development goals [4]. Effective contraception use among youth is predicted to lower unexpected pregnancies by 59%, unplanned births by 62%, abortion by 57% and abortion of undesired pregnancies by 71% [5]. Additionally, it is possible to prevent close to 32% of maternal deaths, 90% of abortion related deaths and 20% of pregnancy related morbidity and mortality. Although there are now many different types of modern contraceptive products, there is underutilization of these products especially among the youth even in nations where it is widely available and free. Thus, to achieve this goal, there is a need to understand the factors influencing the utilization of modern contraceptive methods.

Studies in West Africa and Bangladesh indicate that youth in rural areas had significantly lower utilization of modern contraception than youth in urban areas [6,7]. Despite improvements in SRH access in East African countries including Uganda, there are still significant gaps in the SRH service availability, utilization and quality, and there remains a significant unmet need for contraception, especially among the youth [8]. There is limited information on modern contraceptive use among youth in rural settings in Uganda. Most of the available literature is on women in general and mostly in urban areas [9]. There is a need for youth focused studies in a rural setting to formulate evidence based policies to enhance the utilization of modern contraceptives. Therefore, this study assessed the factors influencing the utilization of modern contraceptive methods among rural youth in Northern Uganda.

Materials and Methods

Study area and setting

The study was conducted in Lira district, located in the Northern region of Uganda. It is the main administrative and commercial center of Lango sub region. According to projections of 2020 by the Uganda bureau of Statistics (UboS) based on the 2014 population census, the district had approximately 474,200 people with predominantly the Lango tribe. It has two divisions, East and West with each division comprising wards and cells. The district consists of many health facilities including Ogur health centre IV and Amach health centre IV, among other health centres IIIs IIs, and private health facilities, clinics, and drug shops providing reproductive health services.

Study design

The study adopted a community based cross sectional design using quantitative approaches to data collection and analysis. It was conducted between August and November 2022 in Lira district. The cross sectional design was used because it allows assessment of cause and effect at a single point in time.

Study participants and sample selection

The study was conducted among young people. Youths were defined as any boy or girl from 15 to 24 years. According to the national health statistics, people aged 15 to 24 years have a disproportionate burden of sexual and reproductive health risks and are therefore a key population [10]. The sample size for the study was determined using the Kish Leslie formula for cross sectional studies [11]. Given that no recent study has been conducted to ascertain the level of modern contraceptive use among this group, a proportion (p) of 50% was used to obtain the maximum sample size. A-Z value of 1.96 and an error margin (d) of 5% were used in the calculation. Given that cluster sampling was used, a design effect of 1.5 was based on similarly conducted studies.

$$n = 1.5 * Z^2 * p(1-p)/d^2$$

$$n = 1.5 * 1.96^2 * 0.5(1-0.5)/0.05^2$$

$$n = 577 \text{ Participants}$$

Sampling criteria

Respondents were selected using multistage random sampling procedure with clustering at the divisions. The district is divided into East and South constituencies all of which were involved for representativeness. Both divisions, east and west were used for representativeness. From each constituency 2 wards were selected and from each ward 2 cells were selected using a simple random sampling procedure. Households were selected consecutively with the help of the local council one for each of the participating cells. All households with young people aged 15 to 24 years were approached with one person selected from each household, for those that had more than one young person.

Data collection and analysis

Data was collected using structured interviewer administered questionnaires. The questionnaire was designed based on literature from similar studies, prepared in English and then translated to luo, the native language used in the study area [12,13]. The questionnaire was pretested among 57 randomly selected young people from Aber Sub County in Oyam district. The dependent variable for the study was the utilization of modern contraceptives use among young people (15 to 24 years), measured as a binary outcome of yes or no for those who had used any of the modern contraceptive methods or not. The methods include injectables, implants, sterilization, Intrauterine Devices (IUDs), condoms, spermicides, diaphragms and cervical caps. The independent variables include the socio demographic characteristics of respondents and hindrances in the utilization of modern contraceptive methods from the health facilities available. Five research assistants with at least a diploma in social sciences or related fields were recruited and trained in the study and data collection. Data collected was entered in to Microsoft Excel worksheet software and thereafter cleaned. The data was then exported to STATA version 17 for subsequent analysis. Descriptive statistics were used to summarize the data collected. Bivariate analysis was done by running the Pearson *chi-square* at 95% confidence intervals. Significant variables were considered at a p-value of 0.05; these were considered for multivariate analysis. At multivariate analysis, prevalence ratios with a 95% confidence interval were reported through a

