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Knowledge and use of emergency contraceptive methods and associated factors among female youth college students in Gondar city, Northwest Ethiopia, 2023

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Abstract

Background Proper use of emergency contraception can reduce unintended pregnancy and the risk of abortion. Despite this fact, there is a high rate of unwanted pregnancies among adolescents in Ethiopia. Therefore, determining the level of knowledge and use of Emergency contraceptives (EC) among female youth is important.

Objective To assess Knowledge and use of EC methods and their associated factors among female college students in Gondar City, Northwest Ethiopia, 2023.

Methods Institution-based cross-sectional study was employed among 814 female college students in Gondar City from April 15 to 28, 2023. A multi-stage sampling technique was applied to select the study participants. A self-administered questionnaire was used to collect the data. Epi-data version 4.6 and STATA Version 16, respectively, were used for data entry and analysis. A logistic regression model was fitted to identify factors associated with the outcome variables. Statistical significance was defined at a *p*-value < 0.05 and a corresponding 95% confidence interval.

Result In this study, 46.2% [95% CI (42.78, 49.63%)] of the participants had adequate knowledge about EC and 26.1% [95% CI (22.82–29.74%)] of sexually active participants used EC. Muslim religion [AOR = 1.82: 95% CI (1.07, 3.09)], being single [AOR = 0.34: 95% CI (0.19, 0.63)], no discussion about reproductive health issues with their husband/partner [AOR = 0.43: 95% CI (0.27, 0.69)], year of study; second year [AOR = 1.63: 95% CI (1.03, 2.58)], third year [AOR = 1.80: 95% CI (1.11, 2.94)], and fourth-year students [AOR = 2.91: 95% CI (1.43, 5.96)] were significantly associated with knowledge about EC. While no discussion about reproductive health with their husband/partner [AOR = 0.09: 95% CI (0.04, 0.20)], monthly allowance [AOR = 3.03: 95% CI (1.54, 5.95)], perceive use emergency contraceptives as not a sin [AOR = 2.59: 95% CI (1.20, 5.60], knowledge about EC [AOR = 2.32: 95% CI (1.253, 4.29)] were associated with the use of EC.

Conclusions Participants' knowledge and of use EC in the study area was low. Religion, years of study, marital status, monthly allowance, perception and knowledge, and having discussion were associated with the use of EC.

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School-based health education, and behavioral change communication interventions should be established and/or strengthened to address students in need of EC services.

Keywords Emergency contraceptive, Knowledge, Use, Gondar city, Ethiopia

Introduction

Emergency contraception (EC) refers to methods used to prevent pregnancy after having unprotected intercourse, concerns about possible contraceptive failure, incorrect use of contraceptives, and sexual assault without contraception coverage [1]. Emergency contraceptives should be used within five days of the act of intercourse; they are more effective when used earlier [2]. The proper use of emergency contraception can reduce the occurrence of unintended pregnancy and the risk of abortion [3, 4]. When used within 72 h of sexual contact, pills and intrauterine contraceptive devices (IUCDs) can prevent pregnancy by 75–85% and up to 99% respectively. These are highly preferred by many young couples who choose not to use long-term regular contraceptive methods due to erratic and irregular sexual behavior [5–7].

In low and middle-income countries (LMICs), about 74 million unintended pregnancies lead to 25 million unsafe abortions and 47,000 maternal deaths every year [8]. In Africa, unsafe abortion complications are responsible for nearly half of all maternal deaths [9]. Unwanted pregnancies and their complications are the major public health concern in Sub-Saharan Africa including Ethiopia [10, 11] where one-fourth of maternal deaths in Ethiopia are due to unsafe abortion [12]. In Ethiopia, the rate of unintended pregnancy ranges from 13.7 to 41.5 per 1000 reproductive-age women [13, 14]. Evidence shows that awareness and utilization of contraceptives to prevent unintended pregnancy have improved over time [15–18].

The government of Ethiopia has taken several measures to address the health needs of adolescents and youth including the implementation of the Youth Policy, the Health Sector Development Program I-IV, the Health Sector Transformation Plan I-II, the National Adolescent and Youth Reproductive Health Strategy (AYRH) in 2006, and the Adolescent and Youth Health Strategy 2016–2020, among other initiatives. As a result, improvements have been made in youth-responsive health facilities, adolescent and youth awareness, utilization of health services, and reduced unsafe abortion and related complications [19]. However, adolescents and youth in Ethiopia are still facing multiple challenges, including emerging health threats and preventable causes of morbidity and mortality. The country must build on the progress made, and move ahead understanding and overcoming challenges and making full use of opportunities [20, 21]. In Ethiopia, about 41.62% of college and university students had risky sexual behaviors [22]. A high number (51 per 1000 women) of female students at higher education institutions in Ethiopia also experience abortion [23]. As a result, female students at higher institutions suffer from reproductive challenges and the grave consequences of unintended pregnancies [24].

In spite of the high risk of unintended pregnancy, the level of knowledge about emergency contraceptives is highly inconsistent and dynamic, ranging between 10.1 and 93.0% [25–27]. The use of emergency contraceptives is also affected by misinformation, lack of awareness, socio-demographic characteristics, level of knowledge, alcohol and drug use, affordability of EC, and others [16]. Understanding the level of EC to prevent unintended pregnancy, its consequences, and influencing factors has a pivotal role in planning, deciding, and implementing appropriate interventions. Hence, this study was aimed at assessing the knowledge, and utilization of emergency contraceptives among young female college students in Gondar city.

