



Knowledge, Attitude, and Practice of Contraception among Rural Women of Reproductive Age: A Cross-Sectional Observational Study from Sub-Himalayan Uttarakhand, India.

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Abstract

Background: Family planning remains a critical public health priority in rural India. Despite national campaigns, contraceptive uptake in sub-Himalayan regions of Uttarakhand is suboptimal. Understanding the knowledge, attitude, and practice (KAP) of contraception is essential for designing targeted interventions. **Objectives:** To assess contraceptive KAP among married rural women of reproductive age (18–45 years) in Udham Singh Nagar, Uttarakhand, and to identify barriers and sociodemographic determinants of contraceptive use. **Methods:** A hospital-based cross-sectional observational study was conducted over 3 months (December 2025–February 2026), with active sample collection in January–February 2026. Two hundred and fifty (n=250) married rural women were enrolled by systematic random sampling at the OBG OPD of Ram Sumer Shukla Smriti Government Medical College, Rudrapur. A validated, pre-tested, semi-structured Hindi-language questionnaire assessed knowledge, attitude, and practice domains. Data were analyzed using IBM SPSS v26; chi-square and binary logistic regression were applied. **Results:** Mean age was 27.4 ± 5.8 years. Awareness of any contraceptive method was high (91.2%), yet only 20.8% demonstrated good knowledge. Positive attitude was recorded in 67.2% of participants. Current contraceptive use was 58.4%; tubectomy (42.5% of users) predominated. Myths/misconceptions (42.4%), fear of side effects (35.6%), and spousal opposition (28.8%) were leading barriers. Education (OR=2.84, 95% CI: 1.52–5.32), parity ≥ 2 (OR=4.12, 95% CI: 2.18–7.78), and husband's support (OR=3.68, 95% CI: 1.94–6.98) were significant independent predictors of contraceptive use ($p < 0.01$). **Conclusion:** A significant KAP gap persists among rural women in this region. Targeted behaviour change communication, community counselling, and active male-partner engagement are essential to improve contraceptive prevalence and achieve a balanced method-mix.

Keywords: Contraception, family planning, KAP study, rural women, Uttarakhand, unmet need.



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INTRODUCTION

Family planning is universally recognised as a cornerstone of reproductive health, women's empowerment, and sustainable development. [1] Access to safe and effective contraception enables women to exercise autonomy over reproductive decision-making, avert unintended pregnancies, and improve maternal and child health outcomes. [2] Globally, an estimated 1.1 billion women have a need for family planning; however, nearly 270 million still have unmet needs—predominantly in low- and middle-income countries including India. [4]

India's National Family Health Survey-5 (NFHS-5, 2019–21) reported an overall modern contraceptive prevalence rate (mCPR) of 56.5%, yet this figure masks considerable rural–urban and inter-state disparities. [2] In Uttarakhand, a hill state carved from Uttar Pradesh in 2000, NFHS-5 recorded an mCPR of approximately 60.2%; yet rural sub-Himalayan districts—including Udham Singh Nagar—face compounding challenges of low female literacy, patriarchal reproductive decision-making, and inadequate healthcare access. [3] Unmet need for contraception remains clinically significant in these settings, contributing to high-parity pregnancies, maternal anaemia, and preventable maternal deaths. [22]. A Knowledge, Attitude, and Practice (KAP) study is a validated investigative paradigm in reproductive health research. [5] It allows public health planners to systematically identify gaps between theoretical awareness, attitudinal disposition, and observable contraceptive behaviour. [6] Evidence from across India demonstrates that contraceptive awareness often precedes practice

by a wide margin—attitudinal, cultural, and spousal factors govern actual use far more powerfully than knowledge alone. [7] [8]. Udham Singh Nagar district, located in the terai (sub-Himalayan foothills) zone, harbours a demographically heterogeneous population—comprising indigenous communities, migrant agricultural labourers, and scheduled caste populations—making it a uniquely relevant and under-researched setting for a reproductive health KAP investigation. [9] District-level data on contraceptive KAP specific to this area are sparse. [10] Evidence-based programme planning demands such baseline information to tailor behavioural interventions appropriately. The present study was therefore undertaken to assess the knowledge, attitude, and practice of contraception among rural married women of reproductive age attending the OBG OPD of Ram Sumer Shukla Smriti Government Medical College (RSSGMC), Rudrapur, and to identify the barriers and sociodemographic determinants of contraceptive use in this population.

