

Perceived Sexual and Reproductive Health Needs and Service Utilization among Higher Secondary School Students in Urban Nepal

Kiran Bam^{1,*}, Fariha Haseen², Rajendra Kumar BC³, M. Sophia Newman⁴, Asiful Haider Chaudhary⁵, Rajshree Thapa⁶, Ismat Bhuyia⁵

¹James P Grant School of Public Health, BRAC University, Dhaka, Bangladesh

²Department of Public Health and Informatics, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka, Bangladesh

³Pokhara University Research Center (PURC), Pokhara University, Nepal

⁴Fulbright Student Researcher

⁵BRAC Institute of Global Health, BRAC University Mohakali, Dhaka, Bangladesh

⁶Institute of Medicine, Maharajgunj Medical Campus, Tribhuvan University, Kathmandu, Nepal

*Corresponding author: bam.kiran@gmail.com

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Abstract Introduction: Adolescent sexual and reproductive health (ASRH) is best addressed through the promotion of responsible, healthy behavior and the provision of age-appropriate services. This study aimed to assess Nepali adolescents' perceived ASRH service needs and factors influencing their utilization of ASRH services. **Methodology:** This descriptive cross-sectional quantitative study was based on a structured, self-administered questionnaire of adolescents aged 15-19 (n = 338) in three government-run higher secondary schools in Bhaktapur, Nepal. Descriptive data was used to summarize socio demographics, sexual activity, and awareness and usage of SRH services. Chi-square and Fisher's exact tests and binary logistical regression modeling were used to identify factors influencing ASRH service utilization. **Results:** ASRH service utilization was 9.2% among all respondents. Service utilization was lower among female (4.3%) than males (12.5%). Fifteen percent of students had ever felt a need to access ASRH services, a larger percentage than those who had accessed ASRH services (9.2%). Almost 37% intend to utilize ASRH services in the future. Students attending secondary schools that included ASRH in the school's health services were 15 times more likely to utilize ASRH services (Adjusted OR: 14.85). The distance from health facility (Adjusted OR: 12.80) and being sexually active within 12 months (Adjusted OR: 10.31) were found to be associated with ASRH service utilization. Those who perceived barriers to services were more likely to utilize the services (Adjusted OR: 7.05). Lack of confidential services was the biggest barrier (71.4%), while friend and peer group influence (86.7%) was a major motivator to access ASRH services. **Conclusion:** ASRH service utilization among the adolescents is very low, with a gap between perceived needs and service utilization. Students who have accessed ASRH services are more likely to report that they perceived barriers, demonstrating that logistical difficulties may be considerable. Accessibility should be expanded.

Keywords: *sexual and reproductive health, needs, service utilization, Intermediate College, Nepal*

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1. Background

Adolescents (people aged 10-19 years) account for one-fifth of the world population, or 1.2 billion people [1]. Adolescents form a pillar of every economy, which means their health and well-being is crucial to economic development [2]. To attain health-related Millennium Development Goals (MDGs), states must respond to the needs of this demographic [3]. Yet adolescents' health needs are underutilized by public health programs [4,5].

During adolescence, people experience numerous changes in health status. Adolescence-specific problems and emerging adult disorders can include sexual problems, menstrual problems, and mental and behavioral health problems [3]. In addition, adolescence is when individuals transition from parent-directed healthcare usage to self-determined usage [6]. Therefore, entree to health services during this period can improve adolescents' health, adjust risky behaviors, and promote healthy habits [7]. Adolescent sexual and reproductive health (ASRH) is one vital component of adolescent health. ASRH needs involves providing age-appropriate services [8] including counseling, family planning, voluntary counseling and

testing, and treatment of sexually transmitted infections [9]. Optimally, these services must safeguard adolescents' rights to privacy, respect, and informed consent, while respecting cultural and religious values and the rights and responsibilities of parents [10].

In Nepal, adolescents represent 23.62% of the total population [11]. Presently, very little healthcare provision is tailored to this demographic. However, conditions indicate this population requires increased sexual and reproductive healthcare attention. Little evidence has documented ASRH service use and satisfaction among higher secondary school-attending adolescents in Nepal.

A recent study conducted by Nepal's Ministry of Health and Population shows that 29% of late adolescent (15-19 years) females are married [11]. Such women are at higher risk of early pregnancy and maternal morbidity and mortality [3] as well as limited education and poor employment opportunities. The unmet need for family planning in Nepal has been estimated to be highest (42%) for married girl's age 15-19 years, as only 14.4% of adolescents use modern contraceptive methods [12]. Adolescents have problems with sexual behavior, use of contraception, early and unwanted pregnancies [13]. Sexually Transmitted Infections (STIs) are common among adolescents who practice unprotected sex or engage in risky sexual activities, have multiple partners, abuse drugs, and lack information on ASRH [12]. Adolescents in Nepal have poor knowledge of ASRH and difficulty in accessing services for their health needs [11,12,14,15]. Adolescents lack access to proper information and services about ASRH issues [14], and available information is often inaccurate, insufficient, and perplexing [16]. Familial and societal boundaries may also complicate ASRH.

