sciences (SPSS) software for Windows, version 17.0 (SPSS Inc., Chicago, Illinois). Continuous variables such as age and duration of contraceptive use were expressed as mean ± standard deviation (SD), while categorical variables such as education level, parity, reasons for discontinuation, and side effects were expressed as frequencies and percentages. Normally distributed continuous variables were compared between the two groups using the unpaired Student's t-test, while the Mann–Whitney U test was applied for non-normally distributed variables. Categorical variables were analyzed using the Chi-square test or Fisher's exact test where appropriate. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations

The study was conducted after obtaining approval from the Institutional Ethics Committee of Maulana Azad Medical College, New Delhi. Informed consent was obtained from all participants before enrollment or telephonic interview. Participants were assured that their participation was voluntary and that refusal would not affect their clinical care. Confidentiality of all personal information was strictly maintained throughout the study, and data were used solely for research purposes.

RESULTS

The study included 172 women, with 86 participants each in the DMPA and CuT-380A groups. The majority belonged to the 20–30-year age group (DMPA: 58.1%; CuT 380A: 69.8%) with no significant difference in age distribution (p = 0.545). The mean age was comparable between the two groups (29.8 ± 6.0 vs 29.2 ± 5.8 years, p = 0.527). Most participants were urban residents (DMPA: 95.3%; CuT: 100%). Socioeconomic status differed significantly, with more women belonging to the lower class in the DMPA group (54.7%) compared to the CuT group, where the majority were from the middle class (70.9%, p = 0.045). Nuclear family structure was common in both groups (DMPA: 69.8%, CuT: 61.6%). Most women were multiparous (DMPA: 76.7%, CuT: 79.1%), and parity distribution did not differ significantly (p = 0.307). Medical comorbidities were present in only 5.8% of DMPA users and none in CuT users (p = 0.399). Most women were interval cases (DMPA: 86%, CuT: 89.5%). A significantly higher proportion of breastfeeding women opted for DMPA compared to CuT 380A (53.5% vs 34.9%, p = 0.014) [Table 1].

Table 1: Baseline Sociodemographic and Clinical Characteristics of Study Participants.

Variable	DMPA Group (n = 86)	CuT 380A Group (n = 86)	P value
	Frequency (%)/Mean ± SD		
Age Group (years)			
20–30	50 (58.1%)	60 (69.8%)	0.545
31–40	25 (29.1%)	20 (23.3%)	
41–45	11 (12.8%)	6 (7.0%)	

Age (years)	29.8 ± 6.0	29.2 ± 5.8	0.527
Residence			
Urban	82 (95.3%)	86 (100.0%)	0.764
Rural	4 (4.7%)	0 (0.0%)	
Socioeconomic Status			
Lower class	47 (54.7%)	12 (14.0%)	0.045
Middle class	39 (45.3%)	61 (70.9%)	
Upper class	0 (0.0%)	13 (15.1%)	
Type of Family			
Nuclear family	60 (69.8%)	53 (61.6%)	0.657
Joint/extended family	26 (30.2%)	33 (38.4%)	
Parity			
Nulliparous	4 (4.7%)	0 (0.0%)	0.307
Primiparous	16 (18.6%)	18 (20.9%)	
Multiparous	66 (76.7%)	68 (79.1%)	
Comorbidity			
Present	5 (5.8%)	0 (0.0%)	0.399
Absent	81 (94.2%)	86 (100.0%)	
Timing of Contraception			
Interval (6 weeks post-partum)	74 (86.0%)	77 (89.5%)	0.485
Post-abortion	12 (14.0%)	9 (10.5%)	
Breastfeeding Status			
Breastfeeding	46 (53.5%)	30 (34.9%)	0.014
Not breastfeeding	40 (46.5%)	56 (65.1%)	

DMPA = Depot Medroxyprogesterone Acetate; CuT = Copper T 380A.

