ORIGINAL RESEARCH ARTICLE

Knowledge of HIV/AIDS and Perceived Contraceptive Access among Indian Adolescents: Evidence from UDAYA Data

S Prinitha[1], Tony P Jose[2*]

[1,2]School of Social Sciences and Languages, Vellore Institute of Technology, Vellore, India

DOI: 10.55489/njcm.160620255348

ABSTRACT

Background: Access to contraceptive methods among adolescents is a critical factor in improving sexual and reproductive health outcomes. The study investigated the determinants of perceived contraceptive access among Indian adolescents by exploring role of HIV/AIDS knowledge, condom awareness, health facility accessibility, and socio-demographic variables, while analysing gender differences.

Methodology: Data from Understanding the Lives of Adolescents and Young Adults (UDAYA) – Wave 2 (2018-19) included 2,716 adolescent boys and 10,425 adolescent girls, both aged 15–19 years. Descriptive analysis, Chi-square test and multivariate logistic regression were employed.

Results: Significant gender disparities exist across all variables ($p<0.001$), particularly in health facility accessibility ($\chi^2=2200$), condom awareness and HIV/AIDS knowledge, and perceived contraceptive access. Multivariate analysis revealed condom awareness most strongly associated with perceived contraceptive access for both boys (OR=2.69, 95%CI:2.07-3.50) and girls (OR=1.45, 95%CI:1.32-1.60). HIV/AIDS knowledge and health facility access also significantly increased perceived contraceptive access odds in both groups. Socioeconomic factors played a crucial role in determining perceived contraceptive access.

Conclusion: Enhancing adolescents perceived contraceptive access requires improving HIV/AIDS knowledge, condom awareness, and healthcare accessibility. Especially for teenagers from different socioeconomic strata, policy interventions need to focus on removing barriers to healthcare access.

Keywords: Adolescents, Perceived Contraceptive Access, Sexual Health, HIV/AIDS knowledge, Condom Awareness

ARTICLE INFO

Financial Support: None

Conflict of Interest: The authors have declared that no conflicts of interest exist.

Received: 18-03-2025, **Accepted**: 24-04-2025, **Published**: 01-06-2025

***Correspondence:** Dr. Tony P Jose (Email: tony.jose@vit.ac.in)

How to cite this article: S Prinitha, Jose TP. Knowledge of HIV/AIDS and Perceived Contraceptive Access among Indian Adolescents: Evidence from UDAYA Data. Natl J Community Med 2025;16(6):562-571. DOI: 10.55489/njcm.160620255348

www.njcmindia.com | pISSN: 0976-3325 | eISSN: 2229-6816 | Published by Medsci Publications

INTRODUCTION

Adolescence is a pivotal point of developmental process marked by critical development in physical, psychological and social aspects.[1,2] Adolescents are exposed to arenas of experiences which includes involving in romantic relationships and experimenting with sexual behaviours.[2] The dynamic nature of cognitive and emotional development of adolescents emphasizes the need for tailored healthcare services that cater to the individual needs and promotes positive health behaviour.[3,4] Adolescents, particularly from low- and middle-income countries, are vulnerable due to the limited access to information and health services.[5]

Reproductive health is instrumental in well-being of adolescents.[6] This can be achieved by ensuring adolescents have access to resources and knowledge related to sexually transmitted diseases and unintended pregnancies.[7,8] Stigma and inadequate access to healthcare infrastructure serves as an impediment to sexual health of adolescents.[9] All these barriers could be addressed by identifying factors that influence the access to contraceptive methods.[10]

HIV knowledge plays a vital role in comprehensive understanding of preventive sexual health behaviour.[11] HIV knowledge can impact the decision-making process related to sexual protection.[11] Research highlights that individuals with higher levels of HIV knowledge tend to engage in consistent condom use.[12]

Condom awareness is associated with heightened awareness of HIV and other sexually transmitted diseases and accurate perception of the efficacy of condoms.[13] Condom users were inclined to have a positive attitude towards condoms, have social support for condom use and more confident in the ability to use condoms.[14] Condom use decision-making was influenced by fear of unintended pregnancy, sexually transmitted diseases and lack of instability in the lives of adolescents.[15]

Access to health facilities is a determinant of contraceptive buying behaviour.[16] Studies suggest that individual's ability to access health facilities impacts contraceptive purchase, receiving counselling related to sexual health outcomes, and receiving comprehensive information regarding sexual protection.[17,18] Geographical barriers have also been identified as a hurdle limiting an individual's access to sexual health services and thereby contraceptive purchasing patterns.[19] Researches have indicated that limited accessibility to health facilities creates a significant impact on sexual health, compromising preventive strategies at individual and community level.[20]

The contraceptive buying behaviour is the outcome of the interplay of individual, social, and structural factors.[21] Ajzen's Theory of Planned Behaviour (TPB) provides a basis for understanding of human behaviour. The fundamental assumption of this theory is based on an individual's intention, which is shaped by attitudes and subjective norms. Behavioural beliefs and normative beliefs are rooted in underlying beliefs.[22] The extended model introduces an additional component, namely perceived behaviour control. Perceived behaviour control is the individual's sense of ability to perform a specific behavior.[23,24] TPB considers knowledge as a precursor to attitude. The underlying mechanism of how knowledge influences attitude and behaviour is ambiguous.[25] The ambiguity presents a challenge for researchers in understanding the interplay among knowledge, attitudes, and behavioural intentions. The research focuses on studying the relationship between knowledge and perceived contraceptive access. Within the TPB model, the measure of perception in contraceptive accessibility aligns with perceived behaviour control component.[25] Perceived contraceptive access deals not only with internal aspects like confidence and knowledge, but also social acceptance-factor in influencing the possibilities of contraceptive acquisition and utilisation. While the current study focuses on perception in contraceptive accessibility rather than attitude towards contraceptive use, TPB provides a framework for understanding the influence of behavioural intentions and thereby its subsequent contraceptive behaviours.

