

Research Article

Modern Contraceptive Use and Influencing Factors in Amhara Regional State: Further Analysis of Ethiopian Demographic Health Survey Data 2016

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Received 8 February 2020; Revised 11 April 2020; Accepted 15 June 2020; Published 23 July 2020

Academic Editor: Jagdish Khubchandani

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Background. Ethiopia is one of the Sub-Saharan African countries with a high unmet need for contraceptives. Contraception is a good indicator of the extent to which couples have access to reproductive health services. A study on contraceptives can provide overall direction by helping to identify the obstacles in society and weaknesses in services that need to be overcome. However, little is known in Amhara region context. Therefore, this analysis was aimed to assess modern contraceptive use and influencing factors in the Amhara regional state of Ethiopia. **Methods.** We used secondary data analysis of the regional representative sample of women aged 15–49 years from the 2016 Ethiopian Demography and Health Survey (EDHS). A total of 2207 married reproductive-age women (15–49 years) selected using a two-stage stratified cluster sampling technique were included in this analysis. Both descriptive and logistic regression analyses were performed using STATA V.14. A 95% confidence interval was used to declare statistical significance. **Results.** Modern contraceptive use among married reproductive-age women was 51.3% (95% CI: 47.0–55.6). Being from households with rich wealth index (AOR = 1.6; 95% CI: 1.1–2.5), a secondary or higher level of education (AOR = 3.0; 95% CI: 1.4–6.2), and desire to space (AOR = 2.6; 95% CI: 1.9–3.7) or want no more child (AOR = 2.4; 95% CI: 1.6–3.5) were found positively associated with modern contraceptive use. On the other hand, modern contraceptive use was negatively associated with women aged 35–49 years (AOR = 0.7; 95% CI: 0.5–0.9). **Conclusion.** Modern contraceptive use was relatively high in the Amhara region. The odds of modern contraceptive use were higher among women with secondary or more educational levels. Women from households with rich wealth index and those who want to delay or avoid pregnancy had also more odds of using modern contraceptives. Therefore, strengthening women's and community education could improve modern contraceptive use. Moreover, more emphasis should be given for income generation activities.

1. Background

Family planning (FP), defined as the ability of individuals and couples to have the number of children when they want, is a proven strategy to reduce maternal and child morbidity and mortality [1, 2]. Recent studies identified that contraceptive use can reduce almost 230 million births every year [3, 4]. Another study showed that contraceptive use alone

can reduce maternal mortality by 44% [5]. Despite these benefits, modern contraceptive (MC) use among married or in-union reproductive-age women remains low. According to the 2017 Global Report, MC use among these women was 58% globally and 32% in Africa [6]. In developing countries, about 214 million married or in-union reproductive-age women had an unmet need for MC in 2018 [7]. If the world fails to supply this demand, women pay the price of

unintended pregnancy and abortions, which can sometimes be unsafe. In 2015, almost half (44%) of global pregnancies were unintended and two-fifth of these pregnancies ended with abortion [8, 9].

Modern FP service was introduced to Ethiopia by the Family Guidance Association of Ethiopia in 1966. The FP service at this time was mainly awareness creation due to social and political constraints. In 1993, the country adopted the population policy, and in 1996, the minister of health released FP guidelines to guide stakeholders on family planning service provision [10]. In 2003, Ethiopia launched the health extension program. FP service is one of the 16 packages in this program [11]. Using this and other programs, the health sector transformation plan planned to increase the contraceptive prevalence rate (CPR) to 55% and reduce the unmet need to 10% by the end of 2020 at national and regional levels [12]. Regardless of these efforts, MC use is low and unmet need is high in Ethiopia. According to the 2019 Ethiopia Mini Demographic and Health Survey (EDHS) report, only 41% of married reproductive-age women were using MC [13]. Surveys in Ethiopia showed MC use varied by regions [14, 15].

Unintended pregnancy is a public health problem in Amhara regional state [16–19]. Almost one in four married women who want to delay or avoid pregnancy in the Amhara region was not using MC, and each woman experienced at least one unplanned birth [15]. Some studies in the Amhara region showed that contraceptive use is public health problem [20, 21], but studies about factors affecting MC use among married or in-union women are limited. The objective of this study, therefore, was to assess modern contraceptive use and its associated factors among married nonpregnant reproductive-age women in the Amhara region.

