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Understanding sexual and reproductive health need of unmarried adolescents and youth in urban slums: evidence from a formative study in Uttar Pradesh, India

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Abstract

Background Despite the intentional focus of national programs and strategies in last decade, unmarried adolescents and youth (AY) face multiple challenges related to sexual and reproductive health (SRH) information, and access to health and counseling services. With massive urbanization and growing slum and more focus on married youth, the situation and need of unmarried AY are often overlooked. The present study explores the SRH need of AY to gain a holistic understanding of the SRH landscape in the context of slums of Uttar Pradesh, India.

Methods A formative qualitative study was conducted in the slums of two cities in Uttar Pradesh using qualitative research techniques—*in-depth interviews (IDI)* and *focus group discussions (FGDs)* with unmarried adolescents and youths aged 15–24 years. Thematic analysis was guided by principles of grounded theory and narrative inquiry, both inductive and deductive approaches.

Results The study found limited awareness of SRH issues and often inaccurate knowledge of modern contraceptives among the unmarried youth. Gendered access to SRH information emerged clearly, with boys benefitting from wider peer network, while girls relied on familial networks. Lack of social networks and support, communication gap, and limited reach of health providers have majorly contributed to misinformation and misconceptions. Information through social media and online sources served as a key source of SRH knowledge among adolescents and unmarried youth, but concerns remained about the accuracy and reliability of the information accessed. Structural constraints such as stigma, mobility restrictions, and provider bias further marginalized unmarried youth—especially girls—from accessing reliable SRH services.

Conclusion The study highlighted demand for SRH knowledge, source of knowledge, major concerns, and opportunities of AY in urban slums. A clear need for multi-faceted strategies targeting sexual health education, adolescent-responsive SRH services, and expanded digital outreach with verified content for this vulnerable populations are identified. However, targeted intervention through system level approaches for AY can be helpful for dispelling myths and providing accurate information.

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Keywords Sexual and reproductive health (SRH), Adolescents, Youth, Unmarried, Slum, Urban

Plain summary

Using qualitative data from urban slums of two cities of Uttar Pradesh, this paper explores the limited knowledge about sexual and reproductive health, sources of information, contraceptive use, and engagement with the health-care system among unmarried youth aged 15–24 years. While traditional norms may disapprove of premarital sex, physical intimacy among unmarried youth is increasing in some parts of India. The major sources of sexual and reproductive health knowledge were peers and sisters-in-laws for boys and girls respectively. However, the social network of boys was wider than that of girls. There is an increasing tide of information through online content in social media, which serves as a key source of knowledge among adolescents, but their accuracy and reliability is questionable. Comprehensive knowledge about contraception is limited, mostly aware of methods such as condoms and pills; however, in-depth knowledge is lacking. Healthcare worker outreach among the unmarried youth was minimal and calls for policy and program intervention.

Background

Adolescents and youth (AY) aged 15–24, comprising around a fifth of the global population, are considered the drivers of social and economic changes in many low-resource settings [1]. Often, this age group has been considered with a group having high emotion and curiosity, which results in many impulsive activities [2, 3]. Along with a phase of positive social integration, personal happiness, and overall well-being, many young people face the consequences due to the possibility of unprotected and risky sexual behaviors that result in high-risk pregnancies at an early age. These vulnerabilities are induced in poor resource settings where sexual and reproductive health (SRH) knowledge and awareness are deficient [4–6]. Interventions and programs to reduce the risk and vulnerability of this population to prioritise their education, health, and understanding of their employment needs are fragmented and lack a systematic understanding [7].

Moreover, youth living in urban slums face unique challenges which are characterized by high levels of unemployment, crime, poor sanitation, substance abuse, poor schooling facilities, and lack of recreational facilities. They are at greater risk for HIV infection, risky sexual behavior, early childbearing, and other adverse SRH outcomes than those in formal settlements. In addition, they live in an environment where knowledge about contraceptive use is inadequate, and access to contraceptive methods is limited [8–11]. Consequently, many governments prioritize this demographic in their programs and policies, investing in interventions to mitigate risks and vulnerabilities while prioritizing their education, health, and employment needs [1, 5].

Ensuring access to SRH services is crucial for achieving health equity and fulfilling the global commitment to "leave no one behind," as emphasized in the Sustainable Development Goals (SDGs). Globally as well as country

level commitments have been made to achieve the broad agenda of universal access to sexual reproductive health and rights (SRHR). The government of India also prioritizes AYs in its development agenda. Policies and programs including the *Adolescent Reproductive and Sexual Health Strategy (ARSH)* (2005–2013), *National Adolescent Health Programme* (2014–present) popularly known as *Rashtriya Kishor Swasthya Karyakram (RKSK)* implemented to support and escalate the demand for essential adolescent health services. Adolescent-friendly health clinics (AFHC) emerged as an integral component of the program, functioned in the health facilities to ensure the delivery of adolescent-specific health services [12–14].