Methods and materials

Study area, design, and period

The study was carried out in the city of Gondar, which is 180 km from Bahir Dar, the capital of the Amhara regional state, and 720 km from Addis Ababa, the capital city of Ethiopia. An estimated two hundred and seven thousand (207, 044) people were living in Gondar, 102,487 of whom were men. There are eight public health centers, fourteen health posts, thirty-two private clinics, and one referral hospital in Gondar City. There are a total of nine, three government and six private, colleges in the city. After completing secondary or preparatory schools, students join diploma programs at colleges. In all, 8, 528 female students were enrolled in the colleges during the study period [28]. An institutional-based cross-sectional study was conducted at Gondar City, North West Ethiopia from April 15 to 28, 2023.

Population

All female youth college students (aged between 15 and 24 years old) in Gondar city were the source population whereas those students enrolled at selected colleges and who were actively attending their classes in Gondar city during the study period were the study population.

Inclusion and exclusion criteria

All youth female students aged 15–24 years, who were enrolled in the selected colleges in 2022/2023 academic year, resided in the study area for minimum of six months were included in this study. Females who were pregnant

during the study period, cannot communicate or not volunteer to participate were excluded from the study.

Sample size determination

The required sample size was calculated using a single population proportion formula by considering the following statistical assumptions: Margin of error of 5%, Z-value 1.96 corresponding to 95% CL, design effect of 2, and P-proportion of students utilized emergency contraception as 40.5% in Wolkite [29]. Accordingly, the sample size was computed as:

$$n = \frac{(Z\frac{\alpha}{2})^2 \times p \times q}{d^2}$$

$$= \frac{(1.96)^2 \times (0.405) \times (1 - 0.405)}{(0.05)^2} \approx 370$$

Multiplying it with a design effect of 2, and after adding 10% of the non-response rate the total sample size was estimated to be 814.

Sampling technique

A multi-stage sampling method was applied to select participants from both government and private colleges. First, colleges were stratified based on private versus government, then two from a total of six private colleges and one from a total of three government colleges in Gondar city were selected using a simple random sampling method (lottery method). Second, the number of study participants was further distributed into the year of study (batches) and departments. Then, probability proportional to population size allocation was applied for each batch and department. Finally, the participants were selected using simple random sampling.

Study variables

The dependent variables were the use of emergency contraception (yes/no) and knowledge about EC (adequate or inadequate) whereas the dependent variables included age, residence, religion, marital status, year of study, field of study, monthly allowance, chat chewing, alcohol drinking, father's education, mother's education, living with family, father's occupation, mother's occupation, age at first sex, discussion of reproductive health (RH) issues with husband, peer communication, and discussion of RH issues with parents, easy to get EC, fear of side effects of EC, sin to use EC, and EC causes infertility.

Operational definitions

Emergency contraception A kind of contraception indicated after unprotected sexual intercourse to prevent unintended pregnancy [30].

Utilization of EC if a female college student has a history of EC use [31, 32].

Knowledgeable Respondents who scored 50% and above on the knowledge assessment questions [32].

Peer communication The exchange of information, product reviews, and comments by the same age group about reproductive health issues [33].

Ever alcohol drinking was defined as a respondent who drinks alcoholic beverages (beer, wine, whiskey, areki, tela, tej, etc.) during her lifetime [34].

Current alcohol users students who drink alcoholic beverages (beer, wine, whiskey, areke, tela, tej, etc.) for non-medical purposes within the last three months [34, 35].

Ever chat chewer was defined as a respondent who chewed chat during his lifetime [34].

Current chat chewer a student who is chewing chat at the time of data collection [36].

Data collection procedures and materials

The data were collected using a structured self-administred questionnaire designed to assess knowledge and utilization of emergency contraceptives. The questionnaire was developed after reviewing related literature [15, 16, 20, 37, 38] and modified based on the context of this actual study. The questionnaire included the socio-demographic characteristics, family background and reproductive health-related issues, perception and knowledge-related features, access and utilization-related questions. Four bachelor's degree nurses and one midwife collected the data under the supervision of a master's degree student. Half-day training was given on the basic techniques of data collection and supervision. Study participants were gathered in silent rooms during class-free days. Then, questionnaires were administered after they gave informed consent.

Data quality control

To ensure the data quality, the data collection tool was reviewed by others working in the same area of study, and a pretest was done among 41 (5% sample size) female college students in Lay Armachiho (not part of the actual study) to identify the misunderstood items, and corrections were made to clarify unclear questions. The questionnaire was prepared in English and then translated into Amharic language (local language) and then back to English to assure its consistency. Trainings were given to data collectors and supervisors. The data collection process was closely supervised to maintain consistency and

completeness. Data was thoroughly cleaned before being analyzed.

Data processing and analysis

The collected data were entered into the computer using Epi-Data version 4.6 and exported to STATA version 16.0 for analysis. Descriptive statistical analysis was conducted, including the calculation of frequencies, percentages, and means. The results were presented using tables and graphs. Knowledge about Emergency contraception was assessed by eight questions, "adequate knowledge" was assigned to respondents who answered ≥ 50% of the questions correctly, and "inadequate knowledge" to those who answered < 50% of the questions correctly. Logistic regression analysis was employed to identify factors associated with knowledge and utilization of EC. Multicollinearity was diagnosed using the variance inflation factor (VIF). The result revealed that the multi-collinearity issue was not the concern, the VIF values were less than ten [10] for all tested variables. Bivariable analysis were employed to determine the relationship between the independent and the dependent variables. On bivariable analysis, variables with a *P*-value less than 0.25 were considered for multivariable analysis. Then *P*-value less than 0.05 and the adjusted odds ratio with their corresponding 95% CI in multivariable logistic regression analysis were considered to declare the significance and strength of association between variables.