There is increasing recognition that services should be more "youth-friendly." After 2000, Nepal developed and issued the "National Adolescent Health and Development Strategy." An implementation guideline on ASRH was developed in 2007 to help district health managers use the strategy, and a national ASRH program was designed in 2011 to provide services and information for physical, mental, psycho-social, and sexual health issues through confidential counseling for adolescents (10-19 years).

The Government of Nepal has been striving to make 1,000 health facilities adolescent-friendly by 2015 [17]. But at the national level, very little information exists on the quality and satisfaction of ASRH services, Nepali adolescents' perceived needs and current service utilization patterns, facilitators and barriers. This limits our understanding of what works best to strengthen services. In order to properly plan services for Nepali adolescents, increased knowledge is crucial. Amongst the many means to measure adolescents' needs, their own reports of health behaviors and lifestyles and utilization of health services are especially valuable. This data allows adolescents to be heard, as opposed to adult professionals making judgments on them [18]. The information obtained can inform health policy, resources, and availability that determine individuals' health service use.

Andersen's phase two model of health service utilization [19] offers a structural viewpoint to investigate an array of individual, environmental and provider-linked variables associated with decisions to seek health care. It suggests that the use of health care services is a function

of three sets of determining factor: predisposing characteristics, which principally include demographic factors, such as age, sex and education level and consumption of health services; enabling characteristics such as family and community resources, economic status, access to healthcare facilities and availability of assistance; and need characteristics, which include perceived needs for services and expected benefits from treatment. This study aimed at assessing perceived SRH needs, reported use of SRH services and factors associated with service utilization among secondary school students in Bhaktapur, Nepal, using the Andersen's model.

2. Methodology

This study is a descriptive quantitative cross-sectional study.

2.1. Study Location

The purposively selected location was Bhaktapur district, in central Nepal fifteen kilometers east of the capital, Kathmandu. It is one of 75 districts in Nepal, and is in the most urbanized part of the country, with 55.1% of the total population of 304,651 residents considered urban [20]. The population is predominantly of the *Newar* ethnicity, and most residents are farmers, semi-skilled or unskilled laborers, or daily wage earners [20]. According to the Department of Health Services' annual report, the estimated adolescent population aged 10-19 years in 2011-12 was 6947 (21.9% of total population). This location was selected because Bhaktapur district is implementing the ASRH program [21], which means this survey can be used as an assessment of need or as a baseline for determination of the impact of those services.

2.2. Participants

Education system in Nepal can be classified as school education and higher education. School education comprises primary level of class 1-5, lower secondary and secondary levels includes class 6-8 and 9-10 respectively. A national level School Leaving Certificate (SLC) examination is conducted at the end of class 10. Class 11 and 12 are considered as higher secondary schools. Higher Secondary Education Board (HSEB) supervises higher secondary schools which are mostly under private management. Previously these grades were under the university system and were run as proficiency certificate level. However some universities still offer these programs, the policy now is to incorporate these class into school system.

The study participants were students of class (grade) XI and XII, who were studying in one of three local higher secondary schools from September 2013 to January 2014.

The inclusion criteria were any adolescent aged 15-19 years, irrespective of gender. Any student who was too sick to participate or unable to write a response to the questions was excluded. Consent was sought, as explained below.

Bhaktapur district contains two municipalities, Thimi and Bhaktapur municipality. The district has thirteen co-educational secondary schools and five government secondary schools. For this study, we purposively sampled

a total of three government schools from two municipalities. The sample was proportionately divided between the three schools according to each school's total population, as reported in a document obtained from the District Education Office in Bhaktapur [22].

A previous study in Nepal estimated reproductive health service utilization among adolescents aged 15-19 at 33.8% those who are still at school [15]. At 95% Confidence Interval (CI) with an allowable error level of 5%, the study required a sample of 339 persons. Allowing for a 10% non-response rate, the sample size was 373.

The study used systematic random sampling. In each school, the total number of students was divided by the desired sample size and students were picked from attendance registers based on that interval (Table 1).