In India, about 23% of women aged 20–24 years were married before 18 years of age and 6% of adolescents began childbearing in 2019–21, as per the latest round of National Family Health Survey (NFHS) [15]. The survey also showed that 11% of unmarried boys and 2% of unmarried girls in the 15–24 age group reported having sex with a disproportionate state and regional variation [15, 16]. Studies focusing on students and working adults in large cities including Mumbai, Pune, Delhi, and Chennai, have indicated that about a quarter of adolescents were sexually active at the time of survey [17–19]. The prevalence may be underestimated, as indulgence in premarital sex is considered a sin and young people don't report it. Studies reveal that though there is a changing attitude towards premarital sex, however, it is still not widespread [20, 21].

For unmarried adolescents, SRH is often overlooked due to societal and cultural norms and stigma. Sexual intimacy and its consequences among unmarried adolescents are less talked about and considered as taboo despite recent shifts observed in the family system, the social and traditional values remained difficult to change with improvements in economic conditions in India [22]. However, with the increase in permissiveness towards

premarital sex, it is seen in higher occurrence, especially in large cities [17–19]. Thus, this formative research was conducted to understand this emerging context for AYs. This paper focuses on examining the knowledge, attitude, and practice of contraceptive use among the unmarried AYs living in urban slums. Additionally, we also focus on understanding their source of information, social circles of their interactions, and the role of various sources and agency in making informed decisions about safe sex and contraceptive use among them. This study infers the perspective of those living in vulnerable slum.

Methods

Study design

This study employed a qualitative formative research design to explore the SRH needs of AY in urban slums. The study was conducted in urban slums of two cities (Varanasi and Firozabad) in Uttar Pradesh and used in-depth interviews (IDIs) and focus group discussions (FGDs) to capture experiences, attitudes, and knowledge regarding SRH. The research aligns with the broader objectives of “The Challenge Initiative (TCI) program led by Population Services International, India in partnership with the National Health Mission and with financial support from the William H. Gates Sr. Institute for Population and Reproductive Health, which aimed at enhancing reproductive health services for underserved urban communities. TCI uses a “demand-driven” model to ensure sustainable impact and unlock public and private sector resources to implement proven health solutions for the urban poor [22, 23, 38]. TCI works with local governments to implement high-impact, evidence-based interventions and practices that strengthen family planning services. This study was commissioned to understand the avenues of intervention for AYs and to accelerate the impact of its model in increasing the use of modern contraceptives. TCI has added AYSRH approaches to its portfolio, building off established national AYSRH

guidelines, strategies, and policies as well as the urban reproductive health initiative (URHI).

Study setting

The study was conducted in Uttar Pradesh, India, which is the most populous state of India with a population of 236 million in the 2011 census, out of which a quarter is youth and adolescent [24]. With the decline in child marriages over the past decades (59% in 2005–06 (NFHS 3) to 16% in 2019–21 (NFHS 5), a huge number of adolescents and youth remain out of marriage for a longer time. Seventeen percent of unmarried boys and 6% of unmarried girls reported having premarital sex in India [15]. Moreover, knowledge about pregnancy, contraception, and the risk of HIV/AIDS is also lacking. Varanasi is one of the oldest inhabited cities in the world, known for its religious significance and traditional artisan communities. It has a population of approximately 1.4 million, with a sex ratio of 879 females per 1000 males. Firozabad is recognized for its glass-making industry, with a population of around 600,000, of which 53% are male. These cities were selected due to their high adolescent and youth population, socio-economic vulnerabilities, and challenges in accessing SRH services [24–27]. The urban slum population in both cities faces limited access to health services, early school dropout rates, and gender-based mobility restrictions. These cities were selected due to their high adolescent and youth population, socio-economic vulnerabilities, and challenges in accessing SRH services [27–31].

Participant recruitment and sampling

A total of 64 qualitative interviews were conducted. This included 24 FGDs (12 each with unmarried boys, and unmarried girls) and 40 IDIs with unmarried youth in relationships. The detailed number of interviews are mentioned in Table 1.

