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Original Article

Community Section

# Perception of Reproductive Health among School-going Adolescents: A Cross-sectional Study from the Field Practice Areas of a Medical College in Western Maharashtra, India

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## ABSTRACT

**Introduction:** Adolescent reproductive health awareness is critical for preventing Sexually Transmitted Infections (STIs), unintended pregnancies, and conditions affecting the reproductive tract. School-based reproductive health education though recognised as effective, remains marginal and socially constrained in India.

**Aim:** To assess the perception, knowledge, attitudes, and barriers related to reproductive health among school-going adolescents aged 14-19 years in the field practice areas of a Medical College in Pune, Western Maharashtra, India.

**Materials and Methods:** A cross-sectional study was conducted from January 2025 to February 2026 among 150 school-going adolescents (Classes X-XII). A self-structured questionnaire comprising 33 items across five domains was used. Data were analysed using Statistical Package for the Social Sciences (SPSS) version 20.0; descriptive and inferential statistics (Chi-square test) were applied. Statistical significance was set at p-value <0.05.

**Results:** The mean age was 15.8±1.1 years; 77 (51.4%) were female. While 147 (98.0%) identified basic reproductive organs correctly and 143 (95.3%) were aware of STIs, knowledge gaps were substantial: only 67 (44.7%) had contraceptive knowledge; 104 (69.3%) incorrectly believed fertilisation occurs in the uterus; and 66 (44.0%) attributed the determination of the baby's sex solely to the father. Cultural taboos were prevalent, with 41 (27.3%) holding menstrual impurity beliefs. Of 85 participants who reported barriers (56.7%), fear of being judged was the most common (30.6%). A statistically significant association was found between gender and the type of barrier faced ($\chi^2$ = 14.267, p-value=0.011). An overwhelming 146 (97.3%) agreed that reproductive health education should be made mandatory.

**Conclusion:** Substantial gaps exist in contraceptive awareness, STI literacy, and practical reproductive health knowledge. Structured, culturally sensitive, age-appropriate reproductive health education programmes are urgently needed within school curricula.


**Keywords:** Adolescent health, Attitudes, Contraception, Health knowledge, Practice, Public health, School health services, Sexually transmitted infections

## INTRODUCTION

Adolescence (10-19 years), as defined by the World Health Organisation (WHO), is a critical developmental phase characterised by substantial physical, psychological, and social transition [1]. During this period, adolescents face elevated risk for high-risk sexual behaviours, unintended pregnancies, and STIs, the consequences of which can be profound and lasting [2]. Globally, an estimated 21 million girls aged 15-19 become pregnant each year, with approximately half of these pregnancies unintended in low- and middle-income regions [3]. In India, adolescents constitute nearly 21% of the total population, and their Sexual and Reproductive Health (SRH) concerns impose a significant public health burden [4].

Reproductive health education is a recognised protective factor that equips adolescents with the knowledge, attitudes, and skills necessary for informed and responsible decision-making about their bodies and relationships [5]. The WHO and the United Nations Population Fund (UNFPA) both endorse Comprehensive Sexuality Education (CSE) as an evidence-based tool for preventing STIs and unintended pregnancies while promoting gender equity [6]. In India, however, sex education has been delivered sporadically and is largely shaped by cultural conservatism, leaving adolescents dependent on informal and potentially unreliable channels — chiefly peers and the internet [7].

National studies have documented highly variable reproductive health knowledge among Indian adolescents, with persistent misconceptions regarding menstruation, pubertal changes, contraception, and STIs [8,9]. National programmes such as the Rashtriya Kishor Swasthya Karyakram (RKSK) operate at scale but remain incompletely translated into local action, particularly in peri-urban settings around medical colleges [10]. Data from Western Maharashtra are scarce; most existing studies originate from southern or northern India [11,12], creating a geographic evidence gap. Few studies have concurrently assessed knowledge, attitudes, perceptions, and socio-cultural barriers within a single school-going cohort [13,14], limiting the design of locally relevant interventions.