Despite extensive research on contraceptive behaviour, a significant gap exists in understanding the adolescents' perception towards contraceptive access. Existing literature has primarily focussed on the relationship between knowledge of HIV/AIDS and contraceptive use, rather than perceived access. The current study examines the knowledge of HIV/AIDS and contraceptive awareness in relation to adolescents' perception of contraceptive accessibility. The study also investigates gender differences in perception of contraceptive accessibility among adolescents. This distinction is important as perceived access represents a critical intermediate step between knowledge acquisition and actual preventive behavior. This research can highlight the gap between awareness and perceived capability to access contraceptives, a critical yet understudied component in the pathway to HIV prevention.

METHODOLOGY

Data: The current cross-sectional study derived data from the "Understanding the Lives of Adolescents and Young Adults (UDAYA)" survey, which is conducted by the Population Council of India. UDAYA is a longitudinal survey that provides comprehensive insights of transitioning of adolescence to young adulthood. The data consists of adolescent boys and girls who are between the ages of 10-19 years from the states of Bihar and Uttar Pradesh in India.[26]

The UDAYA data employed a systematic, multi-stage stratified sampling design to independently select sample areas for the study.[26] The sampling frame for

the study was based on the 2011 Census list containing the list of villages and wards. In each state of Bihar and Uttar Pradesh, 150 primary sampling units were chosen. Within each primary sampling unit, the households chosen for the interview were selected using the systematic sampling technique. Households were systematically sampled with equal probability, and a single respondent per category within each household was selected for the interview. This resulted in three interviews from each household. The categories covered were one female from early adolescence, one unmarried female and one married female from later adolescents and one male from early adolescence, one unmarried male, and one married male from later adolescents. If a household contained more than one respondent within a single category, one respondent was randomly selected using the Kish table, with no replacements allowed.[26]

The first round of the UDAYA survey was conducted between 2015 and 2016 and included 20,594 adolescents (5,969 boys and 14,625 girls).[26] In the follow-up survey, conducted between 2018 and 2019, 4,567 boys and 12,251 girls who were interviewed in the first wave and consented to a re-interview were successfully re-interviewed. Boys had a follow-up rate of 74% and girls had a follow-up rate of 81%. Participants who reported inconsistent responses on age or education were excluded (3%). This follow-up survey resulted in the final sample size of 11,864 girls and 4,428 boys.[26] The present study has an effective sample size of 2,716 adolescent boys and 10,425 adolescent girls, both aged 15–19 years during wave 1, who were 18-22 years during wave 2. All participants in both survey waves provided written consent.

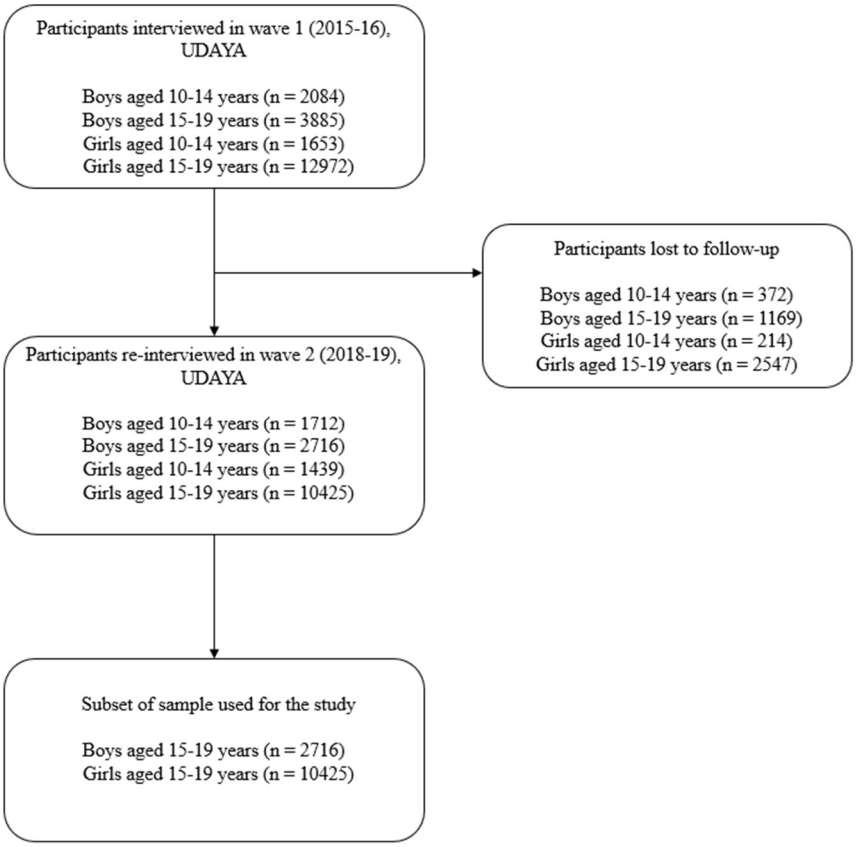

Figure 1: Sample selection criteria

Measures

Predictor variables: Knowledge of HIV/ AIDS was assessed using the following questions: "(1) Can people get the AIDS virus from mosquito bites? (2) Can people get the AIDS virus by sharing food with a person who has AIDS? (3) Can people get the AIDS virus by hugging someone who has AIDS? (4) Can you tell by looking at a person whether s/he has HIV? (5) Can people reduce their chances of getting the AIDS virus by having just one sex partner? (6) Can people reduce their chances of getting the AIDS virus by using a condom every time they have sex?" Participants who had responded correctly to all six questions were considered to have sufficient knowledge of HIV/AIDS else considered to have insufficient knowledge of HIV/AIDS.[26]

Awareness of condom was assessed using the question, "One condom can be used for how many acts of sexual intercourse?" [26] Participants who had responded correctly were considered to have sufficient knowledge of condom else considered insufficient knowledge of condom.

Accessibility to health facility was assessed using the following questions: "Are you usually allowed to go alone to a health facility? If no, are you allowed to go only with someone else?"[26] Participants who have responded that they are allowed to go alone or allowed to go with someone were considered to have accessibility to health facility and participants who responded not at all were considered not to have accessibility to health facility.