Table 1 Data collection activities across two study sites, urban slums of Varanasi and Firozabad

Description of Activity and Population		Number of Interviews
Focus Group Discussions		
1	Unmarried Boys aged 15–24 years (distributed across 15–17 years, 18–20 years, 21–24 years)	12
2	Unmarried Girls aged 15–24 years (distributed across 15–17 years, 18–20 years, 21–24 years)	12
	Total FGDs	24
In-depth Interviews		
1	Unmarried Boys aged 15–24 years currently in a relationship (distributed across 15–17 years and 18–24 years)	20
2	Unmarried Girls aged 15–24 years currently in a relationship (distributed across 15–17 years and 18–24 years)	20
	Total IDIs	40
Total Data collection activities		64

Participants were recruited using purposive and snow-ball sampling techniques. The study included unmarried boys and girls aged 15–24 years. FGDs were segregated by gender and age groups (15–17 years, 18–20 years, and 21–24 years). Each of these FGDs were comprised of 6–8 participants. A total of 40 (20 each for men and girls) IDIs were conducted with unmarried youth in romantic relationships. Interviews and discussions were conducted in participants' local languages (Hindi and Bhojpuri). Trained interviewers facilitated discussions using semi-structured guides and techniques like card sorting, storytelling, and scenario-based discussions were used to encourage participation. The discussions were moderated by the same sex trained researcher. All sessions were audio-recorded, transcribed, and translated into *English* for analysis.

Data analysis

Thematic analysis was conducted using grounded theory and narrative inquiry approaches. Both inductive and deductive coding methods were applied. A formal codebook was developed through an iterative review of transcripts. Two independent researchers coded the data to ensure reliability using NVivo software for data management. Emerging themes focused on SRH knowledge, contraceptive use, social networks, healthcare access, and gender norms using data-driven themes from literature, as well as codes that arose from the qualitative data.

Ethical consideration

The study has been approved by the *John Hopkins Bloomberg School of Public Health* institutional review board (IRB no: 00009523) as well as an Indian review board institution (10,085/IRB/D/18–19). The trained field assistants reached out to boys and girls identified and recruited for this study. The team explained the objective, need and potential findings of the study. Later, he/she gained their confidence by explaining to them the need for privacy and sensitivity, and their verbal consent was taken.

Findings

Socio-cultural background study respondents

Understanding the socio-cultural context of AYs is essential to comprehending their knowledge and use of contraceptives. The study mainly included participants from the lower socio-economic groups living in the slums of the two cities. The majority of AYs included in the study were not continuing their formal education. The reasons for dropping the school among the boys included financial reasons, engagement in salaried work, and lack of interest in education. However, the familial obligation

of taking care of households was a common occurrence for girls. Sometimes, due to fear of love affairs, parents do not allow their daughters to attend school. However, very few respondents completed school and then moved on to study in college. While very few respondents pursued higher education, some enrolled in industrial training institutes (ITIs) to gain vocational skills. Others, particularly in Firozabad, were engaged in bangle-making and craftwork, contributing to their household income. The economic condition of families played a critical role in educational discontinuation, with many respondents citing the ill health of the primary breadwinner as a significant factor leading to school dropout.

One unmarried girl highlighted this concern regarding her sister's marriage, stating: *"My father also has some health issues. Parents want their daughters to get married till they are alive. My father used to say that if after marriage if your family allows you to do further studies then you can do it—Unmarried Girl, 21–24 Years."*

Discussion with adolescent girls revealed that they face major restrictions in terms of mobility and freedom, and they are expected to come home by evening as compared to adolescent boys in the study areas. These norms restrict women's desire to play sports and engage in physical activity. Citing about girls' mobility a boy expressed *"They (Girls) have a curfew time. They also have to tell where they are going and who they are meeting. They (Parents/guardians) ask multiple questions before they are permitted to go out—Unmarried Boy, 18–24 Years."*

To meet the friends/boyfriends the girls took help from sister-in-law and lied to parents. As mentioned by a boy *"for support, like she can say that she is going to the market with her sister-in-law but instead she is meeting her boyfriend with the support of a sister-in-law. The parents won't ask a lot of questions. She will have to make some excuses to go out for a longer time—Unmarried Boy, 18–24 Years."*

Another younger boy mentioned *"They can go up to coaching and come back from there which is 1 km. If it is far then somebody will pick and drop to the coaching center. Due to fear they do so—Unmarried Boy, 15–17 Years."*

Girls also possess a similar view. As mentioned by a girl *"....Somebody should be there with us like friends or parents should be there with us. College is a different thing and we can go to the college alone but we are not allowed to go outside alone—Unmarried Girls, 18–20 Years."*

However, girls mentioned boys have the freedom in their mobility *"Yes, but they are boys and they are allowed to go anywhere alone. In fact, if they go somewhere their parents give them money to buy things—Unmarried Girl, 18–20 Years."*

Knowledge of contraceptive methods

Although adolescents heard about contraceptives as a mean to prevent pregnancies, the critical and correct knowledge of available methods, how to use them effectively, and which are the most appropriate method for AYs are particularly limited among the unmarried group. AYs in Firozabad were far less aware of different methods than their counterparts in Varanasi. The knowledge in Firozabad was so low that many were unaware of the consequences of unprotected intercourse such as pregnancy; the knowledge about detailed methods is provided in Table 2.