Table 1 Socio-demographic characteristics of college female students, Gondar City, Northwest Ethiopia, 2023 ($n = 814$)

Variables	Category	Frequency	Percentage (%)
Age	15–19	191	23.46
	20–24	623	76.54
Residence	Urban	447	54.91
	Rural	367	45.09
Religion	Orthodox	606	74.45
	Muslim	162	19.90
	Protestant	37	4.55
	Catholic	9	1.11
Marital status	Single	713	87.59
	Married	94	11.55
	Divorced	7	0.86
Year of study	1st	282	34.64
	2nd	246	30.22
	3rd	210	25.55
	4th	78	9.58
Field of study	Health	238	29.24
	Non health	576	70.76
Monthly allowance	< 1500	455	55.90
	≥ 1500	359	44.10
Source of allowance	Parents	718	88.21
	Relatives	13	1.60
	Boyfriend/husband	83	10.20
Ever chew Chat	No	794	97.54
	Yes	20	2.46
Chewing now ($n = 20$)	No	13	65
	Yes	7	35
Ever drink alcohol	No	454	55.77
	Yes	360	44.23
Currently drinking alcohol ($n = 360$)	No	100	27.78
	Yes	260	72.22
Type of alcohol	Beer	142	39.44
	Wine	58	16.11
	Tela	150	41.67
	Areki	10	2.78

Results

Socio-demographic characteristics

A total of 814 female students participated. The age range of the study participants was from 16 to 24 with a mean age of 20.57 years (SD = 1.67). Over three-quarters (623, 76.5%) of the participants were aged between 20 and 24 years, over half (447, 54.9%) resided in rural areas and about three-quarters (606, 74.5%) were Orthodox religious followers. The majority of the participants, 713 (87.6%) were single, and more than one-third 282 (34.6%) were first-year students. About 576 (70.8%) and 455 (55.9%) were attending non-health science education and had less than 1500 Ethiopian birr (27.63 US dollars) monthly allowance respectively. Nearly all, 794 (97.5%) and more than half, 454 (55.8%) of the students never chewed chat and drank alcohol throughout their lifetime respectively (Table 1).

Family related characteristics

Regarding the students' families, about 360 (44.23%) of the students' fathers can read and write, while one-third 272 (33.4%) of the student's mothers cannot read and write. Three-fourths (75.9%) of the students were living separately from the family. Three hundred fifty (43%) and 623 (76.5%) of students' fathers and mothers were farmers and housewives respectively (Table 2).

Knowledge about emergency contraceptives

Seven hundred fifty-three (92.5%) of the respondents had ever heard about EC; among those who had ever heard of EC about 224 (29.8%) got the information from their friends followed by media 222 (29.48%). Three hundred fifty-seven (43.4%) of the respondents reported that EC should be taken within 72 h after unprotected sexual intercourse, while (312 (38.3%) and 379 (46.6%) of the respondents didn't know when IUCD should be used as EC after unprotected sex and the mechanism of action for EC respectively. Regarding the effectiveness, only

Table 2 Family-related characteristics of female college students, Gondar City, Northwest Ethiopia, 2023 ($n=814$)

Variable	Category	Frequency	Percentage (%)
Father education	Cannot read and write	196	24.08
	Can read and write	360	44.23
	1–8	112	13.76
	9–12	84	10.32
	College and above	62	7.62
Mother education	Cannot read and write	272	33.42
	Can read and write	263	32.31
	1–8	113	13.88
	9–12	80	9.83
	College and above	86	10.57
Lives with family	No	618	75.92
	Yes	196	24.08
Lives with whom ($n=618$)	Both mother and father	336	54.37
	Father only	9	1.46
	Mother only	28	4.53
	With relatives	156	25.24
	With my husband	61	9.87
	With my boyfriend	28	4.53
Father occupation	Farmer	350	43.00
	Government employer	97	11.92
	Private employed	255	31.33
	Merchant	112	13.76
Mother occupation	House wife	623	76.54
	Government employer	112	13.76
	Private employed	37	4.55
	Merchant	42	5.16

374 (46%) correctly knew that EC preventing unwanted pregnancy effectively, while more than four-fifths 668 (82.06%) knew EC cannot prevent STI/HIV (Table 3).

About 46.19%, 95% CI (42.78–49.63) of college female students had adequate knowledge about Emergency contraceptives (Fig. 1).

Reproductive health and emergency contraceptives utilization

More than three-fourths, 620 (76.2%) of the students had already started sexual intercourse. Out of these, 368 (59.4%) of them had their first sex between the age range of 14 and 19. Of sexually active students, 582 (93.9%) and 162 (26.1%) had exposure to unprotected sex and used EC respectively. Regarding the reason for not using EC, fear of side effects was mentioned by 194 (42.4%) of sexually active students. Of those who ever used EC, more than three-fourths, 127 (78.4%) reported that they have been utilizing EC regularly to prevent unwanted pregnancy. Among sexually active students, about one in

Table 3 Knowledge related responses of college female students, Gondar City, Northwest Ethiopia, 2023 ($n=814$)

Variable	Category	Frequency	Percentage (%)
Heard about EC	No	61	7.49
	Yes	753	92.51
Source of information	Media	222	29.48
	Health institution	88	11.69
	During education	218	28.95
	Friend	224	29.75
	Other	1	0.13
Which type of EC do you know?	Loop	261	32.06
	Injectable	99	12.16
	Pill	267	32.80
	Condom	26	3.19
	I don't know	161	19.78
When should be ECPs taken	Any time Before sex	122	14.99
	After unprotected sex Within 72 h	353	43.37
	After unprotected sex within 5 days	56	6.88
	Any time after sex	78	9.58
	I don't know	205	25.18
When should be IUCD used as EC after unprotected sex?	Within 120 h.	238	29.24
	After 120 h.	154	18.92
	Any time	110	13.51
	I don't know	312	38.33
Mechanism of action for EC	Prevent implantation	198	24.32
	Prevent ovulation	157	19.29
	Induce abortion	80	9.83
	I don't know	379	46.56
Situation/s in which EC should be taken to prevent unintended pregnancy	When forced to have sex	204	25.06
	When other methods have failed	51	6.27
	When there is sex without any contraceptives methods	162	19.90
	I don't know	397	48.77
Effectiveness of ECPs in preventing unwanted Pregnancy	100%	50	6.14
	75–85%	374	45.95
	50%	101	12.41
	< 30%	51	6.27
	I don't now	238	29.24
Does EC prevent STI/HIV?	No	668	82.06
	Yes	146	17.94