Table 1. Sample size calculation

Sample School	Total No of Students	% of Total	Desired sample 373 distribution	Analyzed
School A	380	52.1	194	180
School B	190	26.0	97	81
School C	160	21.9	82	77
Total	730	100	373	338

2.3. Questionnaire Development

This study investigated demographic characteristics, perceived SRH needs, SRH service preferences, and service utilization. It was adapted from previous studies, and a WHO-recommended questionnaire for adolescent SRH was added [23,24,25]. Modifications were made to the original questionnaire to reflect the cultural context of Nepal, and a local public health and medical graduate helped to translate the questionnaire into Nepali. Modifications were made to the skip pattern of the questionnaire (in that sexually active students asked to complete an additional section), and sexual activity-related questions were rephrased into local Newari dialect.

We pre-tested the questionnaire with 34 participants in a government secondary school in Balkumari, Kathmandu district, Nepal. The age, background, and grade level of the students were similar to study participants.

After pretesting, the Cronbach alpha's value was checked in different components of the questionnaire. The scale-reliability coefficient of knowledge of ASRH services was 0.8490, and for perceived ASRH needs, it was 0.8154. For ASRH service utilization question, it was 0.8183, and for questions on sexual activity it was 0.8012.

2.4. Ethical Approval, Institutional Permission, and Participant Consent Procedures

Ethical approval was obtained from the Institutional Ethical Review Board of James P. Grant School of Public Health, BRAC University, prior to the data collection. Study instruments were also reviewed and approved by the Bhaktapur District Education Office in coordination with the Bhaktapur District Health Office. The study also received approval from the higher secondary school committee before data collection. Principals sent a letter and parental consent form to all parents whose children were under 18 years of age. Written informed consent was taken from all of these parents and from all research participants (irrespective of their age) before data collection. An information sheet describing the study purposes, risks

and benefits of participation, confidentiality procedure, and right to decline participation was given to all participants at the time of the consent process.

2.5. Administration Process

We met with school authorities to ask for permission and a favorable time to collect data. We consulted with the teacher of each class before the students' lunch break, and with their permission we described the research to the students. The questionnaire was self-administered on paper. Self-administration of questionnaires was employed to increase the adolescents' willingness to disclose sensitive information [26] and offer a greater sense of anonymity and confidentiality [27]. Confidentiality was also assured by teachers' absence during the questionnaire completion process. Before they start to fill out the questionnaires, participants received verbal instructions and researchers demonstrated how to write responses. Written instructions were also included on the questionnaire. Participants completed questionnaires during lunch or leisure time. Researchers answered questions from participants while they completed the questionnaires and participants were allowed to skip any question that made them uncomfortable. Local language (*Nepali/Newari*) was used to avoid potential misinterpretations.

2.6. Variables and Measurements

The dependent variable in this study was whether a participant had ever utilized SRH services anywhere in the country, whether in government or private health institutions. This was measured through the dichotomous response (yes or no). The positive response was further validated with questions on the type of SRH services utilized. This listed family planning, sexual information sessions, counseling, HIV-related services, and sexually transmitted infections (STIs) testing and treatment. An affirmative response to any one of these services was regarded as service utilization.

Self-reported ASRH service needs were assessed with respect to type of service and location of access the adolescents said they needed.

This study's independent variables included Socio-demographic variables (age, religion, ethnicity, gender, family income, family relationship quality, and marital status); individual factors (including peer pressure-influence from the friends, family environment-discussion on SRH among family members, and sexual activities-involvement within sexual related matters); and health accessibility (perceptions of the availability of ASRH services in and outside of school, distance service facilities, cost of services, and facility waiting times). General awareness about the availability of adolescent sexual and reproductive health services was assessed by asking participants whether they were aware of any healthcare facilities that provided ASRH services in Bhaktapur district. Additionally, SRH knowledge was assessed via a 20-item scale on knowledge of availability of SRH services, sources of SRH information and services.

2.7. Data Analysis

Data were entered into Epidata 3.02. After accuracy checks, questionnaire responses were coded and data was

exported to STATA 12.0 and SPSS 17.0 for analysis. From the 20 SRH knowledge questions, a knowledge mean score was calculated. The mean, standard deviation (SD), median, and interquartile ranges were computed for all continuous variables. Frequencies and percentages were computed for categorical variables. Statistically significant associations between independent variables and the outcome variable were calculated using first bivariate and then multivariate logistic regression analysis using chi-square and Fisher exact tests at significance $p < 0.05$ with 95% CI. The factors that were significant at 95% CI or $p < 0.05$ were subjected to multivariate analysis to determine confounding effects and to identify individual factors that facilitated SRH service utilization. Before subjecting variables to multivariate analysis, we performed a multi-collinearity test. The variance inflation factor (VIF) value was 1.00, indicating there was no multi-collinearity issue. We completed a Hosmer and Lemeshow test to test goodness of fit. The model was found to be fit ($p = 0.661$) with overall predictability of the test to be 95% of binary logistic regression. We used the enter method to produce the final model. Multivariate analysis was performed to examine the relative effect of each of the significant variables with the effect of other variables remaining constant. Fisher's exact test was used when one or more of the cells contained values ≤ 5 .