Condoms

The knowledge of condoms is widespread among both boys and girls in the study areas. Youth recognized it as the only method of family planning that they knew. However, some respondents reported, it offers a dissatisfying sexual experience. It is further rejected due to common misconceptions that boys could feel fatigued or fall sick due to its use. One of the respondents reported “..... it is not good to use condoms every time since it can cause health issues. It might cause fever and all that. If you use it too much the girl might not have kids even after she is married—Unmarried Girl, 15–17 Years.

Oral Contraceptive Pill (OCP)

Awareness of OCP was notably higher among unmarried girls. These girls recognized the need for consistent consumption of the pills to prevent pregnancy, although their understanding of the precise consumption schedule was limited. OCPs were identified as being accessible through medical stores and from Accredited Social Health Activists (ASHAs), however, the respondents did not regard the method as a feasible contraceptive option for their own use. This limited adoption may be attributed to gaps in knowledge, the absence of secure private space for storage, and apprehensions regarding potential health risks linked to OCP usage.

Emergency Contraceptive Pill (ECP)

Few participants knew of ECPs such as *Unwanted 72* and *I-pill*. However, it is perceived to be a standard pill to be consumed immediately before sexual intercourse, instead of a method of contraception reserved for emergencies. Unmarried cohorts seem dangerously misinformed about ECP and its functioning and barely have any knowledge of their side effects; even where breadth of knowledge is present, depth of knowledge of dosage and consumption is absent. As reported by a male respondent “.....There is unwanted 72, after having sex with a girl within 72 h you have to give it to the girl and she will

not get pregnant but it has side effects that it will spoil her life—Unmarried Boy, 15–17 Years”.

Other modern methods such as injectables, sterilization, and Intrauterine Contraceptive Device (IUCD) are limited, and only acquired if respondents have some family member who used it. However, the knowledge of availability and use was limited for all respondents.

Traditional methods

Withdrawal was majorly used as a preferred of contraception among unmarried youth. This is because men trust their ability to control themselves and the method promises sexual satisfaction in a way condoms do not..... A few times I have done it without using a condom. I want to experience doing it without using it and that is why I told you there is a difference—Unmarried Boy, 15–17 Years”. However, there seems to be confused knowledge around the calendar method, with adolescents being aware that a certain formula or pattern needs to be followed to successfully use these methods but are often unable to recall the right pattern or formula. Many incorrectly identified the ovulation period in a menstrual cycle (10–14 days after the period which is the most conducive for conception) as the safest time to have unprotected sex. As reported by a male participant” When a girl has her period and you have sex, she will get pregnant. We don't know but the girl knows and so that nothing like this happens we should use a condom—Unmarried Boy, 18–20 Years”.

Social networks and gender differences in SRH knowledge

Social circles and networks played a crucial role in shaping SRH knowledge and behaviors among adolescents. Girls' social circles operated in layers, where they primarily interacted with close family members, such as sisters and sisters-in-law, and relied on female peers within their limited mobility range. Discussions on SRH topics remained largely within these intimate spaces.

Boys, on the other hand, had wider social networks and were more likely to discuss SRH topics with their peers, seniors, and older male family members. Unlike girls, boys engaged in these discussions more uniformly across their social groups, leading to greater exposure to varied perspectives on SRH issues (Fig. 1). The unmarried cohort finds numerous ways to engage with each other, which are categorized as offline and online networks. Information is often passively available to unmarried adolescents and youth from various sources.

School and community friends

Friends from schools, colleges, or communities are one of the sources of information about SRH and contraceptive methods. These sources are often different for unmarried