2. Methods

2.1. Data Source. We used secondary community-based cross-sectional regional representative 2016 EDHS data collected through a two-stage stratified cluster sampling technique from January 18, 2016, to June 27, 2016. The survey was implemented by the Central Statistical Agency (CSA) at the request of the Federal Minister of Health (FMOH) [15].

Initially, each region in the EDHS was stratified into urban and rural areas yielding 21 sampling strata. After strata, there were 84,915 enumeration areas. From these, a total of 645 enumeration areas (202 in urban areas and 443 in rural areas) were independently selected proportionally based on the 2007 Ethiopia Population and Housing Census [15]. The survey covered 17,067 households, yielding response rate 98%, and 15,863 women, yielding response rate 95%. All women aged 15 to 49 years who were either permanent residents of the selected households or visitors who stayed in the selected household the night before the survey were eligible for the study. Of these 15,683 women, 3714 were from Amhara regional state, contributes 22% of national women. The analysis was restricted to married or in-union women (2414) [15]. Women who were pregnant or

amenohearric at the time of the survey (207) also were excluded. Finally, 2207 nonpregnant married or in-union reproductive-age women were included in the final model (Figure 1).

2.2. Study Variables

2.2.1. Outcome Variables. The outcome variable for this analysis was modern contraceptive use, which has two categories (yes or no). The 2016 EDHS questionnaire asked all reproductive-age women involved in the survey whether they were using contraceptives including the type of contraceptive. A woman was considered “using modern contraceptives” if she reported that she was using sterilization (tuba ligation or vasectomy), intrauterine device (IUD), injectable, oral contraceptive (pills), or condom at the time of the survey.

2.2.2. Independent Variables. Demographic and socioeconomic variables are included in the analysis as predictor variables. Demographic variables included were as follows: age of women (15–34 or 35–49), family size (≤ 4 , 5–8, or ≥ 9), age at first marriage (15–18, 19–24, or ≥ 25), number of living children (0, 1–2, 3–4, or ≥ 5), number of children ever birth (0, 1–2, 3–4, or ≥ 5), ideal number of children (≤ 3 or > 3), future fertility preference (want more soon (within two years), want later (two years later), want time not decided, undecided, or want no more), knowledge on modern contraceptive (yes or no), and women’s religion (orthodox, Muslim) are included. Socioeconomic variables included were as follows: residence (urban or rural), women’s and partners’ educational status (no, primary, secondary, or above), women’s and partners’ occupation (not working or working), wealth index (poor, middle, or rich), exposure to FP messages on mass media (yes or no), and visits by health workers and health facility visit (yes or no). The exposure to FP messages on mass media was constructed from other data (if women heard or saw family planning messages from radio, television, magazine, or phone message). The poor wealth index category was created by merging poorer and poorest, and the variable rich was constructed by merging richer and richest.

2.3. Statistical Analysis. Weighted data were analyzed with a complex survey sampling analysis technique using STATA software version 14.1. Frequency distribution and descriptive statistics (mean \pm standard deviation (SD)) were used to describe the characteristics of the study participants. Chi-square analysis was also used to describe the relationship of independent variables and dependent variables. Bivariable and multivariable logistic regression analyses were done to identify factors associated with modern contraceptive use. Variables are significant with 95%, and p value ≤ 0.05 in the multivariable analysis was used to declare association. Multicollinearity with variance inflation factor was less than ten was checked before multivariable logistic regression