Thus, the present study was undertaken with three objectives: i) to assess the level of knowledge regarding reproductive health, STIs, and contraception among school-going adolescents; ii) to evaluate perceptions, attitudes, and barriers towards reproductive health education; and iii) to explore gender-based differences in reproductive health knowledge and barriers. Ethics approval was obtained for a mixed-methods design encompassing quantitative and qualitative components; the qualitative component (focus group discussions) is being reported as a separate companion manuscript, with no data overlap between the two papers.

## MATERIALS AND METHODS

A cross-sectional study was conducted from January 2025 to February 2026 in the field practice areas of Dr. D. Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune, Western Maharashtra, India, encompassing secondary schools in urban and semiurban localities. Ethical clearance was obtained from the Institutional Ethics Sub-Committee (IESC) prior to commencement (Ref. No.: IESC/432/2024; Protocol No.: IESC/PGS/2024/215; date: 18/12/2024).

**Inclusion criteria:** All school-going adolescents aged 14-19 years enrolled in Classes X, XI, and XII who provided written informed assent and whose parents/guardians provided written informed consent were included in the study.

**Exclusion criteria:** Absentees on the day of data collection, participants unwilling to participate, and those outside the specified age and class range were excluded from the study. Participation was entirely voluntary, with freedom to withdraw at any time. Anonymity and confidentiality were strictly maintained.

**Sample size estimation:** The minimum sample size was estimated using $n = Z^2pq / d^2$, where Z = 1.96 (95% confidence level), p=0.62 (proportion with adequate reproductive health knowledge; Anilkumar A et al., 2022 [13]), q=0.38, and d=0.08 (allowable error). This yielded a minimum of 142, rounded to 150 for non response. Calculations were cross-verified using WinPepi v11.38.

**Sampling technique:** Six secondary schools in the designated field practice areas were approached. One school agreed to participate (school-level response rate 16.7%). All 150 participants were enrolled from this school, with proportional representation across Classes X, XI, and XII via simple random sampling.

**Data collection instrument:** A semistructured, self-administered questionnaire was developed de novo by the study team, guided by previously validated instruments [13-15] for adolescent SRH education [6]. It comprised 32 items across five domains: (a) socio-demographic characteristics; (b) knowledge of reproductive anatomy and puberty; (c) knowledge of pregnancy and fertilisation; (d) knowledge of STIs and contraception; and (e) perceptions, attitudes, and barriers towards reproductive health education. The questionnaire was available in English and Marathi. Content validity was assessed by a panel of three subject-matter experts (a gynaecologist, a community medicine specialist, and a medical educator). A pilot study among 15 adolescents (excluded from the main analysis) yielded a Cronbach's alpha of 0.78, indicating acceptable internal consistency.

Knowledge was assessed using 16 questions only- the rest 2 questions were not assessed. Each item was scored with one mark awarded for a correct response and zero for an incorrect or unsure response, yielding a possible total score ranging from 0 to 16. This scoring framework ensured that the knowledge assessment remained contextually and age-appropriate, reflecting only what participants could reasonably be expected to have encountered through formal education.

## STATISTICAL ANALYSIS

Data were entered in Microsoft Excel and analysed using SPSS version 20 (IBM Corp., Armonk, NY). Descriptive statistics (frequencies, percentages, mean±SD) were computed for all variables. Chi-square test was used for gender-based comparisons; Fisher's exact test was applied where expected cell frequencies fell below five. A knowledge score was calculated from 16 objective knowledge items (maximum score 16). The Bonferroni correction (adjusted $\alpha$=0.017) was applied only to the three a priori gender comparisons (menstrual impurity beliefs, contraceptive knowledge, peer-related barriers). Statistical significance was set at p-value <0.05 for all other comparisons.

## RESULTS

**Sociodemographic profile:** Of 160 students approached, 150 completed the questionnaire (response rate 93.75%). Age ranged from 14 to 19 years; the largest proportion {51 (34.0%)} were aged 15 years, and the mean age was 15.8±1.1 years. Of the participants, 77 (51.4%) were female, 72 (48.0%) were male, and 1 (0.6%) preferred not to disclose gender. Regarding class distribution, 83 (55.3%) were enrolled in Class X, 38 (25.3%) in Class XI, and 29 (19.3%) in Class XII [Table/Fig-1].