Table 2 Breadth and depth of contraceptive knowledge among the participants

Type of contraceptive methods	Methods of contraception	Source of information	Points of procurement	Depth of knowledge	Reasons for being used	Reasons for not being used
Modern methods of contraception	Condom	Friend circles School biology For girls – older females of the family	Medical store	Necessary to prevent pregnancy Used by men Easily Accessible and available	Prevent pregnancy Protection from STD's Known to very few people	No time to buy Belief in withdrawal Shyness in buying
	OCP	For girls– older females of the family	Medical store ASHAs while counselling other females of the family	Used after sexual Inter-course	<i>Not used but basic knowledge is known</i>	-
	IUCD	For girls—family members	ASHA	Known to only Few males—Given to the girl in lukewarm water and consumed just like a tea	<i>Not used but basic knowledge is known</i>	-
	Injectable ECP	For girls—family members For boys—Friend circles	- Medical Store	Not Known to the boys Can be used after sexual intimacy to prevent pregnancy if condom is used	<i>(Use not considered)</i> If condom is not used or doesn't work	- Relatively low awareness Only few boys knew about this method
Traditional Methods	Withdrawal	Boyfriend—learns from friends	-	Successful withdrawal can prevent pregnancy	Easiest in terms of logistics- nothing to buy or hide Boys have immense faith in the method	-
	Calendar Method	-	-	Counting the days correctly will allow the couple to have unprotected intercourse, many feel 10–14 days after the period is the safe period to have unprotected sex Also some believed sex during periods is unsafe	Followed by many unmarried boys Girls usually tell about their menstrual cycle	-

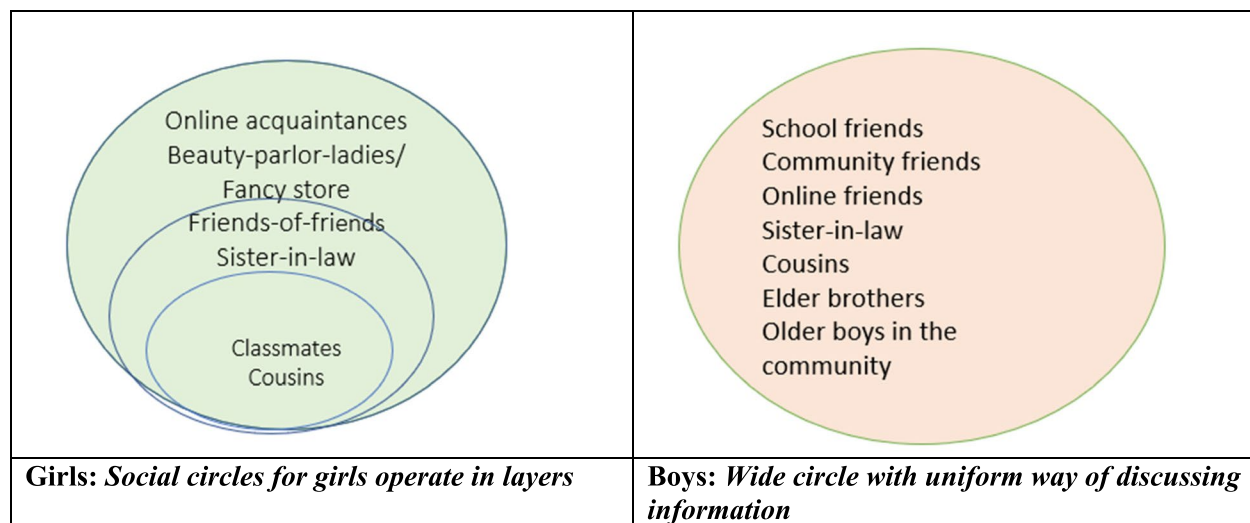


Fig. 1 Social circles of information for boys and girls

girls and boys, despite having similar friend circles. Girls share crushes, boyfriends, and sexual intimacy with school friends who are disconnected from family. Conversations about intimacy and private life are more likely to be anecdotal for girls. Conversations around contraceptives appear to be more prevalent among friends made in the community, who often circle within the family, for unmarried girls. Unmarried boys appeared to have similar conversations across groups from school and their community but might have a greater sense of comfort with friends from the community. Unmarried boys usually have friends who are older than them who provide the information. Mentioned by an unmarried boy “My friend told me about it (about sex and contraceptives). He said that we need to use condoms so that sperm will not come out from it.—Unmarried Boy, 15–17 Years”.

Family

Among the girls, married sisters and sisters-in-law were the major sources of information to teenage girls. Sometimes mothers educate their daughter on aspects of sexual and reproductive health, such as the need to use contraceptives during sexual intercourse. “My sister-in-law told me all this and she also told me about condoms. Because my sister-in-law told me that is why I know all this”. She has 3 sons and 1 daughter, and they used condoms and after they got a son they have taken the injection for 5 years—Unmarried Girl, 18–24 Years”.

Unmarried girls eavesdrop on conversations ASHAs with married girls in the house and gather some surface-level information on contraceptives. Apart from that, the school biology classes also contribute to their understanding of human reproduction and need of

contraceptives. Mentioned by a girls “ This (About sex and contraceptive) I heard when speaking about my aunt and ladies come from ASHA who come and speak openly to everyone and go—Information on Contraceptives—Unmarried Girls, 18–20 Years”.