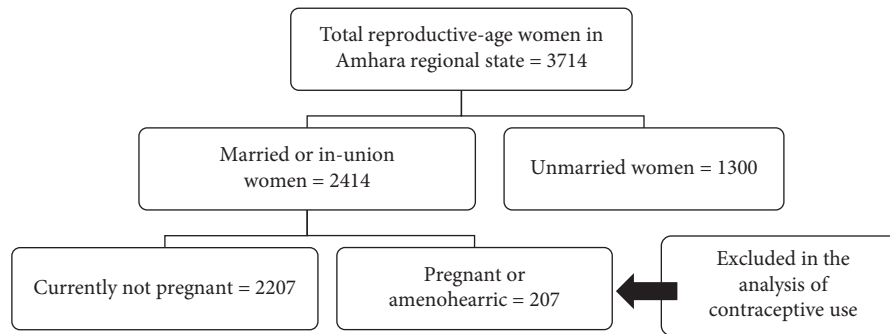


FIGURE 1: Schematic presentation to select women included in the analysis in Amhara region, Ethiopia 2016 EDHS.

analysis was done. The goodness of fit of the final model was tested by Hosmer–Lemeshow (p value >0.05).

3. Result

3.1. Sociodemographic and Other Characteristics of Women.

A total of 2207 reproductive-age married women were included in the analysis. The mean age of women was 32.0 years ($SD \pm 0.3$ years). About three-fifth (61.0%) of women were aged 15–34 years. About 15.8% of women were Muslim, with the rest orthodox (84.2%). The majority of women (84.2%) were rural residents. The majority of women (81.6%) were married or in-union before their 19th birthday. About two-thirds (69.1%) of women were not educated. Almost half (52.2%) of women reported that they visited a health facility, and only 31.6% of women were visited by health workers at home 12 months before the survey. Almost one-fourth (24.0%) of women reported that they heard or saw family planning messages through radio, television, magazine, or phone message.

About 89.4% of women were having at least one living child, of which about 28.6% had five or above living children. The mean number of living children was 3.3 children per woman ($SD + 0.1$ children). Thirty-seven percent of women reported that they want no more children and 19.1% want within two years (Table 1).

3.2. Contraceptive Use. Of all married reproductive-age women, half of them (51.3%) were using modern contraceptives and 0.5% were using traditional methods. Of modern contraceptive users, the majority of them (62.4%) were using injectable followed by implant/Norplant (25.8%). About two-thirds (67.5%) of women wanted to use contraceptives to limit or spacing their birth (Table 2).

3.2.1. Modern Contraceptive Use by Women's Characteristics.

Modern contraceptive use varied by women's age. The level of modern contraceptive use among women aged 15–34 years was 57.4% higher compared to women aged 35–49 years ($p < 0.001$). Modern contraceptive use also varied by women's educational status. About 76.1% of women with secondary or above educational level were using modern contraceptives higher compared to women with no education (45.9%) ($p < 0.001$). About two-thirds (65.7%) of

women whose husband with secondary or above educational level used modern contraceptives higher compared to women whose husband with no education (46.6%) ($p = 0.003$). Modern contraceptive use decreased as the number of living children increases. About 60.8% of women who had no living children used modern contraceptives compared to 36.6% of women who had five or more living children ($p < 0.001$). About 57.4% of women who received family planning messages used modern contraceptives compared to women not received messages (49.4%) ($p = 0.040$). About 56.0% of women who visited by health workers used modern contraceptives compared to 46.0% among women not visited by health workers ($p = 0.040$). There was no statistically significant difference in contraceptive use among married reproductive-age women by religion, occupation, residence, age at first marriage, visit a health facility, and partner occupation (Table 3).

3.2.2. Reason for Not Using Contraceptives. The most common reasons for nonuse of contraceptives among married reproductive-age women were thinking that contraceptives are fatalistic (17.6%), menses not returned (15.2%), on breastfeeding (9.1%), infrequent sex or have no sex (5.9%), and fear of side effect (3.0%).

3.2.3. Factors Associated with Modern Contraceptive Use.

On the bivariable analysis, age, age at first marriage, family size, exposure to FP message, educational status, wealth index, the ideal number of children, future fertility preference, visited by health workers, and residence were significantly associated with modern contraceptive use among married or in-union reproductive-age women. On multivariable analysis, age, future fertility preference, educational status, and wealth index were significantly associated. The odds of modern contraceptive use among women aged 35–49 years were 30% less compared to women aged 15–34 years ($AOR = 0.7$; 95% CI: 0.5–0.9). Women with a secondary or higher level of education had 3 times ($AOR = 3.0$; 95% CI: 1.4–6.2) higher odds of modern contraceptive use compared to women with no education. The odds of modern contraceptive use among women who belonged to the rich wealth index were 3 times higher compared to women who were in the poor wealth index category ($AOR = 3.0$; 95% CI: 1.4–6.2) (Table 4).