Outcome variable: Perceived contraceptive access was assessed using the questions: "(1) How confident are you that you can obtain information about contraceptive methods from an ASHA, ANM, or a doctor? (2) How comfortable are you to buy a contraceptive method from a medical store or any other shop? (3) How comfortable are you to approach a health care provider like ASHA, ANM, or doctor to obtain a contraceptive method?"[26] Participants who have responded very comfortable and comfortable to all three questions were considered to be comfortable in accessing contraceptive methods and participants who have responded not sure, not comfortable, not at all comfortable, won't need contraceptives, and no response were considered to be uncomfortable in accessing contraceptive methods.

Explanatory variable: The current study considered various socio-economic and demographic variables. The variables consist of age (15, 16, 17, 18, 19), religion (Hindu, Muslims, and Others), Years of schooling (no schooling, 1-5 years of schooling, 6-10 years of schooling and 11 & above of schooling). The household economic status was assessed using a self-report question: "How would you describe the economic status of the household in which you are currently living? Would you say very rich, rich, comfortable or poor? By comfortable, I mean we can manage our basic necessities but not enough for anything else and by poor, I mean we never have enough to eat and sometimes have to skip meals"[26]. The question provided four options which are very rich, rich, comfortable but no money for anything aside from necessities and poor/struggle never enough to eat, and sometimes have to skip meals. The question assesses current economic status relative to the past three years, thereby capturing the subjective assessment of current financial situation in the households. In addition, residence type (urban or rural), and place of residence (Uttar Pradesh or Bihar).

Statistical analysis: Descriptive statistics, Chi-square test and multivariate logistic regression are used to understand the background characteristics of the sample. The multivariate logistic regression is presented using Odds Ratio (OR) with a 95% confidence level. Odds ratio was employed to ascertain the likelihood of the odds of individuals feeling comfortable versus uncomfortable in accessing the contraceptives. STATA 14.2 was used in conducting the statistical analysis.

Approval of Institutional Ethical Review Board: The data is available at public domain. Hence, no ethical clearance is required. The ethical review board of Population Council of India, New Delhi has given ethical approval for the UDAYA survey.

Results

Knowledge of HIV/AIDS, awareness of condoms, access to health facilities, and perceived contraceptive access among adolescent boys and girls are presented in Fig. 2, Fig. 3, Fig. 4, and Fig. 5. Among adolescent boys, 23.99% have knowledge of HIV/AIDS, 86.12% are aware of condoms, 90.49% have access to health facilities, and 45.79% feel comfortable obtaining contraceptives. Among adolescent girls, 10.1% have knowledge of HIV/AIDS, 51.24% are aware of condoms, 35.88% have access to health facilities, and 38.42% feel comfortable obtaining contraceptives.

The sociodemographic attributes of the study participants are presented in Table 1. In the context of adolescent boys, the study participants consisted of 15 years (24.92%), 16 years (23.26%), 17 years (20.35%), followed by 18 years (19.17%) and 19 years (12.30%). Further, the majority of the boys belonged to Hindu religion (84.95%), followed by Muslim (14.64) and boys belonging to other categories of religion (0.4%). Notably, the majority of the boys have 11 and above years of schooling (61.37%), followed by 6-10 years of schooling (31.80%), 1-5 years of schooling (5.74%), and didn't complete schooling (1.09%). In terms of household economic status, the majority of the participants reported that they are comfortable but have no money for anything aside from necessities (84.79%), rich (7.56%), followed by poor (7.52%) and very rich (0.12%). The majority of the participants are living in urban (51.05%), followed by participants living in rural (48.95%). In terms of state, the majority of the participants are from Uttar Pradesh (53.24%) and followed by Bihar (46.76%).

Among adolescent girls, the study participants consisted of 19 years (25.03%), 18 years (25.06%), 17 years (18.97%), followed by 16 years (16.49%) and 15 years (14.45%). It is noted that the majority of the girls belonged to Hindu religion (80.63%), followed by Muslim girls (19.06%) and girls belonging to other categories of religion (0.3%). In terms of years of schooling, it is found that the majority of the girls have completed 11 and above (48.79%), 6-10 years (37.39%), followed by 1-5 years (10.32%) and not completed schooling (3.50%). In terms of household economic status, the majority of the girls reported that they were comfortable but no money for anything aside from necessities (70.98%), rich (23.76%), followed by poor (4.46%) and very rich (0.8%). The Majority of the participants are from rural (56.65%) and followed by participants from urban (43.35%). It is also noted that the majority of the participants belong to the state of Bihar (51.93%) and followed by Uttar Pradesh (48.07%).

Chi-square tests were conduct to examine gender dif

ference in knowledge of HIV/AIDS, awareness of condom, accessibility to health facility, and perceived contraceptive access. Results are presented in table 2. Strong association was observed between accessibility to health facility and gender ($\chi^2(1) = 2200$, $p<0.001$), followed by condom awareness ($\chi^2(1) = 944.60$, $p<0.001$), HIV/AIDS knowledge ($\chi^2(1) = 308.20$, $p<0.001$), and perceived contraceptive access ($\chi^2(1) = 42.21$, $p<0.001$). The results reveal substantial gender disparities pertaining to sexual health knowledge.

A multivariate logistic regression was conducted associating perceived contraceptive access with knowledge of HIV/AIDS, condom awareness, access to health facility and socio-demographic variables. The results are presented in table 3. Knowledge of HIV/AIDS is significantly associated with perceived contraceptive access, with both adolescent boys (OR: 1.31, 95% CI: 1.07-1.59) and girls (OR: 1.24, 95% CI: 1.05-1.45) showing higher odds compared to those without HIV/AIDS knowledge.

Access to health facilities demonstrated substantial impact, where adolescents with mobility to health facilities showed significantly higher odds, with boys (OR: 1.44, 95% CI: 1.07-1.94) and girls (OR: 1.62, 95% CI: 1.46-1.80) compared to those without such access. Notably, awareness of condoms emerged as one of the strongest factors associated with perceived contraceptive access, with boys showing particularly high odds (OR: 2.69, 95% CI: 2.07-3.50) and girls also demonstrating significant association (OR: 1.45, 95% CI: 1.32-1.60).