Knowledge about LARC did not differ significantly between the two groups (p = 0.490), with about one-third of women in each group having complete knowledge. ASHA workers were the most common source of information in both groups (DMPA: 47.7%; CuT: 38.4%), followed by gynaecologists and family physicians, with no statistically significant difference in source distribution (p = 0.251). However, significantly more DMPA users had prior knowledge about side effects compared to CuT users (60.5% vs 34.9%, p = 0.001). Regarding ideal spacing interval, most DMPA users preferred a 2-year spacing (40.7%), whereas CuT users most commonly preferred a 3-year interval (37.2%), and this difference was statistically significant (p = 0.048), The most common reason for choosing DMPA was that it was comfortable and easy to use (19.8%), followed by counselling by ASHA and long duration of action. In contrast, the majority of CuT users chose the method based on their doctor's recommendation (37.2%), followed by ASHA counselling (18.6%) and one-time use (16.3%). Reasons such as comfort, reversibility, efficacy, safety, confidentiality and privacy were significantly more cited in the DMPA group, whereas one-time use was significantly more associated with CuT 380A (p < 0.001). These findings reflect different motivational patterns affecting the acceptability of the two methods [Table 2].

Table 2: Knowledge, Source of Information and Attitude Regarding Contraception.

Variable	DMPA Group (n = 86)	CuT 380A Group (n = 86)	P value
	Frequency (%)		
Knowledge about LARC			
No knowledge	24 (27.9%)	25 (29.1%)	0.490
Incomplete knowledge	32 (37.2%)	25 (29.1%)	
Complete knowledge	30 (34.9%)	36 (41.9%)	
Source of Knowledge			
Accredited Social Health Activist (ASHA)	41 (47.7%)	33 (38.4%)	0.251
Gynaecologists	20 (23.3%)	20 (23.3%)	
Family Physician	10 (11.6%)	16 (18.6%)	
TV / Radio	8 (9.3%)	4 (4.7%)	
Friends	7 (8.1%)	9 (10.5%)	
Mother	0 (0.0%)	1 (1.2%)	
Others	0 (0.0%)	3 (3.5%)	
Prior knowledge			
Had prior knowledge of side effects	52 (60.5%)	30 (34.9%)	0.001
No prior knowledge	34 (39.5%)	56 (65.1%)	
Perceived Ideal Spacing Interval			
1 year	0 (0.0)	0 (0.0)	0.048
2 years	35 (40.7)	0 (0.0)	
3 years	0 (0.0)	32 (37.2)	
>3 years / Others	51 (59.3)	54 (62.8)	
Reason for choosing			
Doctor's consultation	10 (11.6%)	32 (37.2%)	<0.001
Counselling by ASHA	11 (12.7%)	16 (18.6%)	0.295
Friends' advice	3 (3.5%)	9 (10.5%)	0.073

Comfortable and easy to use	17 (19.8%)	0 (0.0%)	<0.001
Long duration of action	11 (12.8%)	11 (12.8%)	1.000
Reversibility	11 (12.8%)	0 (0.0%)	<0.001
Efficacious	7 (8.1%)	0 (0.0%)	0.007
Safety	7 (8.1%)	0 (0.0%)	0.007
Confidentiality	5 (5.8%)	0 (0.0%)	0.023
Privacy	4 (4.7%)	0 (0.0%)	0.043
Less follow-up	0 (0.0%)	2 (2.3%)	0.155
One-time use	0 (0.0%)	14 (16.3%)	<0.001
Previous experience	0 (0.0%)	1 (1.2%)	0.316

LARC = Long-Acting Reversible Contraception; ASHA = Accredited Social Health Activist.

Side-effect profiles differed significantly between the two methods. In the DMPA group, amenorrhea (33.7%), intermenstrual bleeding (32.6%) and weight gain (12.8%) were the most frequently reported adverse effects. In contrast, CuT users most commonly experienced backache and lower abdominal pain (22.1%) followed by dyspareunia (16.2%) and heavy menstrual bleeding (7%). Amenorrhea and weight gain were significantly associated with DMPA use ($p < 0.001$), while backache and dyspareunia were significantly more common in CuT users ($p = 0.002$ and $p = 0.013$ respectively) [Table 3].