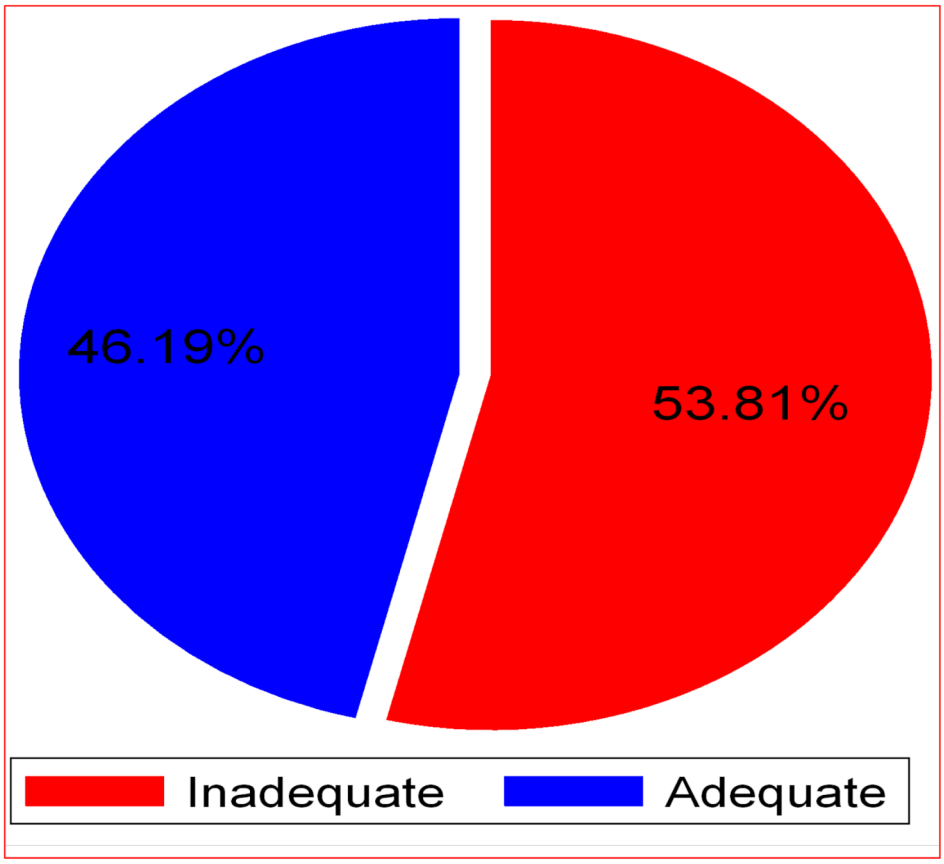

Fig. 1 Knowledge about EC among college female students in Gondar City, Northwest Ethiopia, 2023

ten (10.3%) had ever experienced pregnancy and almost all of these pregnancies (98.4%) were unplanned, and 56 (87.5%) were ended with induced abortions respectively. In all, (86.29%) of sexually engaged participants had never discussed RH issues with their husbands/partners. On the other hand, 593 (72.9%) of the students perceived that using EC is a sin (Table 4).

Only 26.13%, 95% CI (22.82–29.74%) of sexually active college female students had ever used emergency contraceptives (Fig. 2).

Factors associated with knowledge about emergency contraceptives

Variables with $p<0.25$ in bivariable regression were moved to the multivariable logistic regression model. Finally, the multivariable analysis revealed that being Muslim [AOR=1.82; 95% CI (1.07, 3.09)], being single [AOR=0.34: 95% CI (0.19, 0.63)], no discussion about reproductive health issues [AOR=0.43; 95% CI (0.27, 0.69], second year [AOR=1.63; 95% CI (1.03, 2.58)], third year [AOR=1.80; 95% CI (1.107, 2.94)], and fourth-year students [AOR=2.91, 95% CI (1.43, 5.96)] were significantly associated with knowledge about EC.

The finding revealed that Muslims were nearly two times more likely [AOR=1.82; 95% CI (1.07, 3.09)] to have adequate knowledge about EC as compared to Orthodox religious followers. In comparison to married female students, being single decreased the odds of having adequate knowledge of EC by 66% [AOR=0.34: 95% CI (0.188, 0.63)]. Similarly, those participants who had no discussion about reproductive health issues with their husbands had 57% reduced odds [AOR=0.43; 95% CI (0.27, 0.69)] of adequate knowledge regarding EC as compared to their counterparts. Additionally, our study showed that second, third, and fourth-year students were 1.63 [AOR=1.63; 95% CI (1.03, 2.58)], 1.8 [AOR=1.80; 95% CI (1.11, 2.94)], and 2.91 [AOR=2.91, 95% CI (1.43, 5.96)] times more likely, respectively, to have of adequate knowledge about EC as compared to first-year students, (Table 5).