A gradient effect was observed in the analysis of age, particularly among older adolescents. It was found that significant associations were observed among 18-year-olds, with boys (OR: 1.28, 95% CI: 1.00-1.65); girls (OR: 1.29, 95% CI: 1.10-1.51) and 19-year-olds, with boys (OR: 1.58, 95% CI: 1.18-2.11); girls (OR: 1.35, 95% CI: 1.15-1.59).

Religious affiliation showed varied effects, with adolescents from other religions demonstrating notably

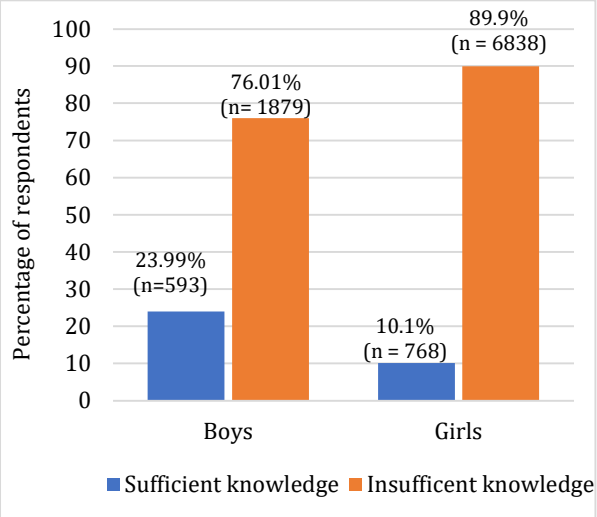

Figure 2: Knowledge of HIV/AIDS among adolescents

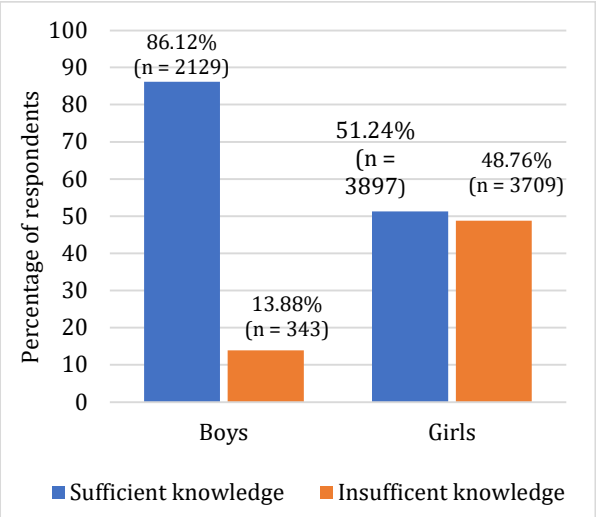

Figure 3: Awareness of condom among adolescents

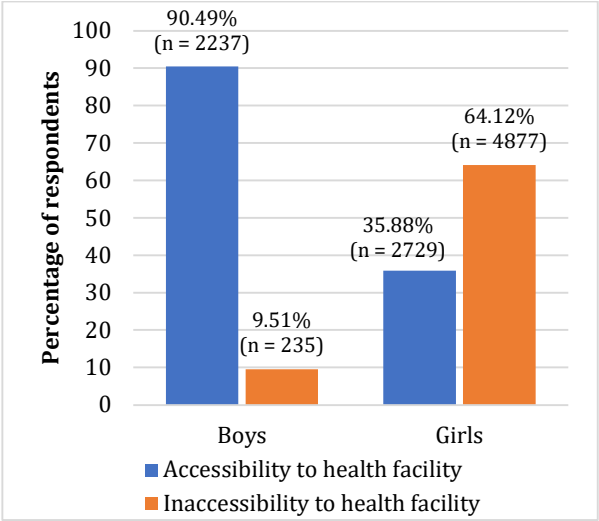

Figure 4: Access to health facility among adolescents

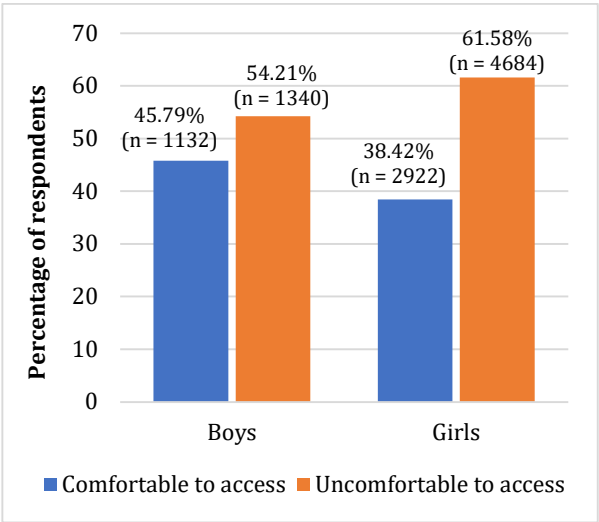

Figure 5: Perceived contraceptive access among adolescents

Table 1: Socio-economic attributes of study population, 2018-2019

Variables	Adolescent boys(%)	Adolescent girls(%)
Age		
15	616 (24.92)	1099 (14.45)
16	575 (23.26)	1254 (16.49)
17	503 (20.35)	1443 (18.97)
18	474 (19.17)	1906 (25.06)
19	304 (12.3)	1904 (25.03)
Religion		
Hindu	2100 (84.95)	6133 (80.63)
Muslim	362 (14.64)	1450 (19.06)
Others	10 (0.4)	23 (0.3)
Years of schooling		
Not completed	27 (1.09)	266 (3.5)
1-5	142 (5.74)	785 (10.32)
6-10	786 (31.8)	2844 (37.39)
11 & above	1517 (61.37)	3711 (48.79)
Household economic status		
Very Rich	3 (0.12)	61 (0.8)
Rich	187 (7.56)	1807 (23.76)
Comfortable but no money for anything aside from necessities	2096 (84.79)	5399 (70.98)
Poor/struggle never enough to eat, and sometimes have to skip meals	186 (7.52)	339 (4.46)
Current place of residence		
Urban	1262 (51.05)	3297 (43.35)
Rural	1210 (48.95)	4309 (56.65)
State		
Uttar Pradesh	1316 (53.24)	3656 (48.07)
Bihar	1156 (46.76)	3950 (51.93)