modified Poisson regression model with robust variance estimation. Odds ratios could not be used as estimates because they would overestimate the effect due to the high prevalence (36%) of the primary outcome. Variables with $p \leq 0.05$ was considered to be statistically significant with the outcome variable.

Results

Sociodemographic characteristics of young adults

A total of 533 out of the 577 respondents fully answered the questions generating a response rate of 92.4%. Respondents had a mean age of 17.6 (± 2.4) years. The majorities were females 345 (64.7%) and had attained secondary education 232 (43.5%). Only 96 (18%) of the respondents reported that were in a marital relationship and 155 (29.1%) lived in rural areas, 359 (67.3%) were living with their parents, 361 (67.7%) were students and 215 (40.3%) were Anglicans. Also, results show that 192 (36%) were utilizing modern contraceptives, more than a quarter 175 (32.8%) faced sexual and reproductive health challenges and 333 (62.5%) did not have enough privacy at the health facilities (Table 1).

Table 1: Characteristics regarding modern contraceptive service utilization among young people in city, 2022.

Characteristic	Category	Frequency (N)	Percentage (%)
Age	15-17	292	54.8
	18-19	179	33.6
	20-24	62	11.6
Gender	Female	345	64.7
	Male	188	35.3
Education	None	52	9.8
	Primary	200	37.5
	Secondary	232	43.5
	Tertiary	49	9.2
Engaged in a sexual relationship	No	437	82
	Yes	96	18
Mothers education	None	114	21.4
	Primary	207	38.8
	Secondary	154	28.9
	Tertiary	58	10.9
Fathers education	None	56	10.5
	Primary	135	25.3
	Secondary	177	33.2
	Tertiary	165	40
Residence	Rural	155	29.1
	Urban	378	70.9
Religion	Anglican	215	40.3

	Catholic	201	37.7
	Muslim	62	11.6
	Other	55	10.3
Living with parents	No	174	32.7
	Yes	359	67.3
Employment	Formal employed	19	3.6
	Self-employed	69	13
	Student	361	67.7
	Unemployed	84	15.8
Faced SRH challenges	No	358	67.2
	Yes	175	32.8
No staff of same gender	No	448	84.1
	Yes	85	15.9
Mistreated by staff	No	338	63.4
	Yes	195	36.6
Not enough privacy	No	200	37.5
	Yes	333	62.5
Fear embarrassment	No	324	60.8
	Yes	209	39.2
Difficult to get to the health facility	No	409	76.6
	Yes	124	23.3
Long waiting time	No	462	86.7
	Yes	71	13.3

Factors associated with the utilization of modern contraceptive methods

From the bivariate analysis in Table 2, the age of the respondent (X^2=108.648; p<0.001), education level (X^2=56.765; p<0.001), marital relationship (X^2=151.475; p<0.001), parents education (X^2=21.457; p<0.001), residence (X^2=13.025; p<0.001), religion (X^2=9.025; p=0.03), living with parents (X^2=153.174; p<0.001), employment status (X^2=125.194; p<0.001), faced SRH challenges (X^2=124.014; p<0.001), mistreated by hospital staff (X^2=15.117; p<0.001) and difficulty in reaching the health facility (X^2=3.971; p=0.05)were associated with utilization of modern contraceptive methods.

Table 2: Bivariate analysis for modern contraceptive service utilization among young people in city, 2022.