TABLE 1: Sociodemographic and other characteristics of married reproductive-age women in the Amhara region, EDHS 2016.

Variables	Weighted frequency (%)
Educational status	
No education	1.526 (69.1)
Primary	452 (20.5)
Secondary+	229 (10.4)
Occupational status	
Not working	863 (39.1)
Working	1.344 (60.9)
Wealth index	
Poor	780 (35.3)
Middle	530 (24.0)
Rich	897 (40.7)
Family size	
≤4	901 (40.8)
5–8	1.198 (54.3)
≥9	108 (4.9)
Age at first marriage	
≤18	1.801 (81.6)
19–24	335 (15.2)
≥25	71 (3.2)
Partner education	
No education	1.389 (62.9)
Primary	508 (23.0)
Secondary+	276 (12.5)
Do not know	34 (1.6)
Partner occupation	
Have no work	42 (1.9)
Have work	2.157 (97.8)
Do not know	8 (0.3)
Future fertility preference	
Want more soon	422 (19.1)
Want later	742 (33.6)
Want but time not decided	62 (2.8)
Undecided	116 (5.3)
Want no	816 (37.0)
Declared infecund	49 (2.2)
Number of children ever born	
0	229 (10.4)
1–2	630 (28.5)
3–4	567 (25.7)
≥5	781 (35.4)
Number of living children	
	233 (10.6)
	712 (32.2)
	631 (28.6)
	631 (28.6)
Ideal number of children	
	415 (18.8)
	1.477 (66.9)
	315 (14.3)

4. Discussion

4According to this analysis, 51.3% (95% CI: 47.0–55.6) of married or in-union reproductive-age women in Amhara regional were used modern contraceptives. Of which, 63.3% were for spacing and 36.7% for limiting. The majority of them (62.4%) were used injectable followed by implant/Norplant (25.8%).

TABLE 2: Contraceptive use among married reproductive-age women in the Amhara region, EDHS 2016.

Variables	Frequency (%)
Contraceptive demand	
Demand for spacing	880 (39.9)
Demand for limiting	610 (27.6)
Using contraceptives	
Using for spacing	721 (32.7)
Using for limiting	421 (19.1)
Current use by method	
No	1, 065 (48.3)
Traditional	10 (0.5)
Modern	1.32 (51.3)
Type of modern method used (n = 1132)	
Pill	49 (4.3)
IUD	72 (6.4)
Injectable	706 (62.4)
Condom	0 (0.0)
Sterilization	13 (1.1)
Implant	292 (25.8)

TABLE 3: Modern contraceptive use by sociodemographic characteristics of married reproductive-age women in the Amhara region, EDHS 2016.

Variables	MC use, n (%)	p value
Residence		
Urban	214 (61.5)	0.064
Rural	918 (49.4)	
Educational status		
No education	701 (45.9)	<0.001
Primary	257 (56.9)	
Secondary+	174 (76.1)	
Religion		
Orthodox	941 (50.6)	0.403
Muslim	191 (54.9)	
Occupational status		
Not working	431 (50.0)	0.540
Working	701 (52.2)	
Wealth index		
Poor	339 (43.4)	0.022
Middle	290 (54.7)	
Rich	504 (56.2)	
Family size		
≤4	501 (55.6)	0.026
5–8	591 (49.4)	
≥9	40 (37.1)	
Age at first marriage		
≤18	898 (49.9)	0.235
19–24	194 (57.8)	
≥25	41 (57.6)	
Partner education		
No education	647 (46.6)	0.106
Primary	289 (56.9)	
Secondary+	181 (65.7)	
Do not know	15 (44.0)	
Partner occupation		
Have no work	11 (27.9)	0.106
Have work	1118 (51.8)	

TABLE 3: Continued.