Table 2: Chi-square test of gender differences in Knowledge of HIV/AIDS, Awareness of Condom, Accessibility to Health Facility, and Perceived Contraceptive Access

Variable	Male (n)	Female (n)	χ^2(df)	p-value
Knowledge of HIV/AIDS				
Sufficient knowledge	593	768	308.20 (1)	p<0.001
Insufficient knowledge	1879	6838		
Awareness of condom				
Sufficient knowledge	2129	3897	944.60 (1)	p<0.001
Insufficient knowledge	343	3709		
Accessibility to health facility				
Accessibility to health facility	2237	2729	2200 (1)	p<0.001
Inaccessibility to health facility	235	4877		
Perceived contraceptive access				
Comfortable to access	1132	2922	42.21 (1)	p<0.001
Uncomfortable to access	1340	4684		

higher odds among girls (OR: 3.15, 95% CI: 1.30-7.60) compared to Hindu adolescents, while Muslim adolescents showed no significant difference from the reference category.

There were no significant association found between the number of years spent in school and perceived contraceptive access any of the four categories for either gender. when compared to those who had not completed schooling. Similarly, household economic status did not emerge as statistically significant in association with perceived contraceptive access across categories for either gender.

Geographic factors demonstrated significant associations. Rural residence was associated with higher odds for both boys (OR: 1.40, 95% CI: 1.18-1.66) and girls (OR: 1.34, 95% CI: 1.21-1.48) compared to urban residents. State-wise analysis revealed that girls from Bihar had significantly higher odds (OR: 1.61, 95% CI: 1.46-1.77) in comparison to those from Uttar Pradesh, while no significant state-wise difference was observed among boys.

DISCUSSION

This study aimed to examine the determinants of perceived contraceptive access among adolescents and particularly attempted to interpret gender disparities in knowledge of HIV, awareness about condom and accessibility to health facility. The findings of the study reveal that adolescent boys exhibited a greater awareness of HIV compared to adolescent girls. It demonstrates consistency with previous findings where it was found that adolescent males from low-and middle-income countries have higher knowledge in HIV transmission, prevention, attitudes, and sexual decision-making.[27] The study found

Table 3: Multivariate logistic regression associating Perceived contraceptive access with Knowledge of HIV/AIDS, Condom Awareness, Access to Health Facility and Socio-demographic variables

Variables	Adolescent boys Odds ratio (CI)	Adolescent girls Odds ratio (CI)
Knowledge of HIV/ AIDS		
Insufficient knowledge (ref)		
Sufficient knowledge	1.31** (1.07,1.59)	1.24** (1.05, 1.45)
Awareness of condom		
Insufficient knowledge (ref)		
Sufficient knowledge	2.69** (2.07, 3.50)	1.45** (1.32, 1.60)
Access to health facility		
Inaccessibility to health facility (ref)		
Accessibility to health facility	1.44* (1.07,1.94)	1.62** (1.46, 1.80)
Age		
15 (ref)		
16	0.87 (0.69, 1.11)	1.00 (0.84, 1.19)
17	0.98 (0.77, 1.26)	1.13 (0.95, 1.34)
18	1.28* (1.00, 1.65)	1.29** (1.10, 1.51)
19	1.58** (1.18, 2.11)	1.35** (1.15, 1.59)
Religion		
Hindu (ref)		
Muslim	0.84 (0.66, 1.07)	0.90 (0.79, 1.02)
Others	3.32 (0.79, 13.90)	3.15* (1.30, 7.60)
Years of schooling		
Not completed (ref)		
1 - 5	1.54 (0.63, 3.78)	0.99 (0.74, 1.34)
6 - 10	1.16 (0.49, 2.70)	1.25 (0.95, 1.64)
11 & above	1.26 (0.54, 2.94)	1.22 (0.93, 1.61)
Household economic status		
Very Rich (ref)		
Rich	2.46 (0.21, 27.92)	1.21 (0.70, 2.07)
Comfortable but no money for anything aside from necessities	1.91 (0.17, 21.29)	1.17 (0.68, 1.99)
Poor/struggle never enough to eat, and sometimes have to skip meals	1.18 (0.104, 13.49)	1.09 (0.61, 1.96)
Current place of residence		
Urban (ref)		
Rural	1.40** (1.18, 1.66)	1.34** (1.21, 1.48)
State		
Uttar Pradesh (ref)		
Bihar	1.03 (0.87, 1.22)	1.61** (1.46, 1.77)

*If p<0.05 **if p<0.01; *CI* confidence interval; *ref* reference

that awareness about condom was higher among adolescent boys than adolescent girls. A study conducted with African adolescents revealed that awareness of condoms was greater among both male and female participants.[28]

The study's results revealed that adolescent boys have greater accessibility to health facilities than adolescent girls. A study on African adolescents assessing barriers to accessing and utilizing adolescent health services found that lack of parental support as a primary obstacle to accessing health services.[29] The current investigation revealed that adolescent males exhibited a higher propensity to acquire contraceptives compared to their female counterparts. Despite having adequate knowledge on sexual and reproductive health, adolescents are unable to obtain contraceptives when needed.[30] A study among Indian adolescent girls has found the raising role of media in enhancing knowledge, shaping attitudes, and influencing behaviors related to sexual and reproductive health.[31] This gender disparity aligns with findings from various studies in developing nations, which attribute it to deeply rooted social and cultural norms that impede utilization of sexual and reproductive health information.[32–34] According to the TPB, the discrepancy between knowledge and action results from the influence of perceived behavioural control and subjective norms rather than attitude alone, highlighting the underlying role of behavioural intentions.