| Question/Response | n (%) |
|---|---|
| **Age group (years)** | |
| 14 | 16 (10.7) |
| 15 | 51 (34.0) |
| 16 | 43 (28.7) |
| 17 | 36 (24.0) |
| 18 | 3 (2.0) |
| 19 | 1 (0.7) |
| **Gender** | |
| Female | 77 (51.4) |
| Male | 72 (48.0) |
| Prefer not to disclose | 1 (0.6) |
| **Class/Grade** | |
| Class X | 83 (55.3) |
| Class XI | 38 (25.3) |
| Class XII | 29 (19.3) |

**[Table/Fig-1]:** Socio-demographic characteristics of study participants (n = 150).

**Knowledge of Reproductive Health, Puberty, STIs, and Contraception:** The findings reveal strong anatomical and basic reproductive knowledge among participants, with near-perfect scores on hormone identification, organ recognition, and the mechanics of fertilisation. However, significant gaps emerge in applied knowledge: 69% incorrectly believed fertilisation occurs in the uterus rather than the fallopian tube, and only 62.7% linked multiple sexual partners to STI risk. Cultural misconceptions persisted alongside curriculum knowledge, with 27.3% endorsing the belief that menstruating girls are impure, and only 44% of participants correctly attributed sex determination solely to the father, revealing a persistent misconception that may reinforce societal stigma and the unwarranted blame placed on mothers for the sex of the child.

Contraceptive knowledge was the weakest domain with fewer than half aware of contraceptives, yet over half correctly stating they prevent pregnancy, suggesting surface-level familiarity without deeper understanding. STI awareness was generally adequate but remained largely declarative, with prevention knowledge — particularly around condom use — lagging behind awareness. Overall, the results point to a pattern of strong definitional and anatomical knowledge alongside persistent factual errors and culturally rooted misconceptions in areas requiring applied or socially nuanced understanding [Table/Fig-2].

| Question/Response | n (%) |
|---|---|
| **Q1. Can identify basic reproductive organs of the human body** | |
| Yes | 147 (98.0) |
| No | 3 (2.0) |
| **Q2. Vagina is the reproductive organ of which gender?** | |
| Female | 149 (99.3) |
| Male | 1 (0.7) |
| **Q3. Testosterone is the hormone of which gender?** | |
| Male | 150 (100.0) |
| Female | 0 |
| **Q4. Pubertal changes in boys (beard, voice change, pubic hair) are abnormal** | |
| No — Normal physiological event | 105 (70.0) |

| | |
|---|---|
| Yes — Abnormal | 35 (23.3) |
| Not sure | 10 (6.7) |
| **Q5. Girls are dirty/impure during menstruation** | |
| Yes | 41 (27.3) |
| No | 109 (72.7) |
| **Q6. Females who reach menarche can become pregnant after physical relationship** | |
| Yes | 134 (89.3) |
| No | 16 (10.7) |
| **Q7. Fertilisation of the egg occurs in the uterus (True/False)** | |
| True | 104 (69.3) |
| False | 46 (30.7) |
| **Q8. Pregnancy is the result of fertilisation** | |
| True | 142 (94.7) |
| False | 8 (5.3) |
| **Q9. Can one get pregnant by kissing?** | |
| No | 138 (92) |
| Yes | 2 (1.3) |
| Not sure | 10 (6.7) |
| **Q10. For pregnancy to occur, ovum must be fertilised by sperm** | |
| Yes | 147 (98.0) |
| No | 3 (2.0) |
| **Q11. Who decides the biological sex of the baby?** | |
| The father | 66 (44.0) |
| Both equally | 41 (27.4) |
| God or Fate | 21 (14.0) |
| Not sure | 15 (10) |
| The mother | 7 (4.8) |
| **Q12. Aware of the term 'Sexually Transmitted Infections (STIs)'** | |
| Yes | 143 (95.3) |
| No | 7 (4.7) |
| **Q13. What are STIs? (Definition)** | |
| Diseases spread by sexual intercourse | 127 (84.7) |
| Diseases spread by kissing | 1 (0.7) |
| Diseases spread by touching | 0 |
| All of the above | 14 (9.3) |
| Not sure | 8 (5.3) |
| **Q14. Can spread of STDs/STIs be prevented?** | |
| Yes | 113 (75.4) |
| Not sure | 35 (23.4) |
| No | 2 (1.3) |
| **Q15. Multiple sexual partners increase risk of STIs** | |
| Yes | 94 (62.7) |
| Not sure | 39 (26.0) |
| No | 17 (11.4) |
| **Q16. Knowledge about contraceptives** | |
| Yes | 67 (44.7) |
| No | 83 (55.3) |
| **Q17. Contraceptives can prevent pregnancy** | |
| Yes | 83 (55.4) |
| Not sure | 58 (38.6) |
| No | 9 (6.0) |
| **Q18. Can STDs/STIs be prevented by use of condoms?** | |
| Yes | 101 (67.4) |
| No | 27 (17.9) |
| Not sure | 22 (14.7) |