3. Results

3.1. Response Rate

A total of 373 questionnaires were circulated. Of these, 35 questionnaires were omitted from analysis, as they were missing answers to >30% of questions. Therefore, final response rate was 90.6% (338/373).

3.2. Socio-demographic Characteristics

The participants were in the age range 15-19 years, with a mean age of 17.1 years (SD=1.0 year). Students were almost equally divided between class XI and XII (Table 2). Males were 59.2% of the sample ($n = 200$), while females were 40.8% ($n = 138$). About 3% of the students were married. The majority of students were from the privileged Janajati caste (52.7%), followed by privileged Brahmin/Chhetri caste (33.4%). Hinduism (92%) was the dominant religion among students. Three of every four (75%) students were living with their parents, and 11.5% lived independently in rental housing. Most students (61.0%) described their family relationships as very close, and another 22.5% said their family relationships as neutral. Results are summarized in Table 2.

3.3. Sexual Activity

Among the 338 participants, 40 students reported having had sex within the last twelve months, including 6.5% of female students ($n = 9$) and 15.5% of male students ($n = 31$). Nearly all female adolescents who reported having sexual intercourse said it was occurring within their marital union. Only 4.5% of never-married female students reported having had sex ($n = 6$). In contrast, the proportion of never-married males who reported sexual intercourse was 14.3%.

Table 2. Distribution of Socio-demographic characteristics of students aged 15-19 years

Socio-demographic characteristics	n=338	Percentage
Age (in years) Mean 17.1, SD 1.0 (Min 15 & Max 19)		
Study sites		
School A	180	53.3
School B	81	24.0
School C	77	22.8
Class		
XI	171	50.6
XII	167	49.4
Gender		
Male	200	59.2
Female	138	40.8
Marital Status		
Married	9	2.7
Unmarried	329	97.3
Ethnicity		
Dalits	3	0.89
Teraijanajatis	42	12.4
Religious minority	2	0.59
Privileged janajati	178	52.7
Brahmin/chettri/thakuri	113	33.4
Religion		
Hindu	311	92.0
Buddhist	20	5.9
Christian	6	1.8
Muslim	1	0.3
Numbers of brothers/sisters Mean 1.9, SD 1.5 (Min 1 & Max 10)		
Educational status of father		
Illiterate	28	8.3
Read and write only	107	31.7
Formal education completed	203	60.0
Educational status of mother		
Illiterate	105	31.1
Read and write only	120	35.5
Formal education completed	113	33.4
Wealth index quintile		
Poor	113	33.4
Middle	114	33.7
Rich	111	32.9
Occupation of father		
Formal employment	137	40.5
Daily laborer	38	11.2
Self-employment/business	62	18.3
Farmer	92	27.2
Others	9	2.7
Occupation of mother		
Housewife	202	59.8
Formal employment	40	11.8
Daily laborer	9	2.7
Self-employment/business	20	5.9
Farmer	67	19.8
Living status		
Living with parents	255	75.4
Staying with relatives	17	5.0
Living with one parent(either father or mother)	18	5.3
Dormitory	5	1.5
Staying self in a rented place	39	11.5
Others	4	1.2
Family relationship		
Very distant	3	0.9
Somewhat distant	15	4.4
Neutral	76	22.5
Somewhat close	38	11.2
Very close	206	61.0

3.4. SRH Knowledge Characteristics

The students had a ASRH mean knowledge score of 55.3±24 on a scale of 0 to 100. This was calculated on the basis of answers to 20 items covering knowledge of ASRH service availability, sources of information, and ASRH service types. About 94% of the students ever heard of ASRH services. Among them, 93.7% knew services are available at a hospital or healthcare center. Major sources of information were school (79.6%), followed by television (69.3%), print media (67.1%), and radio (60.5%). Family (27.9%), trainings (27.9%), and youth clubs (17.6%) were the least common sources of information. Most (94.9%) participants are aware of family planning services, followed by HIV counseling services (70.6%), STI diagnosis and treatment (69.9%), and safe abortion services (64.6%). These results are summarized in Table 3.