The interaction between understanding HIV and the perception of contraceptive access elucidates the importance of knowledge related to sexual health outcomes. This aligns with the perceived behavioural control component of the TPB, suggesting that greater knowledge of HIV/AIDS enhances confidence in accessing contraceptives. The previous researchers have largely studied the relationship between HIV knowledge and condom use. In a previous study conducted on Indian adolescents using this UDAYA dataset found an association between HIV/STI knowledge and contraceptive use.[35] Our findings on perceived contraceptive access suggests that knowledge and access may interact. Individuals with higher levels of HIV knowledge may be likely to seek and utilize available contraceptive methods. The

findings suggest that awareness of condom is a significant predictor of perceived contraceptive access among adolescent males and females. This is consistent with TPB's view that particular knowledge pertinent to a behavior improves behavioural control perceptions. It was found that knowledge about condoms and reproduction and attitude towards contraceptive during adolescence predicts the contraceptive use in adulthood.[36] In contrast, a study conducted on African adolescents indicates that there is no significant association between level of awareness and contraceptive use.[37]

The study implies that perceived contraceptive access progressed with age. The study findings indicated that as the age of adolescents progressed, their perceived contraceptive access increased. Similarly, a qualitative study conducted among older American adolescents in California expressed that pharmacies and pharmacists were strongly preferred as accessible sources for contraception, while issues over confidentiality were raised.[38] In contrast, a study conducted on younger adolescents from America exhibited no change in behavior in response to increased emergency contraceptive accessibility in comparison to adolescents from other age groups.[39]

The study highlights the increased probability among adolescent girls from other religious categories of having a greater perception of contraceptive access. A study on female college students in the United States concluded that heightened levels of religiosity, indicated by increased frequency of religious practice, resulted in varying self-perceived effects of religion on the sexual health practices of students.[40]

The study reflects the persistent urban-rural divide that can be observed across developing nations.[41] The study results indicate that both adolescent boys and girls in rural areas have better perception towards contraceptive access. The current study supports the findings from the previous study, which demonstrated that rural adolescents from America have high access to acceptable primary health care services.[42] Similarly, a study conducted among African adolescents have found that the use of modern contraceptives were higher among rural adolescents in comparison to the urban counterparts.[43] A study conducted among rural and non-urban American adolescents have demonstrated the efficacy of School-Based Health Centers (SBHCs) in breaking down barriers to contraceptive use.[44] Similarly, the current study suggests that rural Indian adolescents have a more positive perception of contraceptive access, potentially attributable to the availability of Adolescent Friendly Health Clinics (AFHCs).

The findings suggest that perceived contraceptive access, which aligns with perceived behavioural control component of TPB, is influenced by various factors such as knowledge of HIV/AIDS, gender, age, religion and regional area.

LIMITATIONS

This study presents specific limitations. First, the cross-sectional design limits the ability to establish a cause-and-effect relationship between the variables involved. Second, the self-report nature of the measures introduces social desirability bias. Third, attrition bias can influence the representativeness of the sample. Participants who dropped out between the first and second waves may systematically differ from those who remained in the study. Fourth, the generalizability of the study is limited, as it exclusively includes adolescents from Uttar Pradesh and Bihar. Additionally, this study represents a pioneering effort to investigate the relationship between knowledge of HIV and the perceived accessibility of contraceptives among adolescents in India. Future studies should focus on exploring additional elements that could affect the perception of contraceptive access, including cultural norms and their influence on accessibility.

CONCLUSION

The study emphasizes the association between knowledge of HIV, awareness of condoms, and access to health facilities with perceived contraceptive access. The study also shows notable gender differences, where boys had better access to health facilities and awareness about their sexual health. It also showed older adolescents' better perception of contraception accessibility. The outcomes underline the importance of gender-sensitive policies including health education in schools and training of healthcare providers on adolescent-friendly communication. Future studies can look at specific cultural and community-level hurdles including stigma around the use of contraception and challenges on the access to health facilities for teenage females. This study offers a basis for context-specific sexual and reproductive health interventions addressing individual comfort levels in obtaining healthcare.

Individual Authors' Contributions: SP: Conceptualization, Methodology, Formal analysis, Data analysis, Writing – Original Draft. **TJ:** Supervision, Methodology, Validation, Reviewing & Editing.

Availability of Data: The survey questionnaire is available at

https://dataverse.harvard.edu/file.xhtml?fileId=4163718& version=2.0 & https://dataverse.harvard.edu/file.xhtml?fileId=4163720&versi on=2.0.

No use of generative AI tools: This article was prepared without the use of generative AI tools for content creation, analysis, or data generation. All findings and interpretations are based solely on the authors' independent work and expertise.