Table 3: Side Effects Experienced During Use of Contraceptive Methods.

Side Effects	DMPA Group (n = 86)	CuT 380A Group (n = 86)	P value
	Frequency (%)		
Intermenstrual bleeding	22 (32.6)	4 (5.8)	<0.001
Heavy menstrual bleeding	2 (3.5)	2 (7.0)	0.148
Amenorrhea	30 (33.7)	0 (0.0)	<0.001
Backache & lower abdominal pain	6 (7.0)	21 (22.1)	0.002
Mood swings	1 (2.3)	0 (0.0)	0.316
Dyspareunia	4 (4.6)	14 (16.2)	0.013
Weight gain	14 (12.8)	0 (0.0)	<0.001
Headache/dizziness	2 (2.3)	0 (0.0)	0.155
Breast tenderness	3 (2.3)	0 (0.0)	0.081
Reduced sex drive	1 (1.2)	0 (0.0)	0.316

In DMPA users, intermenstrual bleeding was more common during the early doses and reduced with subsequent doses ($p = 0.127$). Amenorrhea became more frequent with increasing number of injections, reaching 100% in women receiving ≥6 doses ($p < 0.001$). Weight gain was also significantly associated with longer duration of DMPA use ($p < 0.001$), while other side effects showed no clear dose-response relationship [Table 4].

Table 4. Effects of duration of use of DMPA (number of doses) on side effects.

Side Effects	Doses (Duration)												P value
	1 (N=10)	2 (N=34)	3 (N=7)	4 (N=7)	5 (N=6)	6 (N=1)	7 (N=4)	8 (N=3)	9 (N=2)	10 (N=1)	11 (N=2)	Still Using (N=9)	
Intermenstrual bleeding	0 (0%)	15 (44%)	3 (43.0%)	2 (29%)	1 (17%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (11.1%)	0.127
Heavy menstrual bleeding	0 (0%)	0 (0%)	1 (14.3%)	1 (14.3%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0.483
Amenorrhea	0 (0%)	4 (11.8%)	3 (42.9%)	4 (57.1%)	4 (66.7%)	1 (100%)	4 (100%)	3 (100%)	2 (100%)	1 (100%)	2 (100%)	2 (22.2%)	<0.001
Lower abdominal pain	0 (0%)	2 (5.9%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0.989
Mood swings	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (16.7%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0.263
Weight gain	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (16.7%)	1 (100%)	3 (75%)	3 (100%)	2 (100%)	1 (100%)	2 (100%)	1 (11.1%)	<0.001
Headache/Dizziness	0 (0%)	2 (5.9%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0.989
Breast tenderness	0 (0%)	1 (2.9%)	1 (14.3%)	1 (14.3%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0.856

Reduced sex drive	0 (0%)	0 (0%)	0 (0%)	0	1 (16.7 %)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0.26 3

Durations for CuT include months/years of use.

In the retrospective cohort, cumulative discontinuation was significantly higher among DMPA users compared to CuT users at all time points (55.2% vs 7.5% at 6 months; 96.3% vs 55% at 3 years; $p < 0.001$). In the prospective cohort, discontinuation at 6 months was 16.7% for CuT and 0% for DMPA ($p = 0.043$). The most common reason for discontinuation in both groups was side effects, but DMPA users also frequently cited inability to attend hospital (31.1%), while CuT users had unique causes such as device expulsion and method failure. Failure rate was 0% for DMPA and 2.3% for CuT, though not statistically significant ($p = 0.155$). The Pearl Index was 0 for DMPA and 0.8 per 100 woman-years for CuT. Satisfaction levels differed significantly, with 48.8% of CuT users being very satisfied compared to none in the DMPA group ($p < 0.001$) (Table 6).