Variables	MC use, <i>n</i> (%)	<i>p</i> value
Do not know	2 (29.4)	
Future fertility preference		<0.001
Want more soon	155 (36.8)	
Want later	463 (62.4)	
Want but time not decided	32 (52.5)	
Undecided	67 (58.1)	
Want no	411 (50.4)	
Declared infecund	2 (4.9)	
Number of children ever born		<0.001
0	138 (60.5)	
1–2	371 (59.0)	
3–4	329 (58.0)	
≥5	294 (37.6)	
Number of living children		<0.001
0	141 (60.8)	
1–2	419 (58.9)	
3–4	341 (54.0)	
≥5	231 (36.6)	
Ideal number of children		<0.001
≤3	236 (56.9)	
>3	785 (53.2)	
Undecided	111 (35.1)	
Visit health facility		0.259
No	521 (49.4)	
Yes	611 (53.1)	

The overall level of modern contraceptive use was consistent with studies done in Northwest Ethiopia (51.3%) [22] and Sudan (51.5%) [23]. However, it was lower compared to the study done in the Oromia region, Ethiopia, 55.7% [24], and western Ethiopia (71.9%) [25]. The reason for this variation might be the educational status and cultural difference of study participants. About 89% of women in the study of western Ethiopia were educated. Conversely, the prevalence of modern contraceptive use was higher compared to the previous EDHS report [26], and other studies done in Ethiopia were as follows: North Shewa Zone (46.9%), Dabate (32.5%), Butajira (25.4%), Dembia District (31.7%), and southern Central Ethiopia 31.8%) [20, 21, 27, 28]. And it also higher compared to studies done in Ghana (21.5%) [29], Tanzania (34%) [30], Afghanistan (29%) [31], and FP2020 focus countries (45.7%) [32]. This variation might be attributed to the accessibility and availability of the family planning service provision, traditional beliefs, religious, and cultural differences of study participants [33, 34]. The most frequently mentioned reasons for not using modern contraceptives were fear of side effects, fatalistic, on breastfeeding, menses not returned, and infrequent sex or have no sex. The findings were consistent with other studies done in Ethiopia, Nigeria, and Saudi Arabia [35–38].

The proportion of women's modern contraceptive use increased with their husbands' educational level (0.003). This finding was consistent with other studies [22, 27, 28]. Increasing husband's education might be helpful in a discussion on family planning and family size would increase knowledge and utilization of modern contraceptive. Modern

TABLE 4: Factors associated with modern contraceptive use among married or in-union reproductive-age women in the Amhara region, Ethiopia 2016 EDHS.

Variables	COR (95% CI)	AOR (95% CI)
Age		
≤34	1	1
35–49	0.5 (0.4–0.7)	0.7 (0.5–0.9)*
Residence		
Urban	1	1
Rural	0.7 (0.4–1.0)	1.1 (0.7–1.9)
Age at the first marriage		
≤18	1	
19–24	1.4 (0.9–2.0)	1.0 (0.6–1.7)
≥25	1.4 (0.6–3.2)	1.1 (0.5–2.5)
Education status		
No education	1	1
Primary	1.6 (1.1–2.2)	1.3 (0.9–1.7)
Secondary+	3.7 (2.0–7.1)	3.0 (1.4–6.2)***
Wealth index		
Poor	1	1
Middle	1.5 (1.0–2.4)	1.6 (1.0–2.5)
Rich	1.7 (1.1–2.5)	1.6 (1.1–2.5)*
Visited by health workers		
No	1	
Yes	1.4 (1.1–1.8)	1.2 (0.8–1.6)
Exposed to FP message		
No	1	
Yes	1.4 (1.0–1.9)	0.8 (0.6–1.7)
Family size		
≤4	1	
5–8	0.8 (0.6–1.0)	1.0 (0.6–1.3)
≥9	0.5 (0.3–0.9)	0.6 (0.3–1.3)
Ideal number of children		
1–3	1	1
3–12	0.9 (0.6–1.2)	1.1 (0.8–1.6)
Undecided	0.4 (0.3–0.7)	0.6 (0.4–1.0)
Future fertility preference		
Want more soon	1	
Want 2 years later	2.7 (2.0–4.1)	2.6 (1.9–3.7)***
Want but time not decided	1.9 (0.9–4.1)	2.3 (1.0–5.4)
Undecided	2.4 (1.3–4.4)	3.2 (1.7–6.0)***
Want no more	1.7 (1.2–2.5)	2.4 (1.6–3.5)***
Declare infecund	0.1 (0.0–0.6)	0.1 (0.0–0.8)

