ORIGINAL RESEARCH

Modern Contraceptive Method Utilization and Associated Factors Among Women of Reproductive Age in Gondar City, Northwest Ethiopia

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Background: Family planning is defined as the ability of couples or individuals to attain their desired number of children, spacing, and timing of their births with the use of contraceptive methods. Ethiopia is one of the most populated countries in Africa with a high fertility rate, a highly unmet need for family planning, and low contraceptive utilization.

Objective: This study aims to assess modern contraceptive method utilization and associated factors among women of reproductive age in Gondar City, Northwest Ethiopia.

Materials and Methods: A community-based cross-sectional study design was undertaken with 708 women in the reproductive age in Gondar City, using a structured questionnaire combined with face-to-face interviews. Descriptive analysis, binary, and multivariable logistic regression analyses were applied to analyze the data.

Results: In this study, 41.2% of the respondents utilized modern contraceptive methods. Of the study participants, 52.1 % had good knowledge and 45.3% had a favorable attitude towards modern contraceptive methods. After adjusting for covariates, the odds of using modern contraceptive methods were 3.6 times, 4.7 times, 2.4 times, and 4 times higher among women of the age 20–24, 25–29, preparatory education, and degree holders, respectively. In addition, for the women having up to six desired children [AOR (Adjusted Odds Ratio) = 2.4 (95% CI: 1.1, 5.3)], a history of no-child death experience [AOR= 4.4 (95% CI: 1.03, 19.1)], good knowledge [AOR= 4.1 (95% CI: 2.7, 6.0)], and favorable attitude [AOR= 3.5 (95% CI: 2.4, 5.1)] were positively associated with modern contraceptive utilization.

Conclusion: The majority of participants had good knowledge about, but the unfavorable attitude towards the utilization of modern contraceptive methods. Therefore, the authors recommended that special awareness creation with the help of health education interventions should be employed in the community.

Keywords: modern contraceptive utilization, knowledge, attitude, reproductive age, Gondar City, Ethiopia

Background

Modern contraceptive use and unmet need for family planning are key to understanding profound changes in fertility and improving reproductive health worldwide.[1] Although contraceptive utilization has increased in many parts of the world, especially in Asia and Latin America, it continues to be low in Sub-Saharan Africa. The global use of modern contraception has risen from 54% in 1990 to 57.4% in 2015 while it has risen from 23.6% to 28.5 % in Africa.[2,3]

Globally, the unmet need for contraception remains very high due to the lack of family planning services; more than 350 million couples have no access to family

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planning services.[3–5] In Global South countries, there are 214 million women within the reproductive age group (15–49 years) who want to avoid pregnancy but have no access to use contraceptive methods. The unmet need for modern contraception among women of the reproductive age accounts for 24.2% in Africa.[3] This, in turn, has a negative effect in the wider development of African countries, contraception use contributes to countries; social and economic development and it is important to achieve the Millennium Development Goals by improving child and maternal health.[2]

In Sub-Saharan African countries, at least thirty women die from the complications of pregnancy and delivery every hour and about 270,000 deaths occur every year. Their fertility rate (5.4 births per woman) is higher than in any other part of the world. This fertility rate doubles that of Asian countries (excluding China) and triples the fertility rate of Europe. The proper use of contraceptive methods can reduce the number of maternal morbidity and mortality by reducing the number of women who are at risk of unwanted pregnancy.[2,5]

In East Africa, the contraceptive use proportion among women of reproductive age is generally higher than in the Sub-Saharan region as a whole. However, there are differences when comparing individual countries (twenty-nine percent for Ethiopia and forty-six percent for Kenya in 2015, for example).[2]

Ethiopia is the second most populated country in Africa (more than 91.73 million); its population size multiplied by almost six times over one century, from 11.5 million in 1900 to 74 million in 2007.[5–8] Currently, the government of Ethiopia is committed to improving the health status of its population and the country has prepared a national adolescent and youth health strategy 2016–2020 in line with the global strategy for Women's, Children's, and Adolescent's Health.[9,10] Ethiopia will continue working to improve the health status of adolescents and youth by increasing the modern contraceptive prevalence rate among women ages 15 to 19 years from thirty-two percent into forty percent and ages 20 to 24 years from thirty-eight percent to forty-three percent; reducing the unmet need for modern contraception among women ages 15 to 19 years from twenty percent to ten percent and among women ages 20 to 24 years from eighteen percent into ten percent.[9,10]

Even if Ethiopia set commitments to achieve a national modern contraceptive prevalence (for all women) of 55% and a total fertility rate of 3.0 in 2020, the reported (2020 projected) national modern contraceptive prevalence and the total fertility rate is at 26.2% and 3.2, respectively. In addition, there is still an unmet need (2020 unmet need for modern contraception is 23.4%) of women of reproductive age for contraception in the country, which is especially strong in rural areas of Ethiopia.[5–10] However, access to the contraceptive services has been increasing due to the expansion of different health care services in the country.[11,12]

Regionally, the contraceptive prevalence differs in published literature depending on the region in Ethiopia.[2,13-15] The prevalence rate of contraceptive methods for Addis Ababa, Amhara Region, Debat Health and Demographic Surveillance System Site, and Dembia District was 63%, 46.9%, 32.5 %, and 31.7%, respectively.[14–17]

As evidence from previously published studies has shown, modern contraceptive utilization is influenced by socioeconomic, demographic, geographical, cultural, and psychological factors.[2,12,15,18,19] Some of these factors include the age of women, their educational status, or the educational status of their husbands, the number of children they have, the number of desired children, the number of live births, their overall attitude on family planning, and the knowledge on family planning.[2,17,18,20-24]

Maternal and neonatal death as consequences of pregnancy, labor, and delivery is one of the priorities of action nationally as well as internationally in recent years. Improving the usage of contraceptive methods is crucial to reduce maternal and child mortality and to improve the socio-economic development of the communities, zonal, regions, and the nation as a whole. The prevalence of modern contraceptive method utilization in different parts of the Amhara region is found to be low and it varies from place to place. Therefore, the aim of this study is to assess the knowledge and attitude towards modern contraceptive methods and the prevalence of modern contraceptive method utilization and its associated factors among women of the reproductive age in Gondar City.