**[Table/Fig-2]:** Knowledge responses to all reproductive health items (n=150).

### a. Open-ended item: Sexually transmitted diseases named by participants

Of 143 participants aware of the term STI, 111 provided responses to the open-ended question asking them to name specific STDs [Table/Fig-3]. HIV/AIDS was identified by 110 respondents (99.1%), reflecting the reach of public health campaigns. Awareness dropped sharply thereafter: Syphilis, Herpes, and Hepatitis were each named by only four respondents (3.6%), and HPV and Gonorrhoea by three each (2.7%). This steep attrition beyond HIV/AIDS signals a narrow, media-driven knowledge base.

| Question/Response | n (%) |
|---|---|
| HIV/AIDS | 110 (99.1) |
| Syphilis | 4 (3.6) |
| Herpes | 4 (3.6) |
| Hepatitis | 4 (3.6) |
| Human Papillomavirus (HPV) | 3 (2.7) |
| Gonorrhoea | 3 (2.7) |

**[Table/Fig-3]:** Sexually transmitted diseases named by participants (n = 111; multiple responses permitted).
*Percentages calculated among participants who responded to this open-ended item (n = 111); multiple responses were permitted; percentages do not sum to 100

### b. Open-ended item: Contraceptive methods named by participants

Among the 67 participants who reported contraceptive knowledge, all were asked to name the methods they knew [Table/Fig-4]. Condoms were the most recognised, named by 57 (85.1%), followed by contraceptive pills (31; 46.3%) and Copper-T (25; 37.3%). Permanent methods were poorly recognised: vasectomy and tubectomy were named by four participants each (6.0%) and the cervical cap by only 1 (1.5%). These findings confirm that awareness is heavily weighted towards barrier methods, reflecting the dominant narrative in public health messaging.

| Question/Response | n (%) |
|---|---|
| Condoms | 57 (85.1) |
| Contraceptive pills | 31 (46.3) |
| Copper-T (intrauterine device) | 25 (37.3) |
| Vasectomy | 4 (6.0) |
| Tubectomy | 4 (6.0) |
| Cervical cap | 1 (1.5) |

**[Table/Fig-4]:** Contraceptive methods named by participants (n = 67; multiple responses permitted).
*Percentages calculated among participants with contraceptive knowledge (n = 67); multiple responses were permitted; percentages do not sum to 100

**Sources of reproductive health information:** The internet was the primary source of reproductive health information for 51 (34.0%) participants, followed by school {40 (26.6%)}, friends {39 (26.0%)}, family/parents {11 (7.4%)}, and healthcare providers {9 (6.0%)} [Table/Fig-5]. The heavy dependence on internet and peer-based sources, and the near-absence of healthcare providers and family as primary channels, raises substantial concerns about information quality and the reinforcement of misconceptions.

| Question/Response | n (%) |
|---|---|
| Internet | 51 (34.0) |
| School | 40 (26.6) |
| Friends | 39 (26.0) |
| Family/parents | 11 (7.4) |
| Healthcare providers | 9 (6.0) |

**[Table/Fig-5]:** Primary sources of reproductive health information (n = 150).

**Perceptions, attitudes, and barriers towards reproductive health education:** [Table/Fig-6] presents the full distribution of responses to all perception, attitude, and barrier items. Regarding

the understanding of sex education, 77 (51.3%) correctly identified it as encompassing education about puberty, STDs, and reproductive health combined; 63 (42.0%) associated it with reproductive health alone. Almost all participants {146 (97.3%)} reported awareness of good touch and bad touch. School-based reproductive health education had been received by 129 (86.0%); 21 (14.0%) had not. Awareness of the term masturbation was reported by 105 (70.0%); opinion was divided, with 42 (27.8%) considering it normal and healthy, 37 (24.6%) wrong and harmful, and 71 (47.6%) unsure.