Characteristic	**MCM utilization**		**X^2**	**P value**
	No n=341 (64%)	**Yes n=192 (36%)**		

Age				
15-17	243 (71.3)	49 (25.5)	108.648	<0.001*
18-19	80 (23.5)	99 (51.6)		
20-24	18 (5.3)	44 (22.9)		
Gender				
Female	219 (64.2)	126 (65.6)	0.106	0.75
Male	122 (35.8)	66 (34.4)		
Education				
None	19 (5.6)	33 (17.2)	56.765	<0.001*
Primary	155 (45.5)	45 (23.4)		
Secondary	152 (44.6)	80 (41.7)		
Tertiary	15 (4.4)	34 (17.7)		
Engaged in a sexual relationship				
No	332 (97.4)	105 (54.7)	151.475	<0.001*
Yes	9 (2.6)	87 (45.3)		
Mothers education				
None	74 (21.7)	40 (20.8)	21.457	<0.001*
Primary	110 (32.3)	97 (50.5)		
Secondary	118 (34.6)	36 (18.8)		
Tertiary	39 (11.4)	19 (9.9)		
Fathers education				
None	35 (10.3)	21 (10.9)	16.446	0.001*
Primary	71 (20.8)	64 (33.3)		
Secondary	132 (38.7)	45 (23.4)		
Tertiary	103 (30.2)	62 (32.3)		
Residence				
Rural	81 (23.8)	74 (38.5)	13.025	<0.001*
Urban	260 (76.3)	118 (61.5)		
Religion				
Anglican	139 (40.8)	76 (39.6)	9.025	0.03*
Catholic	127 (37.2)	74 (38.5)		

Muslim	32 (9.4)	30 (15.6)		
Other	43 (12.6)	12 (6.3)		
Living with parents				
No	47 (13.8)	127 (66.2)	153.174	<0.001*
Yes	294 (86.2)	65 (33.8)		
Faced SRH challenges				
No	287 (84.2)	71(37.0)	124.014	<0.001*
Yes	54 (15.8)	121(63.0)		
No staff of same gender				
No	294 (86.2)	154 (80.2)	3.309	0.07
Yes	47 (13.8)	38 (19.8)		
Mistreated by staff				
No	237(69.5)	101 (52.6)	15.117	<0.001*
Yes	104(30.5)	91 (47.4)		
Not enough privacy				
No	124 (36.4)	76 (39.6)	0.543	0.46
Yes	217 (63.6)	116 (60.4)		
Fear embarrassment				
No	217 (63.6)	107 (55.7)	3.222	0.07
Yes	124 (36.4)	85 (44.3)		
Difficult to get to the health facility				
No	271 (79.5)	138 (71.9)	3.971	0.05*
Yes	70 (20.5)	54 (28.1)		
Long waiting time				
No	301 (88.3)	161 (83.9)	2.074	0.15
Yes	40 (11.7)	31 (16.2)		
NOTE: X^2: *Chi-square* value; *significant variable (P ≤ 0.05)				

Predictors of utilization of modern contraceptive methods

Table 3 shows that being aged 18 to 19 years (APR: 1.20; 95% CI: 1.09-1.42; p=0.03), living with parents (APR: 0.79; 95% CI: 0.66-0.93, p=0.006) and facing MCM challenges (APR: 1.22; 95% CI: 1.04-1.44, p=0.02) had statistically significant association with utilization of MCM. Young people aged 18 to 19 years were 1.2 times more likely to utilize SRH services compared to their counterparts below 18 years. Young people living with their parents were less likely to utilize MCMs compared to those living alone. Those who faced MCMs challenges were 1.22 times more likely to utilize MCM services compared to those who did not face challenges.

Table 3: Multivariate analysis for modern contraceptive service utilization among young people in Lira city, 2022.