Table 3. Distribution of knowledge related characteristics on SRH services among students aged 15-19 years

Knowledge related characteristics	Frequency (n=338)	Percentage
Ever heard of any SRH services		
Yes	319	94.4
No	19	5.6
Knowledge of availability of SRH services*		
Hospital/healthcare center	298	93.7
Medical shops/drug stores	143	45.0
I/NGOs	60	18.9
Adolescent and youth clubs	100	31.4
Sources of information*		
Radio	193	60.5
Television	221	69.3
Print media	214	67.1
Social network, websites, twitter, facebook, & blogs	129	40.4
Trainings	89	27.9
Friends and peer groups	150	47.0
Family	89	27.9
School education	254	79.6
Youth clubs	56	17.6
Knowledge of SRH services*		
Family planning services	300	94.9
HIV counselling services	223	70.6
STI diagnosis and treatment	221	69.9
Care of young pregnant mothers	139	44.0
Safe abortion services	204	64.6
General healthcare and checkups	141	44.6
Emergency care services	164	51.9

*data obtained due to multiple response.

3.5. SRH Service Utilization

SRH service utilization was reported by 9.2% of students (Figure 1). Service utilization proportion was lower among females (4.3%) than males (12.5%) (95%). One in four (25.8%) of students who utilized services had done so within the last three months.5. Among those who utilized SRH services within 12 months (n=22), the mean number of times service was utilized was 2.6 (SD=1.4), with a range of one to six times. The most common person accompanying the service user was a boyfriend or girlfriend (38.7%), followed by no one (16.1%), a mother (12.9%), a father (9.7%), a spouse (9.7%), siblings (6.5%) and cousins (6.5%).

Table 4. Distribution of perceived SRH needs and service preferences related characteristics among students aged 15-19 years

Perceived SRH needs and service preferences	Frequency (n=338)	Percentage
Ever felt need of SRH health services		
Yes	50	14.8
No	288	85.2
Time of felt need		
One months ago	12	24.0
Three months ago	11	22.0
Six months ago	6	12.0
Twelve months ago	8	16.0
Unable to remember	13	26.0
Response after felt need of SRH services		
Did nothing	1	2.0
Used services	13	26.0
Talked with parents	3	6.0
Talked with friends	5	10.0
Communicated with girlfriend/boy friend	15	30.0
Discussed with adolescent/youth groups	8	16.0
Others	5	10.0
Plan to utilize SRH services in future		
Yes	125	37.0
No	213	63.0
Views on SRH problems to the students*#		
Menstrual problems	264	79.0
Masturbation related problems	169	50.6
Genital organs pain	154	46.1
Psycho sexual problems	171	51.2
Sexual and gender based violence	123	36.8
STI related problems	77	23.1
Unintended pregnancy	76	22.8
Abortion related problems	55	16.5
SRH services preferences*		
Information on menstrual problems	183	54.8
Information on masturbation	162	48.5
Information on physical changes	183	54.8
Information on physical relationships	183	54.8
STI counselling	178	53.3
STI diagnosis	144	43.1
Family planning counselling	119	35.6
Contraceptive distribution	91	27.2
Safe abortion services	94	28.1
Emergency contraceptive distribution	82	24.6
Post abortion care services	69	20.7
Convenient day and time preferences		
During school/study time	126	37.3
During non-official hours	39	11.5
During holiday(Friday or Saturday)	165	48.8
Others	8	2.4
Preference for the place		
Anywhere	11	3.3
With other health services in the clinic	122	36.1
In a clinic separate from other services	69	20.4
In the clinic but in a different room	56	16.6
Available within school	80	23.7
SRH Service provider preference		
Male service provider	62	18.3
Female service provider	86	25.4
Young male service provider	31	9.2
Young female service provider	25	7.4
Elder male service provider	16	4.7
Elder female service provider	20	5.9
Any service provider	93	27.5
Others	5	1.6

*data obtained due to multiple response

#responses from both males and females.