* *p* value ≤0.05, ** *p* value ≤0.01, and *** *p* value ≤0.001.

contraceptive uptake was higher among women who reported that they were exposed to FP messages (through radio, television, magazine, or phone message) and visited by health workers at home 12 months prior to the survey (*p* = 0.040). This finding was consistent with other studies [14, 39–42]. The reason for this variation might be women received more information about family planning through mass media and during the discussion with the health workers, improving modern contraceptive methods and knowledge level along with increasing self-efficacy or empowerment in making better decisions regarding FP and contraceptive use [43]. The proportion of modern contraceptive use was higher among women who had four or less family sizes compared to women who had nine or above

family sizes. Similarly, contraceptive use decreased with the number of living children increase. This finding was consistent with other studies. The reason might be those women who had a large number of families and children were not educated, poor, and rural residents. Not educated women and women from rural residents and poor households are having a large ideal number of children [15]. The other reason might be that women who had a large family size and living children may be aged 40 years and declared infecund.

On multivariable analysis, the age of women, future fertility preference, educational status, and household wealth index were significantly associated with modern contraceptive use. Women with secondary or higher levels of education had more odds of using modern contraceptives compared to women with not educated. This finding was in line with other studies done in Ethiopia [20, 25, 28, 44–46], Sudan [23], Ghana [29, 47, 48], and Afghanistan [31]. The reason for this might be that women's education helps them to understand their rights and responsibilities on the reproductive and sexual issues. And also it enables them to discuss with their partners and make joint decisions on FP and family size. Women empowerment is essential to improve maternal health service uptake. Also, educated women are more likely to receive family planning-related messages from different sources. Furthermore, the positive effect of education on modern contraceptive use may be associated with the delay in marriage and first pregnancy [25, 34, 48–50].

This study revealed that women's future fertility preference was significantly associated with modern contraceptive use. The odds of modern contraceptive use among women who want no more children and want to space were higher compared to women want soon. This finding was in line with previous studies [22, 45]. The reason might be that women who decide to delay or avoid pregnancy are internally motivated to use modern contraceptives. Aged women (women aged 35 years or more) had lower odds of using modern contraceptives. This finding was in line with studies done in Ethiopia [14], Nigeria [51], and Mali [52]. The reason might be that older women preferred traditional methods to delay or limit the number of birth [34]. This may be one of the reasons why the prevalence of unplanned pregnancy is generally higher among older women compared to younger women [50].

Women from households with the wealth index rich had higher odds of using modern contraceptives compared to those with the poor wealth index. This finding was in line with studies conducted in Ethiopia [14], Nigeria [51, 53], Angola [54], Bangladesh [39], Ghana [55], and Mali [56]. The reason for this might be direct or indirect that the costs women may incur to access contraceptives. The other reason might be the biases and misconceptions related to contraceptive use. Women may believe that contraceptives are not favorable for women involved in laborious activities, in which poor women usually engage in. Exposure to family planning messages through mass media may be the other reason, which showed a significant association with contraceptive use in other studies [39–42], in which rich women are accessible for it.

5. Conclusions

Modern contraceptive use among married or in-union reproductive-age women was relatively high compared to other studies done in the region. Age of women, educational status, future fertility preference, and wealth index were statistically significant factors associated with modern contraceptive use. Strengthening women's and community education may improve modern contraceptive use. Health care providers should be given special attention for women aged 30 and 40 years when they provide family planning counseling. Also, more emphasis should be given to income generation activities.

Data Availability

The data used for this analysis are available in the repository (<https://dhsprogram.com/data>), upon permission from the DHS program.

Ethical Approval

The 2016 EDHS protocol was reviewed and approved by the Federal Democratic Republic of Ethiopia Ministry of Science and Technology and the Institutional Review Board of ICF International.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Authors' Contributions

MBA conceived, designed, and performed the analysis. GWD