| Question/Response | n (%) |
|---|---|
| **Q19. Understanding of the term 'Sex Education'** | |
| Education about reproductive health only | 63 (42.0) |
| Education about puberty only | 3 (2.0) |
| Education about STDs only | 1 (0.7) |
| All of the above - puberty, STDs, and reproductive health | 77 (51.3) |
| Not sure | 6 (4.0) |
| **Q20. Have you received reproductive/sexual health education at school?** | |
| Yes | 129 (86.0) |
| No | 21 (14.0) |
| **Q21. Knowledge about 'good touch' and 'bad touch'** | |
| Yes | 146 (97.3) |
| No | 4 (2.7) |
| **Q22. Have you heard the term 'Masturbation'?** | |
| Yes | 105 (70.0) |
| No | 45 (30.0) |
| **Q23. In your opinion, masturbation is:** | |
| Normal and healthy | 42 (27.8) |
| Not sure | 71 (47.6) |
| Wrong and harmful | 37 (24.6) |
| **Q24. Faced barriers in accessing sexual health information** | |
| Yes | 85 (56.7) |
| No | 65 (43.3) |
| **Q25. Societal/peer pressure hinders open discussion about sexual health** | |
| Yes | 91 (60.7) |
| No | 59 (39.3) |
| **Q26. How can schools/communities reduce societal stigma around sexual health?** | |
| By conducting seminars | 64 (42.5) |
| Conducting activities on reproductive/sexual health awareness | 53 (35.3) |
| Being more vocal about the topic | 33 (22.2) |
| **Q27. Come across sexual health-related content on social media** | |
| Yes | 84 (56.0) |
| No | 66 (44.0) |
| **Q28. Social media influences thought process related to sexual health** | |
| Yes | 85 (56.7) |
| No | 61 (40.7) |
| Not sure | 4 (2.6) |
| **Q29. Sexual/reproductive health education should be made mandatory** | |
| Yes | 146 (97.3) |
| No | 4 (2.7) |

**[Table/Fig-6]:** Perceptions, attitudes, and barriers towards reproductive health education (n = 150).

Social media exposure to sexual health content was reported by 84 (56.0%) participants. Social media was perceived to influence sexual health thinking by 85 (56.7%). Peer or societal pressure was identified as a barrier to open discussion by 91 (60.7%). On preferred approaches to reducing stigma, 64 (42.5%) endorsed school seminars, 53 (35.3%) preferred awareness activities, and 33 (22.2%) supported being more vocal. An overwhelming 146 (97.3%) agreed that reproductive and sexual health education should be made mandatory.

**Nature of barriers to sexual health information access:** Of 150 participants, 85 (56.7%) reported facing barriers in accessing sexual health information. Among these 85, the two most frequently cited barriers were fear of being judged reported by 26 (30.6%), and personal comfort, reported by 25 (29.4%) participants followed by cultural taboos {17 (20%)}, social stigma {8 (9.4%)}, lack of comprehensive education {5 (5.9%)}, and limited access to healthcare {4 (4.7%)} [Table/Fig-7].

| Question/Response | n (%) |
|---|---|
| Fear of being judged | 26 (30.6) |
| Personal comfort | 25 (29.4) |
| Cultural taboos | 17 (20.0) |
| Social stigma | 8 (9.4) |
| Lack of comprehensive education | 5 (5.9) |
| Limited access to healthcare | 4 (4.7) |
| Total | 85 (100.0) |

**[Table/Fig-7]:** Barriers to sexual health information access among participants who reported barriers (n=85).

**Association between gender and barriers faced:** A statistically significant association was observed between gender and the type of barrier encountered in accessing sexual health information ($\chi^2$=14.267, df=5, p-value=0.011) [Table/Fig-8]. Among 43 females who reported barriers, fear of being judged was the most common (37.2%), followed by personal comfort (32.6%) and cultural taboos (23.3%). Among 42 male participants who reported barriers, personal comfort was the leading concern (26.2%), followed by fear of being judged (23.8%). Social stigma was far more prevalent among males (16.7%) than females (2.3%), and limited access to healthcare was reported exclusively by males (9.5%). These gender-differential patterns indicate the need for sex-disaggregated programme design.