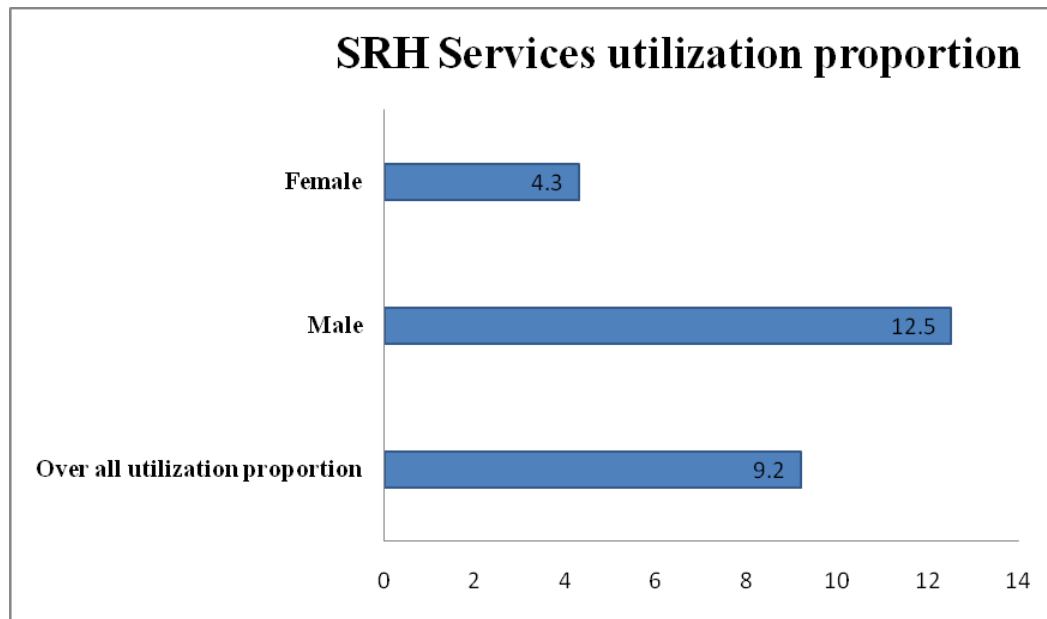


Figure 1. Proportion of students aged 15-19 years ever utilized of any SRH services

The students who had used ASRH services were asked about their most recent utilization. About one-third (32.3%) had obtained emergency contraceptive pills; 29.0% used general ASRH counseling services; 25.8% used family planning services; 9.7% sought STI diagnosis and treatment; and 3.2% received HIV counseling.

3.6. Factors Associated with SRH Service Utilization among Students aged 15-19 Years

A majority of the participants (71%) said the lack of confidential services was a significant barrier to utilization of SRH services. Similarly, 30% believed available services were inadequate to meet their SRH needs.

With the aim of identifying the factors associated with ever service utilization, bivariate analysis was carried out. In the bivariate analysis, gender was found to be associated with service utilization. Males were three times more likely than females to utilize SRH services (Crude OR:3.14). Being married also influenced SRH service utilization. A married person was six times more likely to utilize ASRH services than unmarried persons (Crude OR:6.51). Other predisposing factors such as the ethnicity, religion, number of siblings and parents' educational status seem to have no statistically significant association with ASRH service utilization (Table 5).

The enabling factors such as residential status, ever hearing of adolescent friendly services, and ASRH knowledge were found to be statistically significant factors for service utilization.

Ability to access services also heavily influenced utilization. Students at schools that provided SRH services within the emergency health services department were seven times more likely to utilize SRH services (Crude OR:7.22). A shorter distance to a healthcare facility was also found to be significantly associated with SRH service utilization (Crude OR: 4.7). Sexual behavior was associated with increased odds of service utilization with those being sexually active or those having sexual relation in past 12 months 14 times more likely to utilize services than non-sexually active counterparts (Crude OR:6.57).

Both perceived needs and perceived barriers were found to be associated with SRH service utilization.

3.7. Multivariate Analysis of the Associated Factors

In multivariate analysis, the coefficient of determination was $R^2=0.699$. Thus, around 70% of the ASRH service utilization variation is explained by study variables.

In the multivariate analysis (Table 5), no predisposing factors (such as gender or marital status) were found to be associated with service utilization. Gender, though found to be associated with ASRH service utilization in bivariate analysis, was insignificant in the multivariate analysis. Of the enabling factors, students who went to schools that offered ASRH services within their emergency health services were almost 15 times more likely to utilize the services (Adjusted OR: 14.85). Distance from health facility (Adjusted OR: 12.80) and sexual activity within 12 months (Adjusted OR: 10.31) were also independent factors in ASRH service utilization. Counter intuitively, service utilization and perception of barriers to health services directly correlated (Adjusted OR: 7.05).

3.8. Perceived SRH Needs and Service Preferences

The survey also recorded information on all participants' perceived needs and preferences for ASRH services. We report these without reference to participants' characteristics, behavior, and prior service utilization.

Fifteen percent had ever felt a need for ASRH services, compared to 9.2% who utilized services. Among those who perceived a need, 26.0% were unable to remember the time of the felt need of services, 24.0% felt the need within the last month, and 22.0% during the last three months. After feeling the need for services, 30.0% communicated with a girlfriend or boyfriend, and 26.0% of those who perceived the need actually utilized services (Table 4).