Materials and Methods
Study Design and Settings
The community-based cross-sectional study design was applied. The study was performed in Gondar City, Amhara Regional State, Northwest Ethiopia from the period of 02/01/2018 to 16/04/2019. Gondar City is located 738 km Northwest of Addis Ababa and 170 km North of Bahir-Dar, the capital city of the Amhara Region. According to the national reports conducted by the Central Statistical Agency of Ethiopia, Gondar City has a total population of

360,600, of which 184,007 are women and 176,593 are men. There are 87, 682 females in the reproductive age group (the age between 15 and 49 years). The city has twenty-one Kebeles (local administrative areas) divided into six sub-cities, one comprehensive specialized hospital, and eight governmental health centers.[25]

Sample Size and Sampling Technique

The sample size was calculated using a single population proportion formula; by considering the P- value of 35% from a previous study,[26] at 95% confidence interval (CI), 5 % margin of error and 5 % non-response rate (17.0 women). $n= z(1-\alpha/2)^2 * P\ (1-P)/d^2$, $(1.96)^2$ x 0.35 x 0.65/ 0.0025, (n = 349.6 = n = 349.6 +17 = 366.6, n= 367). This calculated sample size was doubled (x2) to minimize the design effect of the multistage cluster sampling technique; therefore, the final sample size was 734 women.

The multistage cluster sampling technique was used to identify the sub-cities and Kebeles. Among six sub-cities (namely, Arada, Fasil, Jantekel, Zobel, Maraki, and Azezo-Tseda sub-city) found in Gondar City, three sub-cities (Arada, Jantekel, and Maraki) of them were selected randomly using the lottery method. This study also utilized the lottery method to select five Kebeles from three sub-cities (Namely, Kebele six with a proportionate sample size of 153, Kebele nine = 152, Kebele ten =130, Kebele eleven =161, and Kebele eighteen=138) and used systematic sampling methods to select the study participants. The sample size for each of the selected Kebeles was allocated proportionally to the size of the women in the reproductive age of each Kebele (ni = n/N*Ni). Besides, the Kth interval (k = 59) was calculated by using the estimated number of women of the reproductive age to the sample size. All randomly selected women of reproductive age who had lived for the last six months in the selected Kebeles of Gondar City during the data collection period were included in the study. Women who were unable to communicate, seriously ill, or had severe mental health problems during the data collection period were excluded.

Study Variables

Modern contraceptive currently using is a dependent variable.

The knowledge and attitude about modern contraceptives are the secondary outcome variables.

Independent variables include socio-demographic variables: The age of the women, religion, ethnicity, marital status, educational status of the women and their husbands, the occupation of the women and their husbands, and the monthly income of the family. And, reproductive and maternal variables: History of pregnancy, age at first pregnancy, the number of pregnancies, all live newborn deliveries, the number of children live, the number of children desired, family size, knowledge, and the attitude about modern contraceptive utilization.

Operational Definition

Women of the reproductive age group: The women's age ranged between 15 and 49 years.

Modern contraceptive utilization: When a woman in the reproductive age reported using any method of modern family planning or contraceptives (eg injectable, regular pills, emergency pills, Implanon, intrauterine device, condom, and surgical methods).

Knowledge

When talking about "knowledge" it refers to the know-how about contraceptive methods. Women's knowledge level about the contraceptive method was measured by using 18 knowledge-related questions (18-point scale items). All knowledge variables were computed (each correct response was given a score of 1 and a wrong response was given a score of 0) to differentiate between good and poor knowledge. A higher overall score indicated better knowledge in regards to contraceptive methods (possible scores ranged from 0 to 18). The knowledge level classification is based on previously conducted studies on related matters. The responses of those who scored the mean value and above in the knowledge-related questions were categorized into as having good knowledge and those who scored below the mean value were labeled as having poor knowledge.[27,28]

Good knowledge: Participants who responded to the mean (9.2) and above of the total knowledge questions had good knowledge about modern contraceptive methods.

Poor knowledge: Participants who responded below the mean (9.2) of the total knowledge questions had poor knowledge about modern contraceptive methods.

Women's comprehensive knowledge about contraceptive methods was assessed using the main components of contraceptive methods, such as the knowledge of the respondents on the type of contraceptive methods they know, their understanding of the purpose of using contraceptive methods, and their consciousness about how and where contraceptive methods can be found.

Attitude

Under "attitude", the research term understood women's views and opinions towards the contraceptive methods. Women's attitude about contraceptive methods was measured with the help of 10 attitude-related questions using a five-point Likert Scale. The questions on the Likert scale had positive and negative responses that ranged from strongly agree to, agree, neutral (neither agree nor disagree), disagree, and strongly disagree. The scoring system used with respect to the participant's responses was as follows: strongly agree 5, agree 4, neutral 3, disagree 2, and strongly disagree 1. The order of scoring for negative statements was reversed. The attitude responses were summed-up and a total score was obtained for each respondent. The mean was calculated and those who scored the mean value and above had a favorable attitude and the ones who scored below the mean value had an unfavorable attitude towards the contraceptive method.[27,28]

Favorable attitude: Participants who answered higher than or equal to the mean (30.0) in the attitude questions had a favorable attitude towards modern contraceptive methods.