Factors associated with utilization of emergency contraceptives

In multivariable analysis, not discussing about EC [AOR=0.09, 95% CI (0.037, 0.20)], monthly income greater than 1,500 ETB [AOR=3.03, 95% CI (1.54, 5.95)], perceiving EC use as not a sin [AOR=2.59, 95% CI (1.20,

Table 4 Emergency contraceptive utilization and reproductive health-related factors, college female students, Gondar city, Northwest Ethiopia, 2023

Variable	Category	Frequency	Percentage (%)
Started sexual intercourse	No	194	23.83
	Yes	620	76.17
Had exposure to unprotected sex? (*n* = 620)	Yes	582	93.87
	No	38	6.13
Ever used emergency contraceptive(s) (*n* = 620)	Yes	162	26.13
	No	458	73.87
If no for above question why? (*n* = 458)	Fear of infertility	121	26.42
	Fear of provider	78	17.03
	Fear of side effects	194	42.36
	No information	65	14.19
Use EC regularly to prevent unwanted pregnancy (*n* = 162)	No	127	78.40
	Yes	35	21.60
Age at first sex (*n* = 620)	14–19	368	59.35
	20–22	252	40.65
Ever become pregnant (*n* = 620)	Yes	64	10.32
	No	556	89.68
Was it unplanned pregnancy? (*n* = 64)	Yes	63	98.44
	No	1	1.56
Have you had an induced abortion (*n* = 64)	Yes	56	87.50
	No	8	12.50
Place of abortion (*n* = 56)	Government health institution	14	25.00
	Private clinic	39	69.64
	Traditional method	3	5.36
Discuss on reproductive health issues with husband/partner (*n* = 620)	Yes	279	34.28
	No	535	65.72
Discuss on reproductive health issues with friend	Yes	297	36.49
	No	517	63.51
Discuss on reproductive health issues with parents	Yes	257	31.57
	No	557	68.43
Easy to get emergency contraceptives	No	419	48.53
	Yes	395	51.47
Fear side effect of emergency contraceptives	No	217	26.66
	Yes	597	73.34
Sin to use emergency contraceptives	No	221	27.15
	Yes	593	72.85
Emergency contraceptives cause infertility	No	283	34.77
	Yes	531	65.23

5.60)] and adequate knowledge about EC [AOR = 2.32, 95% CI (1.25, 4.29)] were significantly associated with EC utilization.

Thus, our study showed participants who had no discussion about reproductive health issues with their husband/partner had a 91% decrease in the odds of utilizing EC [AOR = 0.09, 95% CI (0.037, 0.20)] compared to their counterparts. In another case, monthly income of greater than 1500 ETB ($US27.63) increases the odds of EC use by a factor of 3.03 [AOR = 3.03, 95%CI (1.54, 5.95)] as compared to those who had a monthly income ≤ 1500 ETB. Another finding also suggested that those who perceived EC use as not a sin increased the odds of using EC by 2.59 times [AOR = 2.59, 95% CI (1.20, 5.60)] compared to their counterpart. Additionally, adequate knowledge about EC increases the odds of using EC by a factor of 2.32 [AOR = 2.32, 95%CI (1.25, 4.29)] as compared to those who had inadequate knowledge about emergency contraceptives (Table 6).

Discussion

In our study, less than half of the participants had adequate knowledge regarding EC. Muslim religion and year of study (3rd and 4th) and being single in marital status were associated with having adequate knowledge about EC. This finding is consistent with a study conducted in Debre Tabor (45.4%) [20]. However, the level of adequate knowledge found in this study is higher than that reported by a study conducted at Haramaya University (25.7%) [15] and Jimma University in Ethiopia (41.9%) [38]. These discrepancies might be due to the time difference as the above studies were conducted a decade ago. Recently, there have been government efforts to improve the accessibility and coverage of sexual and reproductive health promotions throughout the country. These interventions might contribute to the observed differences [39, 40]. On the other hand, our finding is lower than the studies conducted in India (60.1%) [41], Nigeria (67.8% and 51.6%) [12, 18], South Africa (49.8% and 56.5%) [3, 42], and Ethiopia: Dangila (72.5%) [32], Wolkitie (54.8%) [29], Harar (70%) [43], Dessie [44], Debre Markos (62.5%) [45]], and Nairobi, Kenya (74%) [46]. The difference might be due to differences in population, sampling method, and outcome ascertainment. For instance, a study conducted in India used convenience sampling which can greatly affect the magnitude of knowledge [47]. On the other hand, studies conducted in South Africa [3, 42], Ethiopia (Dangila [32], Harar [43], and Dessie [44], and Kenya [46] assessed the knowledge of the participants with a single question "whether they had heard about EC or not", which may increase the figure [48]. In addition, a study conducted in Harar [43] was among graduating students this difference in study population might have cause the observed discordance. The discrepancy between studies conducted at Debre Markos [45] and Nigeria [12, 18] might be due to sociocultural and population differences, the previous studies were conducted among university students while the present study was conducted among college students.

Regarding the use of EC, a few (26.13%) of the sexually active participants used EC. Getting monthly allowance of 1500ETB ($US27.63) and above, perceiving EC use as