Table 5. Factors associated with ever utilization of any SRH services

Variables (n=338)	Crude OR	P value	Adjusted OR	P value
	95% CI		95% CI	
Age (in years) (Mean± SD) 17.1±1.0	1.12(0.78-1.62)	0.532		
Gender				
Male	3.14(1.25-7.88)	0.011	1.49(0.379-5.816)	0.570
Female	1		1	
Marital Status				
Married	6.51(1.47-28.51)	0.000[#]	3.59(0.296-43.538)	0.315 [#]
Unmarried	1		1	
Ethnicity				
Brahmin/Chhetry/Thakuri	0.42(0.15-1.15)	0.092		
Dalit's/Religious minority and TeraiJanajatis	1.78(0.721-4.38)	0.211		
Privileged Janajati	1			
Religion				
Buddhist/Christian/Muslim	1.26(0.36-4.46)	0.716 [#]		
Hindu	1			
Numbers of brothers/sisters^a (Mean± SD) 1.9 ± 1.5				
>2	1.14(0.49-2.65)	0.769		
≤2	1			
Educational status of father				
Illiterate	2.38(0.833-6.77)	0.106		
Literate	1			
Educational status of mother				
Illiterate	1.45(0.68-3.12)	0.337		
Literate	1			
Occupation of father				
Formal employment	0.81(0.37-1.75)	0.584		
Self-employment/business	0.26(0.06-1.15)	0.076 [#]		
Daily laborer /farmer/others	1			
Occupation of mother				
Housewife	1.10(0.39-3.13)	0.856		
Farmer	2.25(0.724-6.96)	0.161		
Formal and self-employment/ daily laborer/business	1			
Wealth index quintile				
Poor	3.00(1.21-7.46)	0.018	2.99(0.762-11.71)	0.116
Middle	0.68(0.21-2.22)	0.524	0.61(0.110-3.34)	0.565
Rich	1			
Living status				
Living with other than parents	4.82(2.24-10.37)	0.000	3.45(0.983-12.17)	0.053
Living with parent(s)	1		1	
Family relationship				
Distant	1.4(0.30-6.53)	0.603 [#]		
Neutral	1.5(0.65-3.46)			
Close	1			
Heard of SRH services				
Yes	0.85(0.187-3.863)	0.833 [#]		
No	1			
Heard of adolescent friendly services				
Yes	14.5 (4.13-50.85)	0.000	2.80(0.25-31.35)	0.403
No	1		1	
Heard of sexual relationship				
Yes	3.31(1.13-9.71)	0.029[#]	0.83(0.182-3.826)	0.815 [#]
No	1		1	
School SRH education				
Yes	0.49(0.225-1.047)	0.065		
No	1			
SRH services within emergency health services in school				
Yes	7.22(2.98-17.48)	0.000	14.85(2.86-77.08)	0.001
No	1		1	
Distance from home to nearest healthfacility^a				
≤2 Kilometers	4.7(2.09-10.58)	0.000	12.80(3.10-52.79)	0.000
>2 Kilometers	1		1	
Sexually active within 12 months				
Yes	14.99(6.57-34.22)	0.000	10.31(2.59-41.12)	0.001
No	1		1	
Ever need of SRH services				
Yes	4.5(2.01-9.94)	0.000	2.51(0.72-8.75)	0.150
No	1		1	
Perceived barriers				
Yes	11.06(4.91-24.92)	0.000	7.05(2.32-21.44)	0.001
No	1		1	

[#]Fisher exact test was done

1=Reference category

OR: Odds Ratio; CI: Confidence Interval

^aMean values were used

Adjusted for ethnicity, religion, numbers of brothers/sisters, educational status of father, educational status of mother, occupation of father, occupation of mother, family relationship, heard of SRH services and school SRH education

Almost 37.0% of students said they intended to utilize sexual and reproductive health services in the future.

334 students answered questions on their views on ASRH problems. Among them, menstrual problems (79.0%) were the most commonly reported problem; almost 60% of females responded that it is a common problem among students. About half (51.2%) of students reported psycho-sexual problems; among them, 69.0% of males endorsed this answer. About half (50.6%) reported perceived problems with masturbation, and most of these (84.6%) were males. Consistent with these problems, information on menstrual problems (54.8%), information on adolescent physical changes (54.8%), information on intimate relationships (54.8%), STI counseling (53.3%), and information on masturbation (48.5%) are major perceived needs of the students (Table 4).

Half of the students said they preferred ASRH services on Friday or Saturday (off hours), in a setting with other health services. Around one-third are comfortable with other health services in the clinic, and 26% of the students prefer to have ASRH services within their secondary school. With respect to provider preference, 27.5% of the students said they would be happy with any service provider, irrespective of age or gender.

4. Discussion

The main focus of this study was to determine the needs and utilization of available adolescent sexual and reproductive health services by adolescents aged 15-19 years. This study found that the overwhelming majority of adolescents were not utilizing SRH services, even after initiation of an adolescent-friendly health service program in their district. ASRH utilization in this sample was lower than that of adolescents studied in Vanuatu (12.6%) [28], Ethiopia (21.5%) [29], and Tanzania (75%) [30].