Unfavorable attitude: Participants who answered below the mean (30.0) in the attitude questions had an unfavorable attitude.

Women's comprehensive attitude towards modern contraceptive methods (the women were able to rank the extent to which they agreed or disagreed with the following negative attitudes towards contraceptive methods) was assessed asking about their opinions on perception such as "short-acting contraceptives are more effective than long-acting contraceptives", "the side effects of contraceptives are dangerous to the mother" or, " having many children helps to improve the income of the family", "contraceptive use causes infertility in women", "child mortality is compensated by many births", or "contraceptive usage decreases sexual satisfaction". In addition, the participants were able to rank the extent to which they agreed or disagreed with the following positive attitudes towards contraceptive methods: "contraceptives help the couple to become responsible parents", "child spacing helps to protect the health of mothers and children", "contraceptives help a mother to regain her strength for the next baby", and "the husband should share the responsibility of the contraceptive use".

Data Collection Tools, Techniques, and Procedures

The data were collected through face-to-face interviews using a structured Amharic questionnaire. The questionnaire was first prepared in English, translated into Amharic (local language), and later, back to English to ensure the accuracy of the meaning. The data collection questionnaire was adapted using tools used to assess contraceptive utilization in previous studies with similar aims.[2,5,7,17,18,26,29] The questionnaire was designed to have six sub-topics. Namely, socio-demographic, reproductive and maternal, source of information, knowledge, attitude, and utilization-related characteristics. Trained clinical nurses collected the data. After the data collection with each participant, health education or information was provided about modern contraceptive methods. The questionnaire was pre-tested in similar settings by the investigators before the data collection on 5 % of the total sample size.

Data Processing and Analysis

The collected data were checked for completeness, accuracy, and clarity. The collected data were analyzed by the investigators using Version 14.0 Stata Statistical Software. The coding and missing values were considered before analysis. Descriptive analysis was done to describe the frequency and percentage of dependent and independent variables. Binary logistic regression and multivariable logistic regression analysis were done to describe the association between dependent and independent variables and independent predictors of modern contraceptive utilization. The crude odds ratio and adjusted odds ratio were used for testing associations between independent and dependent variables. The variables that have a P-value less than or equal to 0.05 at bivariate analysis were included in the multivariable logistic regression to control possible confounding factors.

Ethical Consideration

This study was reviewed and approved by the ethical review board of MTY Abyssinia Medical Science College. Ethical clearance was obtained from the ethical review committee of MTY Abyssinia Medical Science College Research and the Publication Office. Besides, an official letter was sent and permission was obtained from Gondar City Administrative Health Office. The aim of this study was described to all women, and all evidence obtained from them was secured and kept confidential. To ensure confidentiality, no names were taken or written onto the questionnaires. Written informed consent was obtained from all respondents who participated in the study (participants under the age of 18 years were approved by the ethics

committee to provide written informed consent on their own behalf).

Results

Socio-Demographic Characteristics of the Respondents

A total of 708 women of the reproductive age were involved in the study (response rate = 96.5 %), of whom 33.3% were between 25 and 29 years old. The mean age of the respondents was 28.3 ± (S.D. = 6.5) years ranging from 16–49 years. Of the total of the respondents, the majority identified as Amhara in their ethnicity (94.0%). Further characteristics collected showed that 69.8 % were orthodox in their religion, most of the women were married (87.7%), and 24.2% were university degree and above holders concerning their education level. About half of the respondents were homemakers in their occupation (49.9%). Among the respondent's husbands, 31.8% were government employees in their occupation and 31.5% had a degree or above with respect to their educational qualification (Table 1).

Reproductive and Maternal Characteristics

The majority of the respondents had a history of previous pregnancies (88.6%) and their age at first pregnancy (40.3%) was between 20 and 24 years. Of 708 respondents, 50.8% had one up to two pregnancies, 89% had a live newborn in all deliveries, 96.5% had a history of non-child death experience, 70.2% had one up to three live children, 58.1% had four up to six desired children, and 49.6% had four up to six family sizes (Table 2).

Source of Information About Modern Contraceptive Methods

All (100%) of the women in the reproductive age group have heard about at least one modern contraceptive method. The main source of information about modern contraceptives was health care providers 460 (65%), Mass media (Radio, Television, etc.) 380 (53.7%), peers 370 (52.3%), and health extension workers 287 (40.5%). The schools 120 (17%), families 86 (12.1%), and the husband 253 (35.7%) had less contribution in disseminating information about the modern contraceptive usages.