Factor	MCM utilization		Crude PR (95% CI)	Adjusted PR (95% CI)	P value
	No n (%)	Yes n (%)			
Age					
15-17	243 (71.3)	49 (25.5)	Ref		
18-19	80 (23.5)	99 (51.6)	1.32 (1.14-1.56)***	1.20 (1.09-1.42)	0.03
20-24	18 (5.3)	44 (22.9)	1.46 (1.18-1.82)**	1.17 (0.92-1.48)	0.21
Education					
Living with parents					
No	47 (13.8)	127 (66.2)	Ref		
Yes	294 (86.2)	65 (33.8)	0.68 (0.59-0.79)***	0.79 (0.66-0.93)	0.006
Faced MCM challenges					
No	287 (84.2)	71 (37.0)	Ref		
Yes	54 (15.8)	121 (63.0)	1.41 (1.22-1.64)***	1.22 (1.04-1.44)	0.02

NOTE: PR: Prevalence Risk ratio; *** p<0.01, ** p<0.05, * p<0.1; CI: Confidence Interval

Discussion

In our study, we assessed the factors influencing the utilizing modern contraceptive methods among the youth aged 15 to 24. We found the overall utilizing modern methods among young adults aged 175 (32.8%). Our results show that being aged 18 to 19 years (APR: 1.20; 95% CI: 1.09-1.42; p=0.03), living with parents (APR: 0.79; 95% CI: 0.66-0.93, p=0.006), and facing sexual reproductive health problems (APR: 1.22; 95% CI: 1.04-1.44, p=0.02) had statistically significant association with utilization of MCM. This low level of utilization suggests that the use of modern contraceptives for fertility prevention is still a problem among youth in rural northern Uganda. Our finding resonates with that of Yaha and colleagues who reported low contraceptive use in many Sub-Saharan African countries [14]. However, the 32.8% observed in this study is higher than the 18.0% reported in Ghana and 19.0% in Congo [15]. This discrepancy might be because of the elapsed study period and the small sample size in the previous studies.

Our results show that youth aged 18 to 19 years were 1.2 times more likely to utilize MCM services compared to their counterparts below 18 years. The lower contraceptive use might be because youth aged below 18 years are still in school and due to that might not want to have children to disrupt their education [16]. Additionally, youth aged 18 to 19 years are highly sexually active, thus, utilizing modern contraception to avoid unintended pregnancies [17]. Our results are in line with findings of other studies showing that age was associated with modern contraceptive use [18, 19].

Those who faced sexual reproductive health problems were 1.22 times more likely to utilize MCM services compared to those who did not face challenges. In this study, the challenges faced included Sexually Transmitted diseases (STIs), unintended pregnancy, and abortion. The results suggest the youth became aware that some modern contraceptive methods help to prevent the transmission of STIs [20]. Also, the youth may have realized after facing such challenges that modern contraceptive methods have clear benefits including the prevention of unwanted pregnancies and abortion

Conclusion

The present study found a relatively low utilization of modern contraceptive methods among the youth in rural Northern Uganda and the associated factors were age, living with parents and facing sexual reproductive health problems. There is a need to further enlighten the youth in rural areas on the need to utilize modern contraceptive methods.

Strengths and limitations

The study's sample size is large enough and therefore the results may be generalized to other similar populations. Secondly, this study was conducted in a rural setting adding to the limited literature in such settings. This study however has its limitations: The data is based on a cross sectional sample and may not be representative of all the youth rural areas in Uganda. Also, data collection was conducted in private locations and

participants were assured of confidentiality, self-reported tools were used to collect data which could have produced social desirability biases in responses.

Ethical Approval

The study was approved by the Gulu University Research and Ethics Committee (GUREC-2022-329). Introductory letters from Lira university were taken to the District Health Officer (DHO) who approved the study to be conducted in Lira district. An informed consent form was administered before data collection to all respondents 18 years and above and assent forms and consent forms for parents and children aged 15 to 17 years respectively.

Data Sharing Statement

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

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Authors' contribution

All authors made significant contribution to the work reported, whether that is in the conception, study design, reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agreed to be accountable for all aspects of the work.

Conflict of Interest

Authors have no conflict of interest.

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