REFERENCES

1. Gowers S. Development in adolescence. Psychiatry. 2005; 4(6):6-9. DOI: https://doi.org/10.1383/psyt.4.6.6.66353
2. Hegde A, Chandran S, Pattnaik JI. Understanding Adolescent Sexuality: A Developmental Perspective. Journal of Psychosexual Health. 2022;4(4):237-242. DOI: https://doi.org/10.1177/26318318221107598
3. Eidson-Ton WS. Health Care of the Adolescent. In: Paulman P, Taylor RB, Paulman AA, Nasir LS, editors. Family Medicine: Principles and Practice. New York: Springer; 2020. p 1-9.
4. Moriarty Daley A, Sadler LS, Dawn Reynolds H. Tailoring clinical services to address the unique needs of adolescents from the pregnancy test to parenthood. Current Problems in Pediatric and Adolescent Health Care. 2013;43(4):71-95. DOI: https://doi.org/10.1016/j.cppeds.2013.01.001 PMid:23522339 PMCid:PMC3624884
5. Jakobsson C, Sanghavi R, Nyamiobo J, Maloy C, Mwanzu A, Venturo-Conerly K, et al. Adolescent and youth-friendly health interventions in low-income and middle-income countries: a scoping review. BMJ Global Health. 2024;9(9): e013393. DOI: https://doi.org/10.1136/bmjgh-2023-013393 PMid:39242132 PMCid:PMC11381706
6. Salam RA, Faqqah A, Sajjad N, Lassi ZS, Das JK, Kaufman M, et al. Improving Adolescent Sexual and Reproductive Health: A Systematic Review of Potential Interventions. The Journal of Adolescent Health. 2016;59(4S):S11-S28. DOI: https://doi.org/10.1016/j.jadohealth.2016.05.022 PMid:27664592
7. Mohamed S, Chipeta MG, Kamninga T, Nthakomwa L, Chifungo C, Mzembe T, et al. Interventions to prevent unintended pregnancies among adolescents: a rapid overview of systematic reviews. Systematic Reviews. 2023;12(1):198. DOI: https://doi.org/10.1186/s13643-023-02361-8 PMid:37858208
8. Samkange-Zeeb FN, Spallek L, Zeeb H. Awareness and knowledge of sexually transmitted diseases (STDs) among school-going adolescents in Europe: A systematic review of published literature. BMC Public Health. 2011;11: 727. DOI: https://doi.org/10.1186/1471-2458-11-727 PMid:21943100 PMCid:PMC3189891
9. Sidamo NB, Kerbo AA, Gidebo KD, Wado YD. Exploring Barriers to Accessing Adolescents Sexual and Reproductive Health Services in South Ethiopia Regional State: A Phenomenological Study Using Levesque's Framework. Adolescent Health, Medicine and Therapeutics. 2024;15:45-61. DOI: https://doi.org/10.2147/AHMT.S455517 PMid:38562442
10. Wondimagegne YA, Debelew GT, Koricha ZB. Barriers to contraceptive use among secondary school adolescents in Gedeo zone, South Ethiopia: a formative qualitative study. BMJ Open. 2023;13(3):e060582. DOI: https://doi.org/10.1136/bmjopen-2021-060582 PMid:36997244 PMCid:PMC10069515
11. Swenson RR, Rizzo CJ, Brown LK, Vanable PA, Carey MP, Valois RF, et al. HIV knowledge and its contribution to sexual health behaviors of low-income African American adolescents. Journal of the National Medical Association. 2010;102(12):1173-1182. DOI: https://doi.org/10.1016/S0027-9684(15)30772-0 PMid:21287898
12. Elshiekh HF, Hoving C, de Vries H. Psychosocial determinants of consistent condom use among university students in Sudan: findings from a study using the Integrated Change Model. BMC Public Health. 2023;23(1):578. DOI: https://doi.org/10.1186/s12889-023-15466-5 PMid:36978037 PMCid:PMC10045195
13. Ismael AS, Sabir Zangana JM. Knowledge, attitudes and practice of condom use among males aged (15-49) years in Erbil Governorate. Global Journal of Health Science. 2012;4(4):27-36. DOI: https://doi.org/10.5539/gjhs.v4n4p27
14. Masoda M, Govender I. Knowledge and attitudes about and practices of condom use for reducing HIV infection among Goma University students in the Democratic Republic of Congo. Southern African Journal of Epidemiology and Infection. 2013;28(1):61-68. DOI: https://doi.org/10.1080/10158782.2013.11441521
15. Davids EL, Zembe Y, de Vries PJ, Mathews C, Swartz A. Exploring condom use decision-making among adolescents: the synergistic role of affective and rational processes. BMC Public Health. 2021;21(1):1894. DOI: https://doi.org/10.1186/s12889-021-11926-y PMid:34666719 PMCid:PMC8527692
16. D'Souza P, Bailey JV, Stephenson J, Oliver S. Factors influencing contraception choice and use globally: a synthesis of systematic re-views. European Journal of Contraception and Reproductive Health Care. 2022;27(5):364-372. DOI: https://doi.org/10.1080/13625187.2022.2096215 PMid:36047713
17. Decker MJ, Dandekar S, Gutmann-Gonzalez A, Brindis CD. Bridging the Gap between Sexual Health Education and Clinical Services: Adolescent Perspectives and Recommendations. The Journal of School Health. 2021;91(11):928-935. DOI: https://doi.org/10.1111/josh.13084 PMid:34523133
18. Ndayishimiye P, Uwase R, Kubwimana I, Niyonzima JDL, Dzekem Dine R, Nyandwi JB, et al. Availability, accessibility, and quality of adolescent Sexual and Reproductive Health (SRH) services in urban health facilities of Rwanda: A survey among social and healthcare providers. BMC Health Services Research. 2020;20(1):1-11. DOI: https://doi.org/10.1186/s12913-020-05556-0 PMid:32727609 PMCid:PMC7392715
19. Yao J, Murray AT, Agadjanian V. A geographical perspective on access to sexual and reproductive health care for women in rural Africa. Social Science & Medicine. 2013;96:60-68. DOI: https://doi.org/10.1016/j.socscimed.2013.07.025 PMid:24034952 PMCid:PMC4609647
20. Janighorban M, Boroumandfar Z, Pourkazemi R, Mostafavi F. Barriers to vulnerable adolescent girls' access to sexual and reproductive health. BMC Public Health. 2022;22(1):1-16. DOI: https://doi.org/10.1186/s12889-022-14687-4 PMid:36447192 PMCid:PMC9706928
21. Dombola GM, Manda WC, Chipeta E. Factors influencing contraceptive decision making and use among young adolescents in urban Lilongwe, Malawi: a qualitative study. Reproductive Health. 2021;18(1):209. DOI: https://doi.org/10.1186/s12978-021-01259-9 PMid:34663362 PMCid:PMC8524908
22. Fishbein M, Ajzen I. Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research. Reading, Massachusetts: Addison Wesley; 1975.
23. Ajzen I. From Intentions to Actions: A Theory of Planned Behavior. In: Kuhl J, Beckmann J, editors. Action Control: From Cognition to Behavior. Berlin Heidelberg: Springer; 1985. p 11-39. DOI: https://doi.org/10.1007/978-3-642-69746-3_2
24. Madden TJ, Ellen PS, Ajzen I. A comparison of the theory of planned behavior and the theory of reasoned action. Personality and Social Psychology Bulletin. 1992;18(1):3-9. DOI: https://doi.org/10.1177/0146167292181001
25. Leone C. A review: Eagly, A. H., & Chaiken, S. (1993). The psychology of attitudes. New York: Harcourt, Brace, & Janovich. Psychology and Marketing. 1995;12:459-466. DOI: https://doi.org/10.1002/mar.4220120509
26. Population Council of India. Understanding the Lives of Adolescents and Young Adults (UDAYA) in Bihar and Uttar Pradesh 2018-19. New Delhi, India; 2019.
27. Chory A, Gillette E, Callen G, Wachira J, Sam-Agudu NA, Bond K, et al. Gender differences in HIV knowledge among adolescents and young people in low-and middle-income countries: a systematic review. Frontiers in Reproductive Health. 2023;5:1154395. DOI: https://doi.org/10.3389/frph.2023.1154395 PMid:37434701 PMCid:PMC10332462
28. Boamah EA, Asante KP, Mahama E, Manu G, Ayipah E, Adeniji E, et al. Use of contraceptives among adolescents in Kintampo, Ghana: a cross-sectional study. Open Access Journal of Contraception. 2014; 5:7-15. DOI: https://doi.org/10.2147/OAJC.S56485