Table 6: Discontinuation, Failure and Satisfaction Levels

Variable	DMPA Group (n = 86)	CuT 380A Group (n = 86)	P value
	Frequency (%)		
Cumulative discontinuation rate			
Duration (Reterospective n=80)			
6 months	44 (55.2%)	6 (7.5%)	<0.001
1 year	58 (72.5%)	24 (30.0%)	
2 years	72 (90.0%)	40 (50.0%)	
3 years	77 (96.3%)	44 (55.0%)	
Duration (Prospective n=6)			
6 months	0 (0.0%)	1 (16.7%)	0.043
Reason for Discontinuation			
Side effects	27 (35.0%)	28 (62.2%)	<0.001
Desire for conception	10 (13.0%)	10 (22.7%)	0.048
Switching to another method	14 (18.2%)	3 (6.7%)	0.039
Inability to attend hospital	24 (31.1%)	0 (0.0%)	<0.001
Expulsion	0 (0.0%)	2 (4.4%)	0.041
Failure of method	0 (0.0%)	2 (4.4%)	0.041
Failure rate			
Number of accidental pregnancies	0 (0.0%)	2 (2.3%)	0.155
Pearl Index (Retrospective) (per 100 woman-years)	0	0.8	0.123
Satisfaction Level			
Very Satisfied	0 (0.0%)	42 (48.8%)	<0.001
Moderately Satisfied	32 (37.2%)	11 (12.8%)	
Fully Satisfied	26 (30.2%)	0 (0.0%)	
Somewhat satisfied	0 (0.0%)	11 (12.8%)	
Not satisfied	28 (32.6%)	33 (38.4%)	

Pearl Index = number of pregnancies per 100 woman-years of use.

DISCUSSION

In this ambispective study comparing acceptability, side-effect profile, continuation, and satisfaction of Depot Medroxyprogesterone Acetate (DMPA) and Copper T 380A (CuT 380A) among 172 women, multiple factors influencing method choice and continuation emerged many aligning with previously published literature, but also offering context-specific insights relevant to our population. We observed that both DMPA and CuT groups had similar age distributions and mean ages (29.8 ± 6.0 vs 29.2 ± 5.8 years, $p = 0.527$), with majority in the 20–30 year-old bracket. This is consistent with other studies from Garde et al., and Jatlaoui et al., where injectable and IUCD acceptors often cluster in the younger reproductive age group.[13,14] For instance, earlier work has reported a predominance of 21–30 years among DMPA acceptors.[15]

Socioeconomic status, however, differed significantly between the two groups. While more than half of DMPA users belonged to the lower socioeconomic class, the CuT group had a predominance of middle and upper class women ($p = 0.045$). This suggests that socio-economic conditions may influence method choice, possibly because women from higher socioeconomic strata might have better access to information or greater concern for long-term spacing, making a long-acting IUCD more appealing.[16] Conversely, lower-income women may prefer DMPA for its low-maintenance and privacy. This socio-economic association is seldom emphasized in earlier studies, and may reflect cultural or accessibility differences in our setting.[17]

We did not find significant differences in parity distribution, family type, residence (urban/rural), or comorbidity between groups, implying that these factors did not substantially bias method selection in our sample.[18] The higher proportion of breastfeeding women choosing DMPA (53.5%) compared to CuT 380A (34.9%, $p = 0.014$) reflects wider acceptability of injectable progestin methods in lactating women, likely due to convenience, assurance of reversibility, and perceived minimal

effect on lactation, a point similarly noted in studies by Mude et al., and Jairaj et al., on DMPA in postpartum contexts.[19,20]

Knowledge about LARC (long-acting reversible contraception) did not differ significantly between the groups. Approximately one-third of women in each group had "complete knowledge." The most common source of information overall was community health workers (ASHA), followed by gynaecologists and family physicians. This underscores the critical role of frontline health workers in disseminating contraceptive information, consistent with other Indian settings where ASHA-led counselling significantly influenced contraceptive uptake.[21]

Interestingly, a significantly higher proportion of DMPA users had prior knowledge of side effects than CuT users (60.5% vs 34.9%, p = 0.001). This could indicate that awareness of potential menstrual or systemic changes (e.g., amenorrhea, weight gain) may influence choice of method: women more informed about side effects may choose DMPA anticipating amenorrhea or predictable pattern, whereas those with limited side-effect awareness may opt for CuT unaware of possible consequences.[22] This highlights that beyond simple method knowledge, depth of side-effect knowledge could shape acceptability and underscores the importance of comprehensive counselling.[23]