| Barrier | Females n (%) | Males n (%) | $\chi^2$ (df) | Significance |
|---|---|---|---|---|
| Cultural taboos | 10 (23.3) | 7 (16.7) | 14.267 (5) | p-value= 0.011 |
| Fear of being judged | 16 (37.2) | 10 (23.8) | | |
| Lack of comprehensive education | 2 (4.7) | 3 (7.1) | | |
| Limited access to healthcare | 0 | 4 (9.5) | | |
| Personal comfort | 14 (32.6) | 11 (26.2) | | |
| Social stigma | 1 (2.3) | 7 (16.7) | | |
| Total | 43 (100) | 42 (100) | | |

**[Table/Fig-8]:** Gender-stratified distribution of barriers to accessing sexual health information (n = 85).
Chi-square test applied; p<0.05 indicates statistical significance. The overall chi-square statistic applies to the full 2 × 6 contingency table.

**Gender-based differences in knowledge and knowledge scores:** Gender-based comparisons of knowledge were conducted among 149 participants (excluding one who preferred not to disclose gender). Three items were selected a priori based on documented gender differences in Indian adolescent reproductive health literature: menstrual impurity beliefs, contraceptive knowledge, and peer-related barriers to discussion. A Bonferroni-corrected significance threshold of p-value <0.017 was applied.

Menstrual impurity beliefs were significantly more prevalent among female participants {28/77 (36.4%)} than among males {13/72 (18.1%)} ($\chi^2$=6.253, df=1, p-value=0.012). Knowledge of contraceptives was significantly higher among males {40/72 (55.6%)} than females {27/77 (35.1%)} ($\chi^2$=6.313, df=1, p-value=0.012). Peer pressure as a barrier to discussion was reported more commonly by females {52/77 (67.5%)} than males {39/72 (54.2%)}, though

this fell short of the Bonferroni-corrected threshold ($\chi^2$=2.796, df=1, p-value=0.095).

Overall knowledge scores are presented in [Table/Fig-9]. The mean knowledge score was 12.2±2.1 out of a maximum of 16. Female participants scored significantly higher (mean 13.01±1.58) than males (11.63±2.36), consistent with a Mann-Whitney U value of 5.376 (p-value <0.001).

| Statistic | Value |
|---|---|
| Mean±SD | 12.2±2.1 |
| Median | 13.0 |
| Minimum – Maximum | 6 – 16 |
| Female Mean±SD | 13.01±1.58 |
| Male Mean±SD | 11.63±2.36 |
| Mann-Whitney U value | 5.376 |
| p-value | <0.001 |

**[Table/Fig-9]:** Knowledge score distribution of study participants (n = 150). Knowledge score calculated from 16 objective knowledge items (maximum score = 16). Mann-Whitney U test applied for gender comparison.

## DISCUSSION

This study assessed the knowledge, attitudes, perceptions, and barriers regarding reproductive health among adolescents in schools in Pune, Western Maharashtra, India. The findings reveal a pattern consistent with the broader Indian literature [8,9,13,15]: near-adequate basic anatomical knowledge co-existing with substantial gaps in applied reproductive health literacy, reinforced by persistent cultural taboos and structural barriers to credible information.

Near-universal awareness of basic reproductive anatomy {147 (98.0%)} was reassuring and likely reflects exposure to the school biology curriculum. This was consistent with Siva VK et al., who documented comparable rates (96.0%) among urban school-going adolescents in Chennai [15]. However, anatomical familiarity does not translate into functional reproductive health literacy, as evidenced by the misconceptions identified in this study.

The finding that 104 (69.3%) participants incorrectly believed fertilisation occurs in the uterus is a significant knowledge gap not highlighted in many prior studies. This misconception, while seemingly esoteric, has direct implications for understanding ectopic pregnancy risk and for contraceptive counselling. The persistence of this error despite biology curriculum coverage warrants dedicated attention in educational programme design.