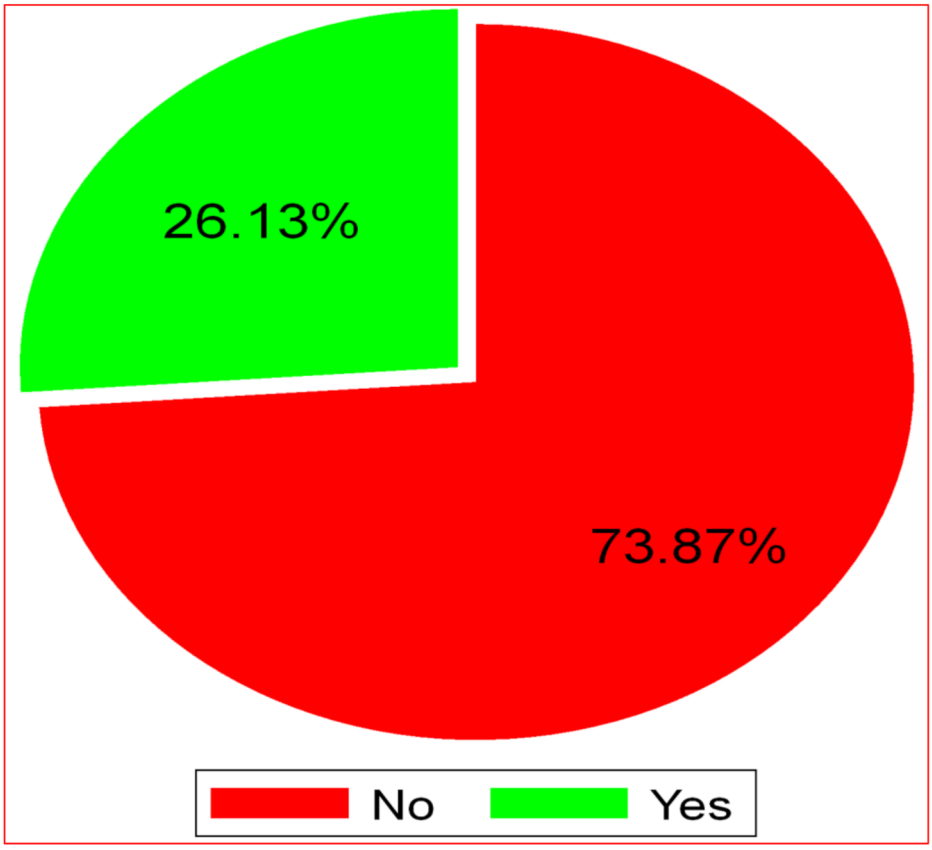

Fig. 2 Utilization of EC among sexually active college female students in Gondar city, Northwest Ethiopia, 2023

not a sin, and knowledge about EC were positively associated, and not discussing RH issues with their partners was negatively associated with EC use. The level of EC use found in this study is consistent with studies conducted in Debre Tabor (28.1%) [20], Dangila (28.6%) [32], and a systematic review conducted in Ethiopia [49]. This might be due to the concordance of the study populations in terms of access to health services and similar sociocultural contexts. Moreover, the temporal relationship between the above studies might be another justification for the observed concordance. The level of EC use found in this study was lower than a study conducted in Nigeria (37.9%) [18], and Tanzania (30%) [50]. However, EC use in this study was higher than in a study conducted in South Africa (11.8%) [42]. The discrepancy might be due to heterogeneity in socio-cultural characteristics, health policies, and infrastructures across those countries.

The level of EC use reported in the current study was lower as compared to that reported in Dire Dawa (69.7%) [37], Harar (33.0%) [43], Arba Minch (78.0%) [51] and Wolkitie (40.5%) [29]. This difference might be justified by differences in sample size and educational level: the above studies were conducted among graduating classes using a small sample size [27, 35]. However, the current study used a relatively larger sample size and included different batch students (first, second, and third year). On the other hand, the level of EC use in this study is higher than that of those reported from, Debre Markos (11.4%) [45], Jimma 6.8% [38], Addis Ababa (4.9%) [4], and Adama (4.7%) [16]. The most likely source of discrepancy would be the difference in study years (almost all of the above studies were done several years back).

Our study revealed that being single in marital status is negatively associated with knowledge of the students about EC which is consistent with previous findings [52]. This might be due to cultural constraints which allowed married women to get information from healthcare providers about different family planning methods [45, 49]. However, singles, for whom extramarital sex is taboo, might not be comfortable accessing information from health facilities.

Our study showed that senior students were more likely to have adequate knowledge about EC as compared to junior students. This finding is supported by previous studies from Debre Markos [45] and Haramaya [15]. The reason might be; that as the duration of campus stay increases, exposure to sexual contacts and access to reproductive health-related information also increases.

Table 5 Factors associated with knowledge of EC, college female students, Gondar city, Northwest Ethiopia, 2023 ($n=814$)

Variables	Category	Knowledge		COR [95% CI]	AOR [95% CI]
		Inadequate	Adequate		
Age	15–19	120	71	1.00	1.00
	20–24	318	305	1.62 [1.162, 2.261]**	0.89 [0.518, 1.517]
Residence	Urban	216	231	1.00	1.00
	Rural	222	145	0.61 [0.462, 0.808]**	0.74 [0.454, 1.209]
Religion	Orthodox	344	262	1.00	1.00
	Muslim	66	96	1.91 [1.343, 2.716]**	1.82 [1.074, 3.086]*
	Protestant	21	16	1.0 [0.512, 1.955]	0.53 [0.228, 1.24]
	Catholic	7	2	0.38 [0.077, 1.821]	0.32 [0.054, 1.911]
Marital status	Single	414	299	0.22 [0.134, 0.364]**	0.34 [0.188, 0.628]**
	Married	22	72	1.00	1.00
	Divorced	2	5	0.76 [0.138, 4.215]	1.65 [0.251, 10.831]
Year of study	1st	175	107	1.00	1.00
	2nd	136	110	1.32 [0.934, 1.873]	1.63 [1.025, 2.581]*
	3rd	103	105	1.67 [1.16, 2.397]**	1.80 [1.107, 2.935]*
	4th	24	54	3.68 [2.15, 6.30]**	2.91 [1.425, 5.958]**
Field of study	Health	98	140	1.00	1.00
	Non health	340	236	0.49 [0.357, 0.66]**	0.84 [0.541, 1.297]
Father education	Cannot read and write	107	89	1.00	1.00
	Can read and write	213	147	0.83 [0.584, 1.179]	0.85 [0.514, 1.421]
	1–8	53	59	1.34 [0.84, 2.131]	1.18 [0.581, 2.38]
	9–12	40	44	1.32 [0.792, 2.207]	0.9 [0.392, 2.069]
	College and above	25	37	1.78 [0.996, 3.178]	0.76 [0.240, 2.403]
Mother education	Cannot read and write	149	123	1.00	1.00
	Can read and write	153	110	0.87 [0.619, 1.226]	0.91 [0.549, 1.52]
	1–8	62	51	1.0 [0.641, 1.548]	0.64 [0.327, 1.237]
	9–12	42	38	1.1 [0.665, 1.806]	0.82 [0.385, 1.733]
	College and above	32	54	2.04 [1.242, 3.364]**	1.15 [0.462, 2.868]
Lives with family	No	116	80	0.75 [0.542, 1.039]	1.11 [0.715, 1.736]
	Yes	322	296	1.00	1.00
Father occupation	Farmer	216	134	1.00	1.00
	Government employer	39	58	2.4 [1.514, 3.796]**	1.09 [0.46, 2.576]
	Private employed	126	129	1.65 [1.19, 2.288]**	1.23 [0.727, 2.091]
	Merchant	57	55	1.56 [1.013, 2.388]*	0.80 [0.401, 1.612]
Mother occupation	House wife	361	262	1.00	1.00
	Government employer	36	76	2.91 [1.897, 4.459]**	2.30 [0.86, 4.851]
	Private employed	22	15	0.94 [0.478, 1.846]	0.72 [0.304, 1.722]
	Merchant	19	23	1.67 [0.890, 3.126]	2.294 [0.992, 5.305]
Monthly allowance	≤ 1500	288	167	1.00	1.00
	> 1500	150	209	2.40 [1.81, 3.190]**	1.49 [0.99, 2.251]
Ever chew Chat	No	431	363	0.45 [0.179, 1.149]	0.72 [0.172, 2.984]
	Yes	7	13	1.00	1.00
Chewing now	No	436	371	0.34 [0.066, 1.765]	0.76 [0.072, 7.926]
	Yes	2	5	1.00	1.00
Ever drink alcohol	No	267	190	0.65 [0.495, 0.865]**	1.33 [0.539, 3.280]
	Yes	171	186	1.00	1.00
Current alcohol drinker	No	269	185	0.61 [0.460, 0.804]**	0.62 [0.252, 1.549]
	Yes	169	191	1.00	1.00
Discuss RH with husband	No	345	190	0.28 [0.203, 0.374]**	0.43 [0.269, 0.686]**
	Yes	93	186	1.00	1.00
Discuss RH with friend	No	328	189	0.34 [0.252, 0.456]**	0.92 [0.54, 1.562]
	Yes	110	187	1.00	1.00