Regarding ideal birth spacing, more DMPA users favored a 2-year interval, while CuT users favored 3 years (p = 0.048). This difference may reflect perceived method duration or personal reproductive goals; DMPA, being a 3-monthly injectable, may be seen as more flexible, whereas CuT 380A, a long-acting IUCD, may lead to preference for longer intervals. This attitudinal difference may influence method choice and aligns with the notion that contraceptive counseling should consider individual fertility intentions.[24,25]

Our data show diverging motivations behind method selection. DMPA was often chosen for comfort and ease of use (19.8%), along with reversibility, privacy, confidentiality, and minimal required follow-up. In contrast, CuT 380A was primarily chosen on a doctor's recommendation (37.2%), followed by ASHA counselling and the advantage of one-time use. The striking contrast (e.g., 0% of CuT users citing "comfortable and easy to use" or "reversibility" vs nearly 20% of DMPA users) underscores how method attributes interact differently with user preferences. These findings are consistent with prior Indian studies by Rajaraman et al., and Ray et al., that identified convenience, user control, and discretion as major drivers for injectable contraceptive acceptance, especially among women concerned about frequent clinic visits or partner/family interference.[23,26] Meanwhile, for IUCD, provider recommendation remains a powerful influence, likely reflecting trust in medical advice and value placed on long-term spacing without repeated intervention.[22] Despite being effective and long-acting, CuT 380A demands initial insertion by a trained provider, which may explain why "doctor consultation" was the top reason for choosing it.

A key finding of this study is the contrasting side-effect patterns between DMPA and CuT 380A users. Among DMPA users, amenorrhea (33.7%), intermenstrual bleeding (32.6%) and weight gain (12.8%) were predominant. This is in line with the established pharmacological effects of progestin-only injectables: DMPA suppresses ovulation, leads to endometrial atrophy, and reduces menstrual bleeding, sometimes causing amenorrhea or irregular bleeding.[27] In contrast, CuT users most commonly reported backache and lower abdominal pain (22.1%), dyspareunia (16.2%), and heavy menstrual bleeding (7%). Higher rates of pelvic discomfort, dysmenorrhea, and increased bleeding/decrease in iron stores have been widely documented with copper IUCD use, especially in the months following insertion.[28]

These divergent side-effect profiles are not merely clinical, they influence acceptability, satisfaction, and continuation. For example, amenorrhea may be seen as a benefit (less bleeding) by many women, but for others, sudden cessation of menses can raise concerns about fertility, hormonal balance, or general health. Meanwhile, increased menstrual bleeding or pelvic pain from CuT may be perceived as disruptive to daily life or unacceptable culturally. As reviewed by Polis et al., and Rademacher et al., changes in bleeding patterns, termed contraceptive-induced menstrual bleeding changes (CIMBCs), are often cited as a major reason for non-use, method dissatisfaction or discontinuation.[29,30]

Analyzing side-effects over the course of DMPA doses showed that amenorrhea increased progressively with number of injections, achieving 100% prevalence among women with ≥6 doses ($p < 0.001$). Weight gain also increased with continued use ($p < 0.001$). Intermenstrual bleeding and other irregular bleeding were more frequent in early doses but tended to subside. This dose-dependent pattern is consistent with known pharmacodynamics: cumulative progestin exposure leads to progressive endometrial thinning, reduced shedding, and eventually amenorrhea.[27,28]

For CuT 380A, side effects such as heavy bleeding and abdominal pain were more common in early months and tended to decrease over time ($p = 0.232$ for heavy bleeding, $p < 0.001$ for pain), indicating a possible adaptation or uterine accommodation over time. This temporal decline in adverse symptoms has been seen in other cohort studies Gupta et al., and Dorairajan et al., of CuT 380A in Indian settings.[7,31]

These findings have practical implications: women should be counselled that side-effects especially bleeding and pain with CuT or irregular bleeding with DMPA are often transient, and many resolve with continued use. Such counseling can improve continuation rates.[31]