Parents and other relatives have very different approach when they knew about the relationship of the unmarried girls and sometimes it has severe consequences such as discontinuing school and early marriage. In some cases, girls were forced to move out of the village to save face and continue schooling from a different location, where they would live with distant relatives. Thus, a complete disconnect from life as it is a constant threat in the lives of unmarried girls who have a boyfriend.

Mentioned by a young girl “.....If I have a boyfriend in the village and I talk to him, then parents will get angry. If somebody tell them about him then parents will feel that it’s an insult of them and they will decide to do my marriage—Unmarried Girls, 15–17 Years”.

A young boy mentioned “.....In my class there is a boy and girl who was in class 9th and they were girlfriend and boyfriend. When her brother came to know he didn’t allow her to go to the school. Now she is going to some other school, outside the city—Unmarried Boys, 15–17 Years”.

However, boys share open relationships with their sisters-in-law and feel comfortable discussing sexual intimacy and precautions with them. If the same comfort is shared with the elder brother, Reported by a boy “No. My sister-in-law knows but no one else. She is her relative. She does speak to her. No one really speaks to them as such otherwise—Sister-in-Law is Aware About their Relationship” Unmarried Boys, 18–24 Years”.

Online engagement

Digital media such as social media apps, websites with pornographic content, and television remained very commonly used mediums among the youth to understand SRH issues. Adolescents make online friends, and it allows for open conversations related to boyfriends, sexual intimacy, contraceptives, and other aspects of SRH. However, there was a fear of the conversation being recorded and leaked, threatening the identity and image of the person sharing experiences. Thus, these comfort levels in these conversations take some time to develop. Because of these conversations, unmarried girls passively gained knowledge of condoms, MA kits, and injectables. Unmarried boys aged 15–17 years usually have some older friends who talk about sexual intimacy but not necessarily contraceptives. Online engagement might seem contingent on owning a phone. This study revealed that unmarried young boys and girls were more prone to use social media apps such as *Facebook*, *Tiktok*, *YouTube*, and other social media activities to learn about topics that they were interested in. Content on sexual intimacy and contraception were consumed in various formats but primarily depended on *YouTube* videos. Mentioned by a boy *"....Sometimes on YouTube, I look for knowledge on sex. Sometimes I feel curious to know about something so I search on YouTube. Something which we cannot ask anyone. Like how twins are born—Unmarried Boys, 18–20 Years"*.

Information about contraceptives is claimed to be acquired from advertisements and television programs, and through *YouTube*, newspapers, and *Facebook*. Knowledge of contraceptives like condoms was also acquired from shows such as *"Savdhaan India"*¹ and *"Crime Petrol"*². However, advertisements about condoms are seen on television and other media platforms, giving them basic knowledge of condoms. With increased access to the internet, similar roles of educating and influencing young married couples on family planning could also be played by online sources and networks.

Contraceptive use and role of agency

Respondents reported there are high prevalence of unprotected sex in the community. Nine of ten AYs reported consensual sexual relationships, only three of them would be likely to use condoms for safe sex. The reasons behind the non-use of condoms were sexual dissatisfaction and difficulties in procurement. Sexual satisfaction is perceived to be greater without condoms, and there is a persisting desire among youth to be intimate

without using it. Withdrawal seems to be the most prevalent method of contraception adopted by unmarried boys. It reinforces the man's ego; withdrawal instills a sense of control in men while using a method of contraception implies dependence.

As mentioned by a boy *"...‘Did not use protection because I knew that I would be able to control and when I was doing and I knew it would come, I took it out and I sent her and then I did what I had to do. There was no fear, I didn't do it inside and I asked her if there was any fear and she said no—Unmarried Boys, 18–24 Years"*.

It is found that the decision of using contraceptives primarily depends on the male partner as compared to female. Respondents agreed that a boy can convince her girls to not demand contraceptives if he does not want to use it. Among girls, there is faith that the boyfriend knows better since boys discuss sexual intimacy freely among themselves. Girls who choose to be sexually intimate trust that their boyfriends would not let any harm and protect them from pregnancy—even when he insists on using withdrawal instead of condoms. Thus, in the presence of knowledge of contraceptives and the inclination to use one, traditional methods take precedence over modern methods. Beyond emotional pressures, very few girls felt that matters could escalate to physical coercion or sexual violence in a relationship— the worst outcome imagined by most girls was the boyfriend leaving his girlfriend for a girl more willing to be sexually intimate with him. But at the same time, they agreed that at a broader level, the onus of preventing pregnancy lies on women. If she does get pregnant, the question asked is why she chose to be sexually intimate rather asking why couple did not use any means of protection.