Table 1 Socio-Demographic Characteristics of the Reproductive Age Women in Gondar City, Northwest Ethiopia, 2019

Characteristics	Frequency (n= 708)	Percent (%)
Age of the respondent (in years)		
15–19	40	5.6
20–24	173	24.4
25–29	236	33.3
30–34	105	14.8
35–39	107	15.1
40 and above	47	6.6
Ethnicity		
Amhara	666	94.0
Oromo	9	1.3
Tigray	33	4.7
Religion		
Orthodox	494	69.8
Muslim	167	23.6
Catholic	9	1.3
Protestant	38	5.4
Marital status		
Married	621	87.7
Separated	26	3.7
Divorced	16	2.3
Single	45	6.4
Educational status of the respondent		
Unable to read and write	76	10.7
Able to read and write	64	9.0
Primary education	101	14.3
Secondary education	108	15.3
Preparatory education	88	12.4
Certificate and diploma holder	100	14.1
Degree holder and above	171	24.2
Educational status of the husband		
Unable to read and write	49	6.9
Able to read and write	63	8.9
Primary education	83	11.7
Secondary education	110	15.5
Preparatory education	99	14.0
Certificate and diploma holder	81	11.4
Degree holder and above	223	31.5
Occupation of the respondent		
House wife	353	49.9
Merchant	86	12.1
Government employee	155	21.9
Daily laborer	30	4.2
Student	72	10.2
Private employee	12	1.7

(*Continued*)

Table 1 (Continued).

Characteristics	Frequency (n= 708)	Percent (%)
Occupation of the husband		
Merchant	182	25.7
Government employee	225	31.8
Daily laborer	168	23.7
Student	72	10.2
Private employee	61	8.6
Monthly income (in Ethiopian birr)		
≤600	58	8.2
601–1650	164	23.2
1651–3200	149	21.0
3201–5250	182	25.7
5251 and above	155	21.9

Table 2 Reproductive Health Characteristics of Reproductive Age Women in Gondar City, Northwest Ethiopia, 2019

Reproductive Characteristics	Frequency (n= 708)	Percent (%)
History of pregnancy		
Yes	627	88.6
No	81	11.4
Age at first pregnancy in years (n = 627)		
10–14	7	1.0
15–19	158	22.3
20–24	285	40.3
25 and above	177	25.0
Number of pregnancies (n = 627)		
1–2	360	50.8
3–4	185	26.1
5–6	82	11.6
All deliveries live newborn		
Yes	630	89.0
No	78	11.0
History of child death experience		
No	683	96.5
Yes	25	3.5
Number of live children (n = 683)		
1–3	497	70.2
4–6	186	26.3
Number of children desired		
1–3	243	34.3
4–6	411	58.1
7 and above	54	7.6
Family size		
1–3	235	33.2
4–6	351	49.6
7 and above	122	17.2

Knowledge About Modern Contraceptive Methods

The most widely known modern contraceptive methods were injectables 603 (85.2%), regular pills 545 (77.0%), Implanon 382 (53.9%), and condom 338 (47.7%). Some of the women knew about emergency pills 197 (27.8%), the intrauterine device 268 (37.9%), and female and male surgical method 102 (14.4%).

The study respondents knew that the purpose of using modern contraceptives to different degrees. Many understood its purpose for enabling spacing of pregnancies 509 (72%) or delaying pregnancy 360 (50.8%), while less consciousness was there about its aim to limit 207 (29.2%), preventing unwanted pregnancy 176 (24.9%), for medical reason 37 (5.2%), and decreasing maternal mortality and morbidity 93 (13.1%).

The majority of the women mentioned that the modern contraceptive methods can be found in the health centers 617 (87.2%), public hospitals 381 (53.8%), and private clinics 365 (51.6%). A fewer number of women mentioned that contraceptives can be found in the pharmacy 240 (34%) and family guidance institutions 142 (20.1%).

Participant's Attitude Towards Modern Contraceptive Methods

Forty-two percent of the women disagreed that the notion of short-acting contraceptives are more effective than long-acting contraceptives, but 36.1% believed that the contraceptives had a side effect and could be dangerous to the mother. In addition, 39.8% considered that contraceptive use could cause infertility in women (Table 3).

Modern Contraceptive Utilization and Related Information

Of 708 respondents, 56.2% used modern contraceptives at some point in their lives. The prevalence of modern contraceptive use during the study period was 41.2%. Of the current users, the most preferable method was injectable 151 (51.7%). The majority of the women,

Table 3 Participants Attitude Towards Modern Contraceptive Methods in Gondar City, Northwest Ethiopia, 2019

	Attitude Questions Items (Correct Answer)	Response	Frequency with Correct Answer (n=708)	Percent (%)
1.	Do you think that short acting contraceptives are more effective than long acting contraceptives	Strongly disagree Disagree Neutral Agree Strongly agree	104 299 79 174 52	14.7 42.2 11.2 24.6 7.3
2.	Do you think/agree contraceptives have side effect and it will be dangerous to the mother	Strongly disagree Disagree Neutral Agree Strongly agree	78 179 75 256 120	11.0 25.3 10.6 36.1 17.0
3.	Do you think too many children help to improve the income of the family	Strongly disagree Disagree Neutral Agree Strongly agree	130 183 87 234 74	18.4 25.8 12.3 33.0 10.5
4.	Do you think the contraceptives help the couple to become responsible parents	Strongly disagree Disagree Neutral Agree Strongly agree	113 190 61 225 119	16.0 26.8 8.6 31.8 16.8
5.	Do you think contraceptive use cause infertility in the women	Strongly disagree Disagree Neutral Agree Strongly agree	66 184 77 282 99	9.3 26.0 10.9 39.8 14.0
6.	Do you think child mortality is compensated by too much birth	Strongly disagree Disagree Neutral Agree Strongly agree	51 186 52 332 87	7.2 26.1 7.3 47.0 12.4
7.	Do you think that child spacing helps to protect the health of the mothers and children	Strongly disagree Disagree Neutral Agree Strongly agree	57 234 27 310 80	8.1 33.1 3.8 43.8 11.3
8.	Do you think that contraceptives help a mother to regain her strength for the next baby	Strongly disagree Disagree Neutral Agree Strongly agree	20 203 31 372 82	2.8 28.7 4.4 52.5 11.6
9.	Do you think the husband shares the responsibility of the contraceptive use	Strongly disagree Disagree Neutral Agree Strongly agree	97 281 59 212 59	13.7 39.7 8.3 29.9 8.3

(*Continued*)

Table 3 (Continued).

	Attitude Questions Items (Correct Answer)	Response	Frequency with Correct Answer (n=708)	Percent (%)
10.	Do you think contraceptive use decrease sexual satisfaction	Strongly disagree Disagree Neutral Agree Strongly agree	43 160 165 262 78	6.1 22.6 23.3 37.0 11.0

147 (50.3%), received the contraceptives from health centers. 274 (68.8%) stopped the contraceptive use, and the major factor for this pause was their wish to have another child 159 (58%). Among the current users, half of them (54.7%) reported that the decision to use contraceptive methods was made jointly with their husbands (Table 4). Most of the women mentioned that the main reason for not using contraceptives during the study period was an intention to have another child 139 (33.4%), but eight (1.9%) women were not using contraceptives for medical contraindications (Figure 1).

Level of Knowledge and Attitude Towards Modern Contraceptive Methods

In this study, 369 (52.1%) of all respondents had good knowledge of modern contraceptive methods. In addition, about 321 (45.3%) respondents had a favorable attitude towards modern contraceptive methods.

Factors Associated with Modern Contraceptive Utilization

Binary logistic regression analysis showed that the age of the respondents, educational status of the respondent,

Table 4 Modern Contraceptive Utilization and Related Issues Among Women of Reproductive Age in Gondar City, Northwest Ethiopia, 2019

| S.No	Contraceptive Utilization	Response	Frequency (n= 708)	Percent (%)
1.	Ever used contraceptive methods	No Yes	310 398	43.8 56.2
2.	Modern contraceptive currently using	No Yes	416 292	58.8 41.2
3.	Methods currently using (n=292)	Injectables Implants Intrauterine device Pills Condom	151 51 9 70 11	51.7 17.5 3.0 24 3.8
4.	The place where you got the methods (n=292)	Public hospital Private hospital/Clinic Health center Pharmacy/Drug store	19 45 147 81	6.5 15.4 50.3 27.8
5.	Ever defaulted contraceptive methods (n = 398)	No Yes	124 274	31.2 68.8
6.	Factors for discontinuation of the contraceptives (n=274)	Sickness/side effect To have an extra child Living away from husband	65 159 50	23.7 58.0 18.3
7.	Who decide the contraceptive use	Husband only Women only Jointly	102 219 387	14.4 30.9 54.7
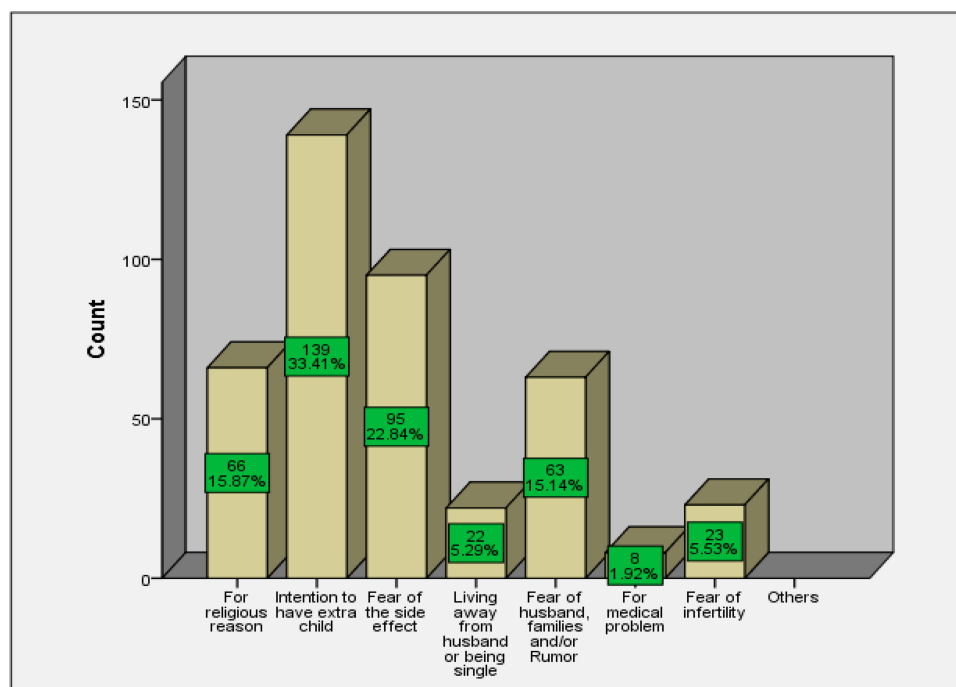
Figure I The main reasons for not using the modern contraceptive methods currently among women of reproductive age group in Gondar City, Northwest Ethiopia, 2019.

educational status of the husband, the numbers of children who were born live, numbers of desired children, no history of child-death experience, all live newborn deliveries, good knowledge, and positive attitude were factors associated with their contraceptive utilization. All variables that show statistically significant association in binary logistic regression were entered into a multivariable logistic regression to rule out confounders. Accordingly, respondents aged between 15 and 19 years were found to be 5 times [AOR =5.4 (95% CI: 1.6, 18.8)] more likely to utilize modern contraceptives as compared to those aged above 40 years. Being in the age group from 20–24 years made them 4 times [AOR =3.6 (95% CI: 1.3, 9.5)] more likely to utilize modern contraceptives as compared to being in the age of above 40 years; and being in the age group from 25–29 years women were 5 times [AOR = 4.7 (95% CI: 1.8, 12.3)] more likely to utilize modern contraceptives as compared to that of above 40 years of age. Respondents who completed preparatory education were 2 times [AOR=2.4 (95% CI: 1.02, 5.6)] more likely to utilize modern contraceptives as compared to those respondents who were unable to read and write. Respondents who completed their certificate and diploma education were 2 times [AOR= 2.3 (95% CI: 1.01, 5.3)] more likely to utilize modern contraceptives as compared to women unable to read and write. Respondents with completed

their degrees and above educational status were 4 times [AOR= 4.0 (95% CI: 1.8, 8.9)] more likely to utilize modern contraceptives as compared to respondents unable to read and write. Women with husbands who completed their primary, preparatory, diploma, and degree and above education were 5 times, 4 times, 5 times, and 3 times, respectively, more likely to utilize modern contraceptives as compared to those with husbands unable to read and write (Table 5).

Participants having below six desired children were 2 times [AOR= 2.4 (95% CI: 1.1, 5.3)] more likely to utilize modern contraceptives as compared to those having above seven desired children. Respondents who did not have a child death experience were 4 times [AOR= 4.4 (95% CI: 1.03, 19.1)] more likely to utilize modern contraceptives as compared to respondents who had child death experiences. Those having all their deliveries with live newborns were 2 times [AOR=2.3 (95% CI: 1.2, 4.6)] more likely to utilize modern contraceptives as compared to those without having all their deliveries been completed with live newborns. Respondents with a good knowledge about family planning options were 4 times [AOR= 4.1 (95% CI: 2.7, 6.0)] more likely to utilize modern contraceptives as compared to those who have poor knowledge. Those having a positive attitude were 4 times [AOR= 3.5 (95% CI: 2.4, 5.1)] more likely to utilize modern

Table 5 Multivariable Logistic Regression Analysis on Factors Associated with Modern Contraceptive Utilization Among Women of Reproductive Age in Gondar City, Northwest Ethiopia, 2019

Characteristics	Contraceptive Utilization		Crude OR (95% CI)	Adjusted OR (95% CI)
	No	Yes		
Age of the respondent (in years)				
15–19	24	16	3.25 (1.21, 8.74)*	5.41 (1.56, 18.78)*
20–24	99	74	3.64 (1.61, 8.26)	3.57 (1.34, 9.52)*
25–29	126	110	4.26 (1.91, 9.50)*	4.73 (1.81, 12.34)*
30–34	51	54	5.16 (2.20, 12.1)*	4.66 (1.71,12.73)*
35–39	77	30	1.90 (0.80, 4.53)	2.40 (0.87, 6.76)
40 and above	39	8	1.00	1.00
Ethnicity				
Amhara	386	280	1.54 (0.69, 3.04)	–
Oromo	8	1	0.25 (0.03, 2.26)	–
Tigray	22	11	1.00	–
Religion				
Orthodox	279	215	1.32 (0.67, 2.62)	–
Muslim	107	60	0.96 (0.46, 1.20)	–
Catholic	6	3	0.86 (0.19, 4.00)	–
Protestant	24	14	1.00	–
Marital status				
Married	366	255	1.05 (0.56, 1.94)	–
Separated	16	10	0.94 (0.35, 2.52)	–
Divorced	7	9	1.93 (0.61, 6.11)	–
Single	27	18	1.00	–
Educational status of respondent				
Unable to read and write	59	17	1.00	1.00
Able to read and write	53	11	0.72 (0.31, 1.68)	1.18 (0.43, 3.29)
Primary education	72	29	1.40 (0.70, 2.79)	1.32 (0.56, 3.12)
Secondary education	59	49	2.88 (1.49, 5.57)*	1.86 (0.81, 4.23)
Preparatory education	44	44	3.47 (1.75, 6.87)*	2.40 (1.02, 5.63)*
Certificate and diploma holder	48	52	3.76 (1.93, 7.33)*	2.32 (1.01, 5.33)*
Degree holder and above	81	90	3.86 (2.08, 7.15)*	4.04 (1.82, 8.95)*
Educational status of the husband				
Unable to read and write	44	5	1.00	1.00
Able to read and write	53	10	1.66 (0.53, 5.22)	0.81 (0.21, 3.18)
Primary education	49	34	6.11 (2.20, 17.0)*	5.10 (1.60,15.92)*
Secondary education	65	45	6.09 (2.24, 16.60)*	3.02 (0.99,9.19)
Preparatory education	48	51	9.35 (3.42, 25.56)*	4.03(1.32, 12.36)*
Certificate and diploma holder	38	43	10.0 (3.58, 27.69)*	4.62 (1.48,14.46)*
Degree holder and above	119	104	7.69 (2.94, 20.12)*	3.09 (1.06, 9.01)*
Occupation of the respondent				
House wife	213	140	1.00	
Merchant	49	37	1.15 (0.71, 1.85)	–
Government employee	89	66	1.13 (0.77, 1.66)	–
Daily laborer	14	16	1.74 (0.82, 3.68)	–
Student	47	25	0.81 (0.48, 1.38)	–
Private employee	4	8	3.04 (0.90, 10.30)	–

(*Continued*)

Table 5 (Continued).

Characteristics	Contraceptive Utilization		Crude OR (95% CI)	Adjusted OR (95% CI)
	No	Yes		
Occupation of the husband				
Merchant	100	82	1.45 (0.80, 2.65)	–
Government employee	135	90	1.18 (0.66, 2.13)	–
Daily laborer	93	75	1.43 (0.78, 2.62)	–
Student	49	23	0.83 (0.41, 1.71)	–
Private employee	39	22	1.00	–
Monthly income				
≤600	37	21	1.00	–
601–1650	95	69	1.28 (0.69, 2.38)	–
1651–3200	89	60	1.19 (0.63, 2.23)	–
3201–5250	111	71	1.13 (0.61, 2.08)	–
5251 and above	84	71	1.49 (0.80, 2.77)	–

Note: *Statistically significant at P-value ≤0.05 in binary logistic regression and multivariable logistic regression analysis.
Abbreviation: OR, odds ratio.

contraceptives as compared to those who had a negative attitude (Table 6).

Discussion

This community-based study was employed to determine the prevalence of and to identify factors associated with modern contraceptive utilization in Gondar City. Accordingly, the age of the women, the educational status of the respondent, the educational status of the husband, the history of non-child death experience, the number of desired children, all live newborn deliveries, their knowledge, and their attitude level, were significantly associated with modern contraceptive utilization.

In this study, the overall prevalence of modern contraceptive utilization was 41.2%. This finding is almost in line with the findings from the DHSAR and compares to the Ethiopian national level, Mojo Town, Debre-Brahhan (urban vs rural), Boditi Town, and Gondar hospital. The observed small variation may be due to the difference in study setting (urban vs rural), and study design (institution vs community-based).

Though one may find the rising trend prevalence of modern contraceptive methods in Gondar city promising, the numbers still compare poorly on an international scope.[31] The variation may be due to the presence of different population characteristics, and the difference in countries' health policy.[15] Similarly, it is lower than in comparison with the study results from Addis Ababa City, Arba-Minch Town, Farta District, Arsi Zone, and SNNPR (Table 7).

Gondar's contraceptive usage seems, however, higher than what the findings from studies conducted in Dembia District, DHDSSS, and Afar Region indicate. The reason for this could be the fact that the study participants of our research were from urban areas, while, for instance, the participants from the pastoralist community were recruited for the study in the Afar Region. The differences in the place of residency, religion, year of the study, and community literacy affect modern contraceptive utilization.[5,12,15] According to studies, there is regional variation in modern contraceptive utilization in Ethiopia.[2,12-15]

Regarding modern contraceptive methods, 51.7% of respondents were users of injectable types of contraceptive methods. This finding is in agreement with other previous studies in Ethiopia.[2,7,15,17,18] The reason may be due to its convenience and availability. Next to the injectable method, widely used contraceptive methods were pills, implants, and intrauterine devices. This finding is similar to the findings from Arba-Minch Town, Farta District, and Gondar hospital.

In this study, socio-demographic and reproductive variables were assessed for its correlation with modern contraceptive utilization. Being above the age of forty was negatively correlated with contraceptive utilization. This finding is supported by the study conducted in the Debre-Brahhan, Arba-Minch Town, Dembia District, Shire-Endaslasie Town,[33] SNNPR, and DHDSSS. This is related to the fact that older women may be in less need of contraceptive methods.[7,15,18]

Table 6 Multivariable Logistic Regression Analysis on Factors That Associated with Modern Contraceptive Utilization Among Women of Reproductive Age in Gondar City, Northwest Ethiopia, 2019

Characteristics	Contraceptive Utilization		Crude OR (95% CI)	Adjusted OR (95% CI)
	No	Yes		
History of pregnancy				
Yes	363	264	1.38 (0.85, 2.24)	–
No	53	28	1.00	–
Age at first pregnancy (in years)				
10–14	4	3	1.68 (0.35, 8.07)	–
15–19	92	66	1.61 (0.91, 2.84)	–
20–24	157	128	1.83 (1.08, 3.09)*	–
25 and above	107	70	1.00	
Number of pregnancies				
1–2	219	141	1.00	–
3–4	97	88	1.29 (0.78, 2.14)	–
5–6	46	36	1.81 (1.05, 3.13)*	–
All deliveries live newborn				–
Yes	357	273	2.37 (1.38, 4.08)*	2.34 (1.19, 4.59)*
No	59	19	1.00	1.00
History of child death experience				
No	394	289	5.38 (1.59, 18.14)*	4.43 (1.03, 19.06)*
Yes	22	3	1.00	1.00
Number of children live				
1–3	316	181	1.00	1.00
4–6	93	93	1.75 (1.24, 2.45)*	1.41 (0.90, 2.19)
Number of children desired				
1–3	127	116	2.88 (1.47, 5.65)*	2.03 (0.89, 4.65)
4–6	248	163	2.07 (1.08, 4.00)*	2.39 (1.08, 5.31)*
7 and above	41	13	1.00	1.00
Family size				
1–3	152	83	1.00	–
4–6	192	159	1.52 (1.08, 2.13)*	–
7 and above	72	50	1.27 (0.81, 1.99)	–
Overall knowledge about contraceptives				
Good knowledge	154	215	4.75 (3.42, 6.59)*	4.05 (2.73, 6.01)*
Poor knowledge	262	77	1.00	1.00
Overall attitude about contraceptives				
Positive attitude	120	201	5.45 (3.93, 7.55)*	3.48 (2.37, 5.11)*
Negative attitude	296	91	1.00	1.00

Note: *Statistically significant at P-value ≤0.05 in binary logistic regression and multivariable logistic regression analysis.
Abbreviation: OR, odds ratio.

The higher educational status of the respondents and their husbands was significantly and positively associated with modern contraceptive utilization. This finding is supported by the study conducted among the Dembia District, Arba-Minch Town, Boditi Town, DHDSSS, Mojo Town, Afar Region, Shire-Endaslasie Town, and Gondar hospital. This can be explained with the idea that women with better educational levels have better access to health care information, have greater independence to make their own and informed decisions, and greater ability to use health care services. The positive effect of education helps women to increase their understanding of reproductive health issues

Table 7 Comparison of the Prevalence of Modern Contraceptive Utilization with Various Previous Studies

Previous Studies	Prevalence (%)
Demographic and health survey of the Amhara Region (DHSAR)[14]	46.9%
Ethiopian national level[12]	36.0%
Mojo Town[30]	38.3%
Debre-Brahhan, urban[24]	48.6%
Debre-Brahhan, rural[24]	41.21%
Boditi Town[29]	48.2%
Previous Gondar hospital study[26]	35.0%
Addis Ababa City[16]	63%
Arba-Minch Town[18]	63.4%
Farta District[1]	66.2%
Arsi Zone[32]	67.4%
South Nations Nationalities and Peoples Region of Ethiopia (SNNPR)[7]	53.3%
Dembia District[17]	31.7%
Debat Health and Demographic Surveillance System Site (DHDSSS)[15]	32.5%
Afar Region[5]	8.5%
Ethiopia, Gondar City (Current study)	41.2%

and to understand and use the different contraceptive methods that suit their health condition best. It also increases the overall status of women in knowledge, attitude, and health-seeking behavior.[15,18,30]

Women whose deliveries were all live newborns were more likely to use the contraceptive methods as compared to their counterparts. Similar correlations have been found in previously conducted studies in the Shire-Endaslasie Town, Debre-Brahhan, and SNNPR. Because of contraceptive usage (and thus, spacing, etc.), the likelihood of healthy newborns increases. The experience of delivering at health institutions will allow women to get more family planning-related information at the time of antenatal, delivery, and postnatal care visits.[7,24,33]

Women with smaller numbers of desired children were more likely to utilize contraceptive methods as compared to those who have more desired children. This finding is supported by the study conducted in the Debre-Brahhan and SNNPR. One may assume that once the respondent decided to have fewer children, they will use contraceptive methods to limit their births. It might be due to the fact that globally, one can see that the more educated people are, the smaller the amount of the desired children is.

Those who had child death experience were less likely to utilize contraceptive methods as compared to those women with non-child death experience. This finding is

supported by some studies.[7,33] This could be due to an intention to replace the lost ones and the need to have more children.[7] In the social perspective, communities that are less educated and thus, rely on their children to ensure their care when old.

In this study, women having good knowledge of contraceptive methods were more likely to use modern contraceptives as compared to those who had poor knowledge. This is in line with the findings from Arba-Minch Town, Farta District, and SNNPR. The lack of awareness about contraceptive methods was a key factor that preventing women in the reproductive age from using contraceptives.[2,18] The women who had a positive attitude had higher odds of using contraceptives. This is in line with findings from the Afar Region and SNNPR. This implies that having a positive attitude is an important factor for promoting contraceptive utilization, and it creates a favorable environment to accept informed consent to health care providers who offer contraceptive methods.[5] According to the participants of this study, their negative attitude comes from the rumor that the modern contraceptives contain an ingredient that may lead to infertility, as well as the perception change due to the previous political situations in Ethiopia.

As migraine prevalence is high in women of reproductive age, it is common to face the issue of migraine and hormonal contraceptive use in clinical practice. Menarche, menstruation, pregnancy, and menopause, and the use of hormonal contraceptives may influence migraine occurrence.[34–36] Truly speaking, migraine with aura is a risk factor for ischemic stroke, cardiac disease, and vascular mortality.[36] Systematic reviews have shown that administration of combined oral contraceptives to migraineurs may further increase the risk for ischemic stroke.[34–39] In order to avoid the risks, migraine with aura, hereditary thrombophilia, and epileptic patients should take non-hormonal forms of the contraception.[36,37,40] However, in migraine without aura patients, the use of combined oral contraceptives may not be contraindicated, but their intake must be suspended if aura symptoms appear. Moreover, other risk factors for stroke must be carefully considered when prescribing it (smoking, hypertension, diabetes, hyperlipidemia, thrombophilia, obesity, age over 35 years (a very important factor), for example).[38,39]

Strength and Limitations of the Study

This is a community-based study, performed based on a random sampling method and it has a high sample size

to increase the precision. The study has assessed the overall knowledge and attitude towards modern contraceptives, which can function as a barrier to contraceptive utilization.[15] The cross-sectional nature of the study does not allow making assumptions surrounding causal effects between the relationships.

Conclusion

The majority of the participants had good knowledge and an unfavorable attitude towards modern contraceptive utilization.

Factors like the age of the women, the educational status of the respondent, the educational status of their husband, the history of non-child death experience, the number of children desired, all deliveries live newborns, good knowledge, and favorable attitude were independently associated with the modern contraceptive utilization.

Therefore, the authors recommend that special awareness creation through the means of health education should be given to the community. This will help them to develop appropriate knowledge and attitude towards modern contraceptive utilization. Further, women's educational levels should be improved by applying continuous efforts in order to increase their understanding of reproductive and family planning issues. It is also important to give special emphasis for those aged between fifteen and thirty-five years and for those having many desired children.

Data Sharing Statement

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

Author Contributions

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; gave final approval of the version to be published; and agree to be accountable for all aspects of the work.

Disclosure

The authors declare that they have no competing interests in this work.

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