Discontinuation rates in our retrospective cohort were markedly higher among DMPA users compared

to CuT users (96.3% vs 55.0% at 3 years; $p < 0.001$). Prospective follow-up also showed higher early discontinuation for CuT (16.7%) than DMPA (0%) at 6 months, but over long-term DMPA was less sustainable. This pattern confirms observations from Samal et al., many DMPA users discontinue early due to side effects or visit-related burden, while CuT, though having insertion discomfort or bleeding, often retains more long-term adherents.[32]

Common reasons for discontinuation included side effects (both groups), desire for conception, switching methods, inability to attend hospital (mainly in DMPA), and expulsion or method failure (in CuT group). This complexity echoes findings from large-scale contraceptive cohort studies by Shete et al., and Tiwari et al., where side-effects, health concerns, convenience, and fertility intentions interplay in continuation decisions.[33,34] Failure rate in DMPA was 0%, while in CuT was 2.3% (Pearl Index 0.8/100 woman-years), which is still within acceptable "real-world" bounds for long-acting reversible contraception. This effectiveness aligns with known performance of copper IUDs globally.[35]

Satisfaction assessments revealed higher satisfaction among CuT users: nearly half (48.8%) were "very satisfied," compared to none in the DMPA group ($p < 0.001$). This suggests that, despite some side effects, long-acting, low-maintenance IUCDs may offer a better balance of efficacy, convenience, and user contentment in the long run, provided women are well counseled and expectations managed.[29]

Strengths and Limitations of the Study

A major strength of our study is the ambispective design, combining retrospective data over 3 years and prospective follow-up, allowing both long-term continuation analysis and up-to-date side-effect observation. Including both DMPA and CuT users in the same population enables direct comparison within the same social and health-system context which, as pointed out elsewhere, is rarely done in Indian studies under programmatic conditions.

However, there are limitations. First, as with all observational studies, there may be residual confounding, for instance, we did not collect detailed data on female education, religious beliefs, or partner attitudes, which may influence acceptability. Second, for the retrospective cohort, reliance on record-based follow-up and telephonic interviews could introduce recall bias. Third, although satisfaction and side effects were self-reported, objective measures (hemoglobin change, weight measurement) were not possible in all cases. Finally, method continuation beyond 3 years was not assessed, and reproductive outcomes beyond method failure (return to fertility) were not studied.

Implications & Recommendations

Our findings underscore the importance of personalized contraceptive counselling, matching method attributes with an individual woman's reproductive goals, lifestyle, and preferences. For example, for women desiring discreet, short-term spacing with flexibility, DMPA may be more acceptable; whereas women wanting long-term spacing with minimal maintenance may favor CuT 380A. However, counselling should clearly address expected side effects and their temporal pattern, emphasizing that many adverse effects (especially bleeding or pain) tend to subside with time. From a public health and program perspective, sale/distribution of both methods should be ensured, and health workers (especially ASHAs) should be trained to provide balanced information, manage side effects, and support follow-up, particularly for CuT users, where continuing method despite early symptoms may improve long-term continuation and satisfaction. Given the higher long-term satisfaction and lower failure rate with CuT in our study, wider promotion of IUCDs, while ensuring counselling and addressing myths/concerns, could strengthen contraceptive uptake and reduce unintended pregnancies. Similarly, DMPA remains a useful option for certain women, especially lactating mothers or those who value privacy, provided side-effect counselling and dose follow-up are ensured.

CONCLUSION

In our cohort, both DMPA and CuT 380A were acceptable forms of contraception, but differed markedly in reasons for choice, side-effect profiles, continuation, and satisfaction. Method choice was influenced by a combination of sociodemographic factors, prior knowledge, fertility intentions, and personal priorities such as privacy and convenience. CuT 380A offered better long-term satisfaction and continuation, whereas DMPA appealed more to breastfeeding women and those seeking flexibility. These findings highlight that method acceptability is multifaceted and context-specific. Programs should tailor counselling and service delivery accordingly to optimize contraceptive uptake and sustained use.

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