29. Abuosi AA, Anaba EA. Barriers on access to and use of adolescent health services in Ghana. Journal of Health Research. 2019;33(3):197-207. DOI: https://doi.org/10.1108/JHR-10-2018-0119

30. Chandra-Mouli V, Akwara E. Improving access to and use of contraception by adolescents: What progress has been made, what les-sons have been learnt, and what are the implications for action? Best Practice & Research. Clinical Obstetrics & Gynaecology. 2020;66:107-118. DOI: https://doi.org/10.1016/j.bpobgyn.2020.04.003 PMid:32527659 PMCid:PMC7438971

31. Mukhopadhyay S, Mishra SK. Knowledge and Practices About Sexual Health and Its Socioeconomic Correlates Among Adolescent Girls in Sikkim, India. The Oriental Anthropologist. 2021;21(1):49-66. DOI: https://doi.org/10.1177/0972558X211001156

32. Mohd Tohit NF, Haque M. Forbidden Conversations: A Comprehensive Exploration of Taboos in Sexual and Reproductive Health. Cureus. 2024;16(8):e66723. DOI: https://doi.org/10.7759/cureus.66723

33. Ssebunya RN, Boopa M, Nguyen D, Ligon L. Disparities in Accessing Sexual and Reproductive Health Services and Rights Among Adolescents and Young People During COVID-19 Pandemic: Culture, Economic, and Gender Perspectives. Current Tropical Medicine Re-ports. 2022;9(4):234-242. DOI: https://doi.org/10.1007/s40475-022-00274-5 PMid:36311053

34. Taiwo MO, Oyekenu O, Hussaini R. Understanding how social norms influence access to and utilization of adolescent sexual and re-productive health services in Northern Nigeria. Frontiers in Sociology. 2023;8:865499. DOI: https://doi.org/10.3389/fsoc.2023.865499 PMid:37899781

35. Maurya C, Muhammad T, Kundu J, Sulaiman KM. Comprehensive knowledge of HIV and STI and its association with contraceptive use among unmarried adolescents: a two-wave longitudinal study in India. Journal of Public Health. 2023; 33(2):417-426. DOI: https://doi.org/10.1007/s10389-023-02013-0

36. Guzzo KB, Hayford SR. Adolescent Reproductive and Contraceptive Knowledge and Attitudes and Adult Contraceptive Behavior. Maternal and Child Health Journal. 2018;22(1):32-40. DOI: https://doi.org/10.1007/s10995-017-2351-7

37. Hoque ME, Ntsipe T, Mokgatle-Nthabu M. Awareness and practices of contraceptive use among university students in Botswana. SAHARA J: Journal of Social Aspects of HIV/AIDS Research Alliance. 2013;10(2):83-88. DOI: https://doi.org/10.1080/17290376.2013.869649 PMid:24405283

38. Wilkinson TA, Miller C, Rafie S, Landau SC, Rafie S. Older teen attitudes toward birth control access in pharmacies: a qualitative study. Contraception. 2018;97(3):249-255. DOI: https://doi.org/10.1016/j.contraception.2017.11.008 PMid:29223497

39. Harper CC, Cheong M, Rocca CH, Darney PD, Raine TR. The effect of increased access to emergency contraception among young adolescents. Obstetrics and Gynecology. 2005; 106(3):483-491. DOI: https://doi.org/10.1097/01.AOG.0000174000.37962.a1 PMid:16135577

40. Glazer E, Valdez E, DeBlauw JA, Ives SJ. An Analysis of the Impact of Religious Affiliation and Strength of Religiosity on Sexual Health Practices of Sexually Active Female College Students. International Journal of Environmental Research and Public Health. 2023;20(22):7075. DOI: https://doi.org/10.3390/ijerph20227075 PMid:37998306 PMCid:PMC10671411

41. Sharma J, Pavlova M, Groot W. Rural-urban inequalities in health care utilization in Bhutan: a decomposition analysis. International Journal for Equity in Health. 2024;23(1):69. DOI: https://doi.org/10.1186/s12939-024-02178-4

42. Secor-Turner MA, Randall BA, Brennan AL, Anderson MK, Gross DA. Rural Adolescents' Access to Adolescent Friendly Health Ser-vices. Journal of Pediatric Health Care. 2014; 28(6):534-540. DOI: https://doi.org/10.1016/j.pedhc.2014.05.004 PMid:25017940

43. Sserwanja Q, Musaba MW, Mutisya LM, Mukunya D. Rural-urban correlates of modern contraceptives utilization among adolescents in Zambia: a national cross-sectional survey. BMC Women's Health. 2022;22(1):1-10. DOI: https://doi.org/10.1186/s12905-022-01914-8 PMid:35918693

44. Westbrook M, Martinez L, Mechergui S, Scandlyn J, Yeatman S. Contraceptive Access Through School-Based Health Centers: Perceptions of Rural and Suburban Young People. Health Promotion Practice. 2023;23(3):425-431. DOI: https://doi.org/10.1177/15248399211026612 PMid:34338038