OBJECTIVES

Primary Objective

- To assess the knowledge, attitude, and practice of contraception among married rural women of reproductive age (18–45 years) attending the OBG OPD of RSSGMC, Rudrapur.

Secondary Objectives

- To determine the prevalence and pattern of current contraceptive use.
- To identify barriers to contraceptive uptake in the study population.
- To examine associations between sociodemographic characteristics and contraceptive use.
- To formulate evidence-based recommendations for strengthening family planning services in the district.

MATERIALS AND METHODS

Study Design and Setting

A hospital-based, cross-sectional observational study was conducted at the Department of Obstetrics & Gynaecology, Ram Sumer Shukla Smriti Government Medical College (RSSGMC), Rudrapur, Udham Singh Nagar, Uttarakhand. RSSGMC serves a large rural catchment population across the terai belt of Udham Singh Nagar, making it an appropriate institutional base for studying rural contraceptive behaviour.

Study Duration

The total study duration was 3 months (December 2025 – February 2026). The preparatory phase (protocol finalisation, questionnaire validation, IEC approval) was undertaken in December 2025. Active sample collection was carried out during January 2026 and February 2026.

Study Population

Married women of reproductive age (18–45 years) attending the OBG OPD of RSSGMC from rural areas of Udham Singh Nagar district.

Eligibility Criteria

Inclusion criteria:

- Married women aged 18–45 years.
- Resident of a rural area in Udham Singh Nagar district for ≥ 1 year.
- Willing and able to provide written informed consent.

Exclusion criteria:

- Women with clinically confirmed infertility or premature menopause.
- Women who were unmarried, divorced, separated, or widowed.
- Those who declined participation or withdrew consent.
- Incomplete questionnaire ($>20\%$ missing responses).

Sample Size

Sample size was calculated using the formula: $n = Z^2pq / d^2$, with expected contraceptive prevalence (p) = 58% (based on NFHS-5 Uttarakhand data), [2] confidence level = 95% ($Z=1.96$), and allowable error (d) = 10%, yielding $n=234$. Accounting for a 10% non-response rate, the target was 258; rounded operationally to 260. After excluding 10 questionnaires with $>20\%$ missing data, the final analysed sample was $n=250$.

Sampling Method

Systematic random sampling was employed. Women attending OBG OPD were assigned sequential attendance numbers; every 3rd eligible woman was invited to participate until the target sample was achieved.

Data Collection Instrument

A pre-tested, semi-structured, interviewer-administered questionnaire was developed in Hindi and back-translated into English for content validation. [11] The questionnaire comprised four sections:

- Section A – Sociodemographic profile (age, education, occupation, parity, religion, monthly income, husband's education/occupation).
- Section B – Knowledge of contraception (20 items covering awareness, types, mechanism, efficacy, availability, and correct use of methods).
- Section C – Attitude towards contraception (20-item, 4-point Likert scale; maximum score 80; score ≥ 52 defined as positive attitude).
- Section D – Practice of contraception (current use, method, source of supply, duration, reasons for non-use/discontinuation).

The instrument was validated by a panel of three senior OBG faculty members and piloted on 25 women not included in the final analysis. Cronbach's $\alpha=0.78$ indicated acceptable internal consistency. [11]

Ethical Approval

The study received approval from the Institutional Ethics Committee (IEC), RSSGMC, Rudrapur (Reference No.: IEC/RSSGMC/2025/118, dated 25 November 2025). Written informed consent was obtained from every participant prior to enrolment. Participant confidentiality was strictly maintained throughout. The study was conducted in accordance with the Declaration of Helsinki. [28]

Statistical Analysis

Data were double-entered and verified using IBM SPSS Statistics Version 26.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean $\pm$ standard deviation (SD); categorical variables as frequencies and percentages. Chi-square test (χ^2) was used to examine associations between categorical variables. Significant predictors identified by univariate analysis ($p < 0.20$) were entered into binary logistic regression to identify independent predictors of contraceptive use, expressed as adjusted odds ratios (AOR) with 95% confidence intervals (CI). A two-tailed p -value ≤ 0.05 was considered statistically significant.