The finding that 27.3% of adolescents endorsed menstrual impurity beliefs is concerning. Such taboos are well documented in India and associated with school absenteeism, poor menstrual hygiene, and psychological distress [16]. Mukherjee D et al., similarly documented widespread menstrual misconceptions among Delhi-NCR adolescents [17]. The persistence of these beliefs despite formal science education suggests that factual instruction alone is insufficient; culturally sensitive and interactive pedagogical approaches are required to challenge deeply held norms.

The gap in contraceptive knowledge i.e., only 44.7% aware of contraceptives and 38.6% uncertain whether they prevent pregnancy is particularly concerning for a population at risk of unintended pregnancy. This likely reflects the deliberate exclusion of contraception from school curricula in India, driven by cultural and political sensitivities. Alekhya G et al., demonstrated that structured school-based interventions can raise contraceptive awareness from approximately 11% to above 87% in an Odisha-based cluster randomised trial [18], underscoring the modifiability of these gaps. The apparent inconsistency — 55.3% unaware of contraceptives yet 55.4% affirming that they prevent pregnancy — reflects surface familiarity without definitional clarity, illustrating the depth of the knowledge gap.

That 44.0% of participants attributed the sex of the baby solely to the father reveals a critical misconception about genetics. In the Indian cultural context, this belief is directly linked to son preference, gender-based discrimination, and the social penalisation of mothers for the sex of their offspring. Educational programmes must address this explicitly.

The predominance of the internet (34.0%) over school (26.6%), family (7.4%), and healthcare providers (6.0%) as an information source reflects a global trend and raises concerns about misinformation [19]. The near-absence of healthcare providers as sources represents a missed opportunity. Integrating brief reproductive health counselling into adolescent clinical encounters, as recommended by Khubchandani J et al., would partially address this gap [20].

High rates of perceived barriers (56.7%) and peer-related inhibition of open discussion (60.7%) align with prior Indian evidence on sociocultural barriers to SRH education [21]. Fear of being judged and personal comfort were the two most prevalent barriers overall. The statistically significant gender difference in barrier profiles ($\chi^2$=14.267, p-value=0.011); with females more likely to cite fear of judgment and males more likely to cite social stigma and limited healthcare access- has direct implications for gender-responsive programme design. Programmes that engage peer educators and community leaders, beyond classroom teachers, are more likely to dismantle these barriers effectively.

The near-unanimous endorsement of mandatory reproductive health education (97.3%) demonstrates strong demand from the intended beneficiaries themselves. This finding should serve as a compelling evidence point for policymakers. The findings align with the WHO's global standards for sexuality education and National Education Policy (NEP) 2020's vision for health and wellbeing integration [22]. Policy recommendations arising from this study include: i) mandating age-appropriate, comprehensive SRH education as a core curricular component; ii) training teachers in evidence-based, culturally sensitive SRH pedagogy; iii) establishing school-linked adolescent health services for confidential counselling; and iv) engaging parents and community leaders to create enabling social environments for open discussion.

### Limitation(s)

Several limitations must be acknowledged. First, the cross-sectional design precludes causal inferences. Second, though six schools were approached, only one agreed to participate, limiting representativeness and generalisability. Third, self-reported data are susceptible to social desirability bias, particularly for sensitive topics. Fourth, multivariate analyses to identify independent predictors of knowledge were beyond the scope of this study. Fifth, the absence of stratification across multiple schools means school-level contextual factors cannot be disentangled from individual-level findings. Future studies should employ multi-school, multi-site sampling with validated psychometric instruments and longitudinal designs.

## CONCLUSION(S)

The study revealed that while basic reproductive anatomy was well understood, substantial gaps persisted in knowledge of fertilisation, contraception, STI prevention, and the biological determination of sex. Cultural taboos continued to inhibit open discussion; fear of being judged and personal comfort were the principal barriers, with significant gender differences in barrier profiles. Informal sources - chiefly the internet, dominated information-seeking behaviour. The near-unanimous demand for mandatory reproductive health education underscores adolescent readiness for comprehensive SRH curricula. Coordinated action by policymakers, school administrators, healthcare providers, and community leaders is essential to implement evidence-based, culturally sensitive, age-appropriate reproductive health education within school systems, with explicit attention to gender equity and the dismantling of persistent cultural misconceptions.

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