Discussion

This paper offers insight into knowledge and attitudes towards SRH, sources of knowledge of contraceptives, and use of contraceptives among vulnerable slum youth and adolescents in India. The paper has analyzed the triggers and barriers of knowledge and attitude toward SRH through a gender lens. Though AYs living in slums are more vulnerable in getting the right information of SRH, girls are more compromised towards it. The lower knowledge and access to SRH among girls were due to individual, social, and structural barriers. Early dropouts, poor economic conditions, lower agency, and decisions limit the women's knowledge and attitude. The lack of knowledge further escalated in the vulnerable section of the community—uneducated or school dropouts, and those living in urban slums. In this context, this paper prioritizes the need for providing the right and adequate knowledge to the unmarried youth living in slums, which will be helpful; in

¹ Television show in India regarding crime and investigation.

² Television show in India regarding crime and investigation.

achieving the broad agenda of SRHR in India. The findings and their implications are summarized below.

Our study suggests that much of the knowledge of contraceptives remained around *condoms* as compared to other methods. The higher knowledge of condoms may be due to the higher influence of social media and open advertisement of the methods [11, 32]. The findings are aligned with studies conducted in another rural and urban setting in India [29, 30, 34]. Respondents see modern methods of contraception as inappropriate for unmarried people. Hence, the study evident that the youth have lower knowledge of the other modern methods of contraceptives such as OCP, IUCD, ECP, Injectables etc. as aligned with other studies. This may be due to the factor that adolescents, especially those who are most marginalized or vulnerable, are not being reached by adolescent health programs which have been evident from other studies [4–6, 20].

The findings suggest that decision-making around contraceptive use is predominantly male-driven. Social norms reinforce the idea that male partners dictate contraceptive choices, leading many young girls to rely on withdrawal methods despite awareness of modern contraception. This aligns with existing literature, which indicates that gendered power dynamics significantly influence reproductive health decisions among adolescents [27, 29, 33, 34].

Adolescents reported despite knowing about condoms, there appeared to be less emphasis on the use of it. The use of condoms highly relies on the male partner and that is also based on the advice of friends/elders. The use of condoms usually occurs when intimacy is planned, and both partners are inclined towards adopting a method of contraception. However, the girls's decision regarding the use of the method hardly matters, as the male partner convinces her to use/non use it. Unmarried girls have restrictions of movement and freedom which leads to less access and agency in decision-making about the use of contraceptives. Though girls have higher consequences in terms of unprotected sex, but their lower knowledge, lower agency towards the SRH decision, and over-reliance on the boy decision impact the use of it. Our study is in line with other studies reported social and community norm are a major barrier in accessing SRH knowledge [2, 5, 34]. Though there is an optimum change in cultural values and norms related to SRHR, the procurement of contraceptives remains a difficult task for unmarried youth. Though boys have higher access to the methods, girls are normally hindered from availing it through the medical shop due to societal norms. Though certain FP methods are available online, its access is still low in the majority of peri-urban area.

Unmarried young people are overconfident in their ability to prevent pregnancy through traditional methods of contraception. We found majority of the sexual debuts are unprotected as it is unplanned or in the thinking of it will not converted towards pregnancy. This may be due to two factors. Given the community taboos surrounding sexual intimacy among unmarried couples, they do not find a conducive environment to adopt safe sex behaviors and sexual debut is often unplanned, unprotective, and impulsive. Secondly, the boys were misinformed about the unintended consequences of unprotected sex through their friends and elders. The knowledge about sexual reproductive health through friends and some unreliable sources is always believed by young boys.

Considering the data collected from the unmarried adolescents and youth, it reflected that their social circles played an influential role in SRH awareness. However the social circles varies, more wider for boys as compared to girls. Girls received the knowledge from their school friends, sister/sisters-in-law in the households, and however the discussion was limited. However, the boys received such information and support from friends/seniors, or elder brothers. On the other hand, social networks and digital media increase awareness of SRH. An emerging body of literature found a paradigm shift in the information-seeking behavior of adolescents, where they prefer to receive SRH information from mass media and digital media platforms such as *television, Facebook, WhatsApp, YouTube*, etc. [25]. However, it also increases the risk of misinformation, which is an additional obstacle to the consistent and effective use of contraceptives among adolescents. Although youth are exposed to digital media and social networks and interact with health workers, there is a positive change in their SRH behavior and uptake of modern contraceptives. Despite these initiatives, unmarried adolescents face structural barriers such as social conservative norms, lack of female autonomy, shyness, and restricted social mobility that deter their chances of accessing accurate information on SRH [16–19].