RESULTS

Sociodemographic Profile of Participants

A total of 260 women were approached; 10 were excluded (incomplete responses), yielding a final sample of **n=250** (response rate: 96.2%). The sociodemographic characteristics are summarised in Table 1.

Table 1: Sociodemographic Characteristics of Study Participants (n=250)

Variable	Category	n (%)
Age (years)	18–24	62 (24.8%)
	25–30	93 (37.2%)
	31–35	55 (22.0%)
	36–45	40 (16.0%)
	Mean $\pm$ SD	27.4 $\pm$ 5.8 years
Education	Illiterate	48 (19.2%)
	Primary (Std 1–5)	52 (20.8%)
	Secondary (Std 6–10)	84 (33.6%)
	Higher Secondary & above	66 (26.4%)
Occupation	Homemaker	189 (75.6%)
	Agricultural worker	35 (14.0%)
	Daily wage labourer	16 (6.4%)
	Others	10 (4.0%)
Parity	Nulliparous	22 (8.8%)
	Primipara (1 child)	58 (23.2%)
	Multipara (2–3 children)	130 (52.0%)
	Grand multipara (≥ 4 children)	40 (16.0%)
Religion	Hindu	185 (74.0%)
	Muslim	48 (19.2%)
	Others	17 (6.8%)

The majority of participants were homemakers (75.6%) and had attained at least secondary education (60.0%). The largest parity group comprised multiparous women with 2–3 children (52.0%), indicative of higher-than-desired fertility in this population. [12]

Knowledge of Contraception

Awareness of at least one contraceptive method was high at 91.2% (n=228). Method-specific awareness and sources of information are presented in Table 2.

Table 2: Awareness of Contraceptive Methods and Source of Information (n=250)

Method	Awareness n (%)	Mass Media n (%)	Healthcare Worker n (%)
Any method	228 (91.2%)	—	—
Tubectomy	210 (84.0%)	88 (35.2%)	122 (48.8%)
Oral Contraceptive Pills	195 (78.0%)	102 (40.8%)	93 (37.2%)
Condom	176 (70.4%)	96 (38.4%)	80 (32.0%)
IUCD (Copper-T)	168 (67.2%)	70 (28.0%)	98 (39.2%)
Vasectomy	138 (55.2%)	54 (21.6%)	84 (33.6%)
Injectables (Antara)	112 (44.8%)	38 (15.2%)	74 (29.6%)
Natural methods	89 (35.6%)	30 (12.0%)	59 (23.6%)
Emergency Contraception	74 (29.6%)	42 (16.8%)	32 (12.8%)
Implants	46 (18.4%)	22 (8.8%)	24 (9.6%)

Tubectomy (84.0%) and oral contraceptive pills (78.0%) were the most widely recognised methods. Awareness of emergency contraception was notably poor (29.6%), consistent with findings by Kumar et al. [8] Healthcare workers served as the primary information source for permanent methods, while mass media was more influential for OCP awareness. [14]

Based on a 10-item knowledge score, **42.8%** of women had poor knowledge (score 0–4), **36.4%** had moderate knowledge (score 5–7), and only **20.8%** demonstrated good knowledge (score 8–10), revealing a profound awareness-knowledge gap. [15][16]

Attitude towards Contraception

On the 20-item attitude Likert scale (maximum score: 80), the mean attitude score was **54.6 ± 9.2**. A positive attitude (score ≥52) was recorded in **67.2%** (n=168) of participants. Key attitudinal findings included:

- **78.4% agreed that family planning improves maternal and child health.**
- **68.8% agreed it is a woman's right to choose her contraceptive method.**
- **62.4% felt their husbands supported contraceptive use.**
- **52.0% reported that religious beliefs influenced their contraceptive decisions.**
- **41.6% expressed concern about potential side effects of contraceptive methods.**

Attitudinal ambivalence was significantly associated with lower education (p<0.01) and greater parity, echoing national observations by Saha et al. [16] and Nair & Ramachandran. [17]

Practice of Contraception

Table 3: Contraceptive Use Status and Method Distribution (n=250)

Variable	n	Percentage
Current contraceptive users	146	58.4%
Never used	68	27.2%
Previously used, now discontinued	36	14.4%
Method (Among Current Users, n=146)	n (of total, 250)	% of Users
Tubectomy (permanent sterilisation)	62 (24.8%)	42.5%
Oral Contraceptive Pills (OCP)	40 (16.0%)	27.4%
Intrauterine Contraceptive Device (IUCD)	20 (8.0%)	13.7%
Male condom	12 (4.8%)	8.2%
Injectables (Antara)	8 (3.2%)	5.5%
Other methods	4 (1.6%)	2.7%

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The contraceptive prevalence rate (CPR) in our study was 58.4%, aligned with NFHS-5 estimates for Uttarakhand (60.2%). [2] Tubectomy dominated the method-mix (42.5% of users), reflecting the historical sterilisation-centric orientation of India's national family planning programme. [18] Spacing methods—IUCD (13.7%), injectables (5.5%), and condom (8.2%)—were markedly under-utilised. [19] This method-mix imbalance echoes findings from Singh & Agrawal in rural Dehradun [19] and represents a programme gap requiring urgent attention.

Barriers to Contraceptive Use

Among non-users and discontinuing users (n=104), multiple overlapping barriers were reported (multiple responses permitted):

Barrier	n	% (of non-users)
Myths and misconceptions about contraception	44	42.4%
Fear of side effects	37	35.6%
Desire for more children	28	26.9%
Husband's / family opposition	30	28.8%
Religious objection	22	21.2%
Method not available locally	18	17.3%

Among women who had discontinued contraception (n=36), side effects constituted the leading reason (50.0%, n=18), followed by spousal opposition (27.8%, n=10). [20] These findings are consistent with national and regional evidence emphasising social-behavioural barriers over supply-side constraints. [23] Sociodemographic Predictors of Contraceptive Use.

Table 4: Sociodemographic Factors Associated with Contraceptive Use (n=250)

Variable	Users n (%)	Non-users n (%)	χ^2	p-value
Education			18.72	<0.001
Illiterate	18 (37.5%)	30 (62.5%)		
Primary	24 (46.2%)	28 (53.8%)		
Secondary	58 (69.0%)	26 (31.0%)		
Higher Sec.+	46 (69.7%)	20 (30.3%)		
Parity			32.14	<0.001
Nulliparous	4 (18.2%)	18 (81.8%)		
Primipara	22 (37.9%)	36 (62.1%)		
Multipara (2–3)	98 (75.4%)	32 (24.6%)		
Grand multipara (≥ 4)	22 (55.0%)	18 (45.0%)		
Husband's support			24.56	<0.001
Yes	112 (71.8%)	44 (28.2%)		
No	34 (36.2%)	60 (63.8%)		

Binary logistic regression identified three independent predictors of contraceptive use (Table 4):

- Secondary education or above (AOR=2.84; 95% CI: 1.52–5.32; $p<0.001$)
- Parity ≥ 2 (AOR=4.12; 95% CI: 2.18–7.78; $p<0.001$)
- Husband's support (AOR=3.68; 95% CI: 1.94–6.98; $p<0.001$)

These findings reinforce the central roles of female empowerment and male-partner engagement as modifiable determinants of contraceptive uptake, consistent with national-level evidence. [21][11]

DISCUSSION

The present study examined contraceptive KAP among 250 married rural women attending the OBG OPD of RSSGMC, Rudrapur, providing district-specific baseline data for Udham Singh Nagar—an area hitherto underrepresented in contraceptive research.

The overall awareness of any contraceptive method (91.2%) in our study was high and consistent with NFHS-5 national estimates ($>90\%$). [2] This aligns with Sharma et al. from rural Uttarakhand (89.3%) [12] and Pandey et al. from NFHS-4 national data (92.0%). [21] High awareness is attributable to the penetration of mass-media campaigns, ASHA worker community outreach, and the Mission Parivar Vikas initiative targeting high-fertility districts. [26] However, awareness should not be conflated with adequate knowledge; our finding that 79.2% of women demonstrated poor or moderate

knowledge underscores a significant ‘awareness-knowledge gap’ mirroring Saha et al. [16] Emergency contraception knowledge was especially low (29.6%), consistent with Kumar et al. (30.2%). [8]

The CPR of 58.4% in our study aligns with NFHS-5 data for Uttarakhand (60.2%). [2] Nonetheless, it falls short of the National Programme target of 65% mCPR by 2025. [25] The predominance of tubectomy (42.5% of users) reflects the long-standing sterilisation-centric orientation of India’s family planning programme—a pattern documented nationally by the Registrar General of India [3] and highlighted as a concern by the Population Council. [23] The markedly low uptake of spacing methods—IUCDs (13.7%), injectables (5.5%), condoms (8.2%)—limits reproductive choice and mirrors findings from comparable settings. [19][24]

Myths and misconceptions (42.4%) emerged as the predominant barrier in our study, followed by fear of side effects (35.6%) and spousal opposition (28.8%). These findings echo Gursansky & Mourato [20] and Population Council reports [23] and underscore the primacy of behavioural and social determinants over supply-side constraints. The unmet need observed among non-users who desired no further pregnancies but were not using contraception aligns with Casterline & Sinding’s seminal framework [14] and national data compiled by Taneja et al. [27]

Spousal support emerged as among the strongest independent predictors of contraceptive use (AOR=3.68, $p<0.001$)—corroborating Char et al. in rural India [29] and reinforcing WHO recommendations on gender-sensitive, couple-oriented family planning service delivery. [28] Magon emphasises that comprehensive gynaecological counselling—addressing both partners—is fundamental to sustained contraceptive use. [30] Educational attainment was similarly significant (AOR=2.84, $p<0.001$), consistent with Malhotra et al.’s framework of women’s empowerment and reproductive autonomy. [11] Parity ≥ 2 was the strongest predictor (AOR=4.12), reflecting the post-childbearing motivation to limit family size—a well-established demographic pattern. [15]

The present study’s limitations include its hospital-based design, which may overrepresent health-seeking women and underrepresent those with greatest unmet need. Community-based studies would offer superior generalisability. The cross-sectional design precludes causal inference. Self-reported contraceptive practice data are susceptible to social desirability bias. Seasonal variation in OPD attendance during winter months (January–February) may have introduced marginal selection bias.

CONCLUSION

While contraceptive awareness is near-universal among rural women in Udham Singh Nagar, actual contraceptive use remains suboptimal (58.4%), driven by a profound and clinically significant KAP gap. Myths, fear of side effects, and lack of spousal support are the predominant barriers. Education and male partner involvement are the strongest modifiable determinants of use.

Targeted behaviour change communication (BCC), community-level counselling through ASHA networks, and systematic engagement of male partners are essential interventions to bridge this gap. Strengthening the spacing method mix—particularly IUCDs, injectables, and implants—within the public health delivery system is urgently needed. [24] Policymakers and programme managers in Uttarakhand should leverage this district-level evidence to design context-specific family planning interventions that respect women’s autonomy and reproductive rights. [28] Longitudinal community-based studies are recommended to validate these findings and assess the impact of proposed interventions.

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DECLARATIONS

Ethical Approval: Approved by IEC, RSSGMC, Rudrapur (IEC/RSSGMC/2025/118, dated 25 November 2025). Informed consent was obtained from all participants.

Conflict of Interest: None declared.

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Data Availability: Data are available from the corresponding author upon reasonable request.

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