Table 5 (continued)

Variables	Category	Knowledge		COR [95% CI]	AOR [95% CI]
		Inadequate	Adequate		
Discuss RH with parents	No	339	218	0.40 [0.297, 0.546]**	0.70 [0.433, 1.132]
	Yes	99	158	1.00	1.00
Age at first sex	14–19	164	204	1.00	1.00
	20–22	139	113	1.53 [1.109, 2.112]*	1.17 [0.768, 1.776]

*$p<0.05$, **$p<0.01$

In turn, this may improve their knowledge about emergency contraceptives.

In the current study participants who had no discussion about reproductive health with their husbands/partners were less likely to utilize EC compared to their counterparts, which is supported by a previous report from Ethiopia (Debre Markos Town [53]3). This might be because discussion can increase knowledge and, a positive attitude and finally enable practice [51, 54]. Additionally, culturally influenced gender dynamics can influence male attitudes and perceptions about contraceptive use. Thus, male opposition can lead to limited understanding, misunderstandings, male dominance; and physical abuse. These factors may decrease EC utilization, while social support from the husband/partner, adequate information, and shared responsibility can positively influence EC uptake [55].

Moreover getting a higher monthly allowance increases the odds of EC use. This might be related to the accessibility and ability to afford emergency contraceptives from preferred sources. While EC is generally inexpensive, even small costs can be a barrier for low-income students. Having more disposable income allows for easier purchases without financial strain [56]. For instance, a study conducted in the city of Santa Maria (California) indicated that 99.9% of the students acquired EC from drug stores [57]. Therefore, to own these emergency contraceptives they may need to have adequate monthly allowance, which may be the reason.

The result also indicated that individuals who perceive the use of EC as not a sin were more likely to utilize it than their counterparts. This finding is supported by previous evidence from Dessie [58], where the favorable attitude was positively associated with the utilization of EC. Additionally, adequate knowledge about EC increases the odds of using EC as compared to those who have inadequate knowledge about EC. This finding is supported by previous studies [20, 37, 43, 45, 58, 59]. This shows that students who were knowledgeable about EC were aware of where they could get the contraceptives and the potential importance of using EC after unprotected sexual intercourse to prevent themselves from unwanted pregnancy.

The level of knowledge about EC and its use found in this study implied that the Ministry of Ethiopia needs to strengthen the implementation of the national, adolescent, and youth health strategy. Identifying teenage pregnancy, unsafe abortion and HIV among 15–19 and HIV, unsafe abortion, and unintended pregnancy among 20−14 years as key priorities, expanding the adolescent and youth health service package and delivery outlets such as youth educating settings needs special attention. Promoting life skill education using adolescent and youth competence, confidence, connection, character and caring, and contribution (parenting, or caregiver interventions) might be needed to address the observed knowledge gap. Moreover, ensuring access to and provision of minimal adolescent and youth health services packages may enhance the use of contraceptives if needed.

This study was an institution-based study confined to college students, which may not be representative of non-school youths. Moreover, this study did not well address cultural, behavioral, and sensitive issues that deter EC use. Therefore, we recommend further qualitative inquiry to address these circumstances.

Conclusion

In this study, participants' knowledge about EC and the level of emergency contraceptive utilization was found low. Religion (being Muslim), being single, no discussion about reproductive health issues with their husband/partner, year of study (2nd, 3rd, and 4th year) were significantly associated with knowledge about emergency contraceptives. Religion, year of study, marital status, monthly allowance, perception toward EC use, knowledge of EC, and discussion of RH issues were associated with the utilization of EC. Therefore, establishment and/or strengthening school-based health education, behavioral change communication, and opportunities will help students to use emergency contraceptives, if required to prevent unintended pregnancy and its subsequent sequels.