In the present study, there was a gap between those who felt the need of SRH services (15%) and those who utilized services (9.2%). This indicates that barriers stopped 5.8% of all respondents (n =19) from utilizing services they felt they needed.

Lack of confidentiality was described as a barrier to SRH service utilization in this study and many others [3,14,28,31]. Our findings suggest a need to reinforce the rights of the adolescents to confidential SRH services sensitive to local culture and religion.

Around 30 percent of students described available services as inadequate. There was no clear consensus on preferences of adolescents on ASRH services and places of services. There is a need to understand the heterogeneity of adolescents and use a variety of options, strategies, or guidelines to provide them with accessible services [10].

Perceived barriers are more commonly reported among those who had ever utilized the services. For the 9.2% of participants who had utilized services, the perceived barrier could relate an unsatisfactory quality in their experience of ASRH services. This is a concern for service continuity and expansion of care to more adolescents.

The distance to health facilities was also identified as a barrier to service utilization. Other studies have shown that longer distance to facilities undermines service

utilization [31]. The study revealed that the closer the services, the greater the utilization. This supported extending the adolescent health services to nearby locations. A future study that classifies participants by the distance they must travel to access adolescent-friendly health services in Bhaktapur could further illuminate how distance impedes access.

Those students in schools with ASRH services within health services were 15-fold more likely to utilize the health services. One-fourth of participants expressed preference for SRH services within the school. The WHO recommends that ASRH services be integrated into school health services, at the adolescent's first point of contact [3,31]. Additionally, gender-sensitive services with female providers may be necessary to improving utilization among adolescent females, as they were less likely to utilize services.

Around 12 percent of the adolescents were found to be sexually active within the last 12 month. This was consistent with another study [13]. However, behavior may have been downplayed because of the socio-cultural context, where premarital sex is taboo [32].

Further, it is useful to examine students' decisions to utilize ASRH services via their social networks. In other contexts, social network mapping has been used to trace infectious disease outbreaks [33], health decision-making [34], and even emotions [35,36]. This process involves identify participants' social connections and quantifying the level of influence of various kinds of contacts (i.e., friends, classmates, or romantic partners). In general, adolescence is a time when individuals place a particular importance on social relationships, and in our study, many participants said they favored relying on peers or romantic partners for ASRH information and companionship during service utilization. Understanding how various contacts influence students' sexual and reproductive decision-making is therefore important to increasing service utilization. This method can be used for mapping how the decision to seek SRH services might spread across a group of adolescents in response to the implementation of health promotion programs or increased service availability.

Finally, because so few adolescents are utilizing SRH services, Positive Deviance methods may be useful for designing effective health promotion approaches. Positive Deviance relies on identifying the few individuals who are exhibiting an unusually health behavior (a "positive deviation" from the norm), identifying key differences in their thinking or behavior, and then promoting these differences to others in their peer group. This method allows for realistic changes, positive peer pressure, and heightened perception among the target population that a change is attainable and worthwhile [37].

Since this study was carried out in the urban government higher secondary schools, the unavailability of the adolescent-friendly health services (AFHS) in urban clinics of Bhaktapur district may be one of the reasons for lower ASRH service utilization. The National Health Sector Programme (NHSP II) calls for establishing AFHS in 1,000 health facilities by 2015 [17], including Bhaktapur. AFHS can be integrated into urban clinics (as most higher secondary schools are urban). Because Bhaktapur district will have AFHS, this study serves as a baseline for a future study of the effectiveness of newly implemented AFHS in the district. Further studies on the

barriers to providing SRH services from providers' perspective are also recommended.

4.1. Limitations

This study has shared the limitations of cross-sectional studies, i.e. the difficulty of determining causal relationships between variables. As this study required participants to remember information retrospectively, recall bias is another potential limitation. Additionally, a wish to downplay taboo behavior may have altered reports of sexual activity. The quantitative study design did not allow for probing into certain areas which needed further qualitative description. Finally, the study was conducted only in three government intermediate schools, which means the findings may not be generalizable to the overall Nepali adolescent population, who are educationally, socioeconomically, linguistically, and ethnically diverse.

5. Conclusions

This descriptive study on an adolescent population in Nepal reveals a very low level of service utilization as well as several barriers. Limited access to confidential SRH counseling and services and inadequate services was identified as the key barriers to SRH service utilization. It serves as a notice that changes are necessary to meet current and future needs in this demographic.

This study also functions as a baseline descriptive study. Future surveys of adolescent groups will document the impact of increased services. Studies exploring the modality and feasibility of integrating the SRH services in school health services could be helpful in improving the utilization of SRH services among the adolescent's students.

Competing Interests

The authors declare that they have no competing interests.

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