In recent years India has embarked an ambitious journey towards the SRH among the youth- a transformable step towards the health and wellbeing of youth. Currently, through the RKSK program, outreach to adolescents and youth has been improved and facilities provide the needful services. Prioritizing adolescent services through Adolescent Health Day (AHD) was a major step towards transforming adolescents' attitude towards SRH. Moreover, the school health wellness program, recently launched by the government, is another potential platform to provide information regarding various topics including the SRH needs of adolescents. Education among the respondents prevailed as windows of

opportunity for getting knowledge about various sexual reproductive matters through biology classes, in addition to sex education and life skill interventions beyond schools. Working at the community as well as system level, the larger aim lies at reaching all adolescents and youth toward providing correct knowledge [12, 14, 35].

However, the evidence suggests that these efforts are unequally reached to all the vulnerable populations. At its core, there is a need for the government, NGOs, and local community leaders to influence the youth which has a lasting impact. Above all knowing their right and accessibility of methods may be support in any kind of mis-happening that leads to physical and mental illness. Despite these initiative, hurdles remain that undermine the progress. The lower level of knowledge, lower agency and decision making, and misconceptions regarding contraceptives among some segments of youth present a tangible challenge.

Identification of this vulnerable population and reaching them are necessary steps towards achieving broad agenda of the sexual and reproductive health and rights. Community outreach activities need to be strengthened to inform adolescents about services and encourage them to make use of services. Recently through community health officers at the Ayushman Arogya Mandir, the government is trying to reach these adolescents. Similarly, sensitising teachers and providing SRH knowledge in school is also an innovative solution. At the same time, providers need to be trained to be non-judgmental. There are evidence in India and other settings, provider bias affects the adolescent health program [36]. Lastly, as per the Annual Status of Education Report (ASER), one-third of Indian teenagers in rural areas use the internet and half can find a video on YouTube [28]. Recently, an Randomized Control Trial (RCT) study in India evident that, digital game-based content was successful in increasing knowledge about methods and fertility awareness [37]. Hence, providing SRH knowledge through digital methods may be helpful, however, the content needs to be reviewed and reach to the right person.

Limitations of the study

This study was conducted purposefully to understand the context and support the implementation and scale-up of the AYSRH program under the TCI initiative in selected urban areas. While the study provides valuable insights into the triggers and barriers to contraceptive use among unmarried adolescents and youth in the urban slums of Uttar Pradesh, it is important to acknowledge several limitations. The study was confined to slums in two cities, and as such, the findings may not be generalized to other urban or rural contexts. The limited geographic scope restricts the broader applicability of the results. A significant challenge was encountered in participant

recruitment, particularly among unmarried girls. Despite efforts to obtain permission from parents and community elders, some individuals declined participation, leading to potential selection bias. Only those willing to participate were interviewed, which may have influenced the study's findings. The study's focus on SRH posed challenges in terms of social stigma and fear of consequences and hesitation in sharing personal information. To address the sensitivities surrounding the subject matter, the study team took extensive measures to build trust with the participants. This included rapport building and the use of projective techniques by the moderators to encourage participation and ensure confidentiality.

Conclusion

This study underscores the urgent need for comprehensive interventions to improve the SRH of unmarried youth, acknowledging the prevailing conservative social norms surrounding relationships and sex. The findings reveal significant gaps in SRH knowledge, including limited access to accurate, non-judgmental information, low awareness of family planning methods, and restricted avenues for discussing menstrual hygiene and safe sex practices. Therefore, interventions must address these challenges by normalizing open communication about safe sex and empowering youth to exercise agency in family planning decisions. This includes engaging key gatekeepers and sensitizing healthcare providers to eliminate biases against unmarried youth seeking SRH services. Ensuring easy access to contraceptive counseling and services at public health facilities is crucial for meeting their reproductive needs and upholding their rights and well-being. Furthermore, leveraging digital media platforms to disseminate accurate SRH content is vital for dispelling misconceptions. While this study does not aim to directly change social norms, understanding these norms, particularly their influence on young girls, is vital for designing effective and culturally sensitive interventions. A multi-pronged approach encompassing education, community engagement, digital outreach, and accessible healthcare services is paramount to fostering positive SRH outcomes for unmarried youth.

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Authors' contributions

The authors confirm contributions to the paper as follows: study conception, design, data collection: MS, HS, ED, NP; data coding and analysis: ED, NP, BKP interpretation of results and manuscript preparation: BKP, AK, ED, SB, KG, and IS reviewed and edited the manuscript, All authors approved the final version of the manuscript.

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Data availability

The datasets used and/or analyzed during the current study are available from the first author/corresponding author.

Declarations

Ethics approval and consent to participate

The study has been approved by the John Hopkins Bloomberg School of Public Health institutional review board (IRB no: 00009523) as well Indian review board institution (10085/IRB/D/18–19). Appropriate consent have been taken from the participants during the data collection.

Competing interests

The authors declare no competing interests.

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