Table 6 Factors associated with the use of EC, college female students, Gondar city, Northwest Ethiopia, 2023 ($n=620$)

Variables	Category	Utilization		COR [95% CI]	AOR [95% CI]
		No	Yes		
Age	15–19	94	12	1.00	1.00
	20–24	364	150	3.228 [1.719, 6.062]**	1.27 [0.488, 3.295]
Residence	Urban	238	107	1.00	1.00
	Rural	220	55	0.56 [0.383, 0.808]**	0.76 [0.394, 1.482]
Religion	Orthodox	336	115	1.00	
	Muslim	92	34	1.08 [0.691, 1.688]	
	Protestant	22	12	1.59 [0.765, 3.322]	
	Catholic	8	1	0.37 [0.045, 2.952]	
Marital status	Single	410	113	0.24 [0.152, 0.383]**	0.63 [0.311, 1.275]
	Married	42	48	1.00	1.00
	Divorced	6	1	0.15 [0.017, 1.261]	0.49 [0.039, 6.162]
Year of study	First year	147	57	1.00	
	Second year	147	41	0.72 [0.453, 1.142]	
	Third year	133	33	0.64 [0.393, 1.043]	
	Fourth year	31	31	2.58 [1.438, 4.626]**	
Field of study	Health	112	62	1.00	1.00
	Non health	346	100	0.52 [0.356, 0.765]**	0.90 [0.489, 1.66]
Father education	Cannot read and write	118	33	1.00	1.00
	Can read and write	213	60	1.01 [0.623, 1.629]	0.66 [0.30, 1.434]
	Grade 1–8	61	24	1.41 [0.764, 2.589]	0.34 [0.125, 1.022]
	9–12	39	25	2.29 [1.217, 4.318]*	0.76 [0.252, 2.275]
	College and above	27	20	2.65 [1.322, 5.308]**	1.26 [0.395, 3.993]
Mother education	Cannot read and write	143	51	1.00	
	Can read and write	153	43	0.66 [0.495, 1.255]	
	Grade 1–8	68	27	1.11 [0.643, 1.927]	
	Grade 9–12	52	14	0.75 [0.386, 1.477]	
	College and above	42	27	1.80 [1.009, 3.218]*	
Lives with family	No	148	26	0.40 [0.252, 0.636]**	0.94 [0.424, 2.078]
	Yes	310	136	1.00	1.00
Father occupation	Farmer	203	54	1.00	
	Government employer	43	30	2.62 [1.506, 4.566]	
	Private employed	153	54	1.33 [0.862, 2.043]	
	Merchant	59	24	1.53 [0.872, 2.681]	
Mother occupation	House wife	354	111	1.00	
	Government employer	56	34	1.94 [1.202, 3.118]	
	Private employed	20	11	1.75 [0.815,3.773]	
	Merchant	28	6	0.68 [0.276, 1.693]	
Monthly allowance	≤ 1500	287	22	1.00	1.00
	> 1500	171	140	10.68[6.558, 17.395]**	3.03 [1.54, 5.952]**
Ever chew Chat	No	451	150	0.19 [0.075, 0.502]**	0.78 [0.156, 3.859]
	Yes	7	12	1.00	1.00
Chewing now	No	456	157	0.14 [0.026, 0.717]*	0.30 [0.023, 3.889]
	Yes	2	5	1.00	1.00
Ever drink alcohol	No	249	69	0.62 [0.434, 0.894]*	0.47 [0.157, 1.391]
	Yes	209	93	1.00	1.00
Current alcohol drinker	No	247	68	0.62 [0.430, 0.888]**	1.63 [0.544, 4.867]
	Yes	211	94	1.00	1.00
Age at first sex	14–19	284	84	1.00	
	20–22	174	78	1.52 [1.056, 2.175]*	
Discuss RH with husband	No	343	9	0.02 [0.01, 0.04]**	0.09 [0.037, 0.203]**
	Yes	115	153	1.00	1.00

Table 6 (continued)

Discuss RH with friend	No	327	29	0.09 [0.056, 0.137]**	0.75 [0.333, 1.688]
	Yes	131	133	1.00	1.00
Discuss RH with parents	No	340	55	0.18 [0.121, 0.263]**	0.74 [0.375, 1.480]
	Yes	118	107	1.00	1.00
Easy to get EC	No	278	26	0.12 [0.078, 0.196]**	0.60 [0.301, 1.187]
	Yes	180	136	1.00	1.00
Fear side effect of EC	No	67	105	10.75[7.108, 16.26]**	1.19 [0.555, 2.544]
	Yes	391	57	1.00	1.00
Sin to use EC	No	64	117	16.01[10.375, 24.69]**	2.59 [1.203, 5.596]*
	Yes	394	45	1.00	1.00
EC causes infertility	No	93	120	11.21[7.377, 17.04]**	2.0 [0.996, 4.022]
	Yes	365	42	1.00	1.00
Knowledge about EC	Adequate	175	28	6.09 [3.99, 9.289]	2.32 [1.253, 4.294]**
	Inadequate	283	34	1.00	1.00

*$p<0.05$, **$p<0.01$

Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
AOR	Adjusted Odds Ratio
CPR	Contraceptive Prevalence Rate
EC	Emergency Contraception
IUCD	Intrauterine Contraceptive Device
RH	Reproductive Health

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TA, AA, DBA, LA , TA & FDB had contributed in the conception, study design, execution, acquisition of data, analysis and interpretation of the result, drafting, reviewing articles; approval of the version for publication agreed to share accountability for all aspects of the work.

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Data availability
All relevant data are included in the manuscript.

Declarations

Ethical approval and consent to participate
This study was conducted in accordance with the Declaration of Helsinki. Ethical clearance was obtained from the institutional review board (IRB) of the University of Gondar. Informed written consent was obtained from the study subjects before the interview. Confidentiality, anonymity, and the right of the individuals not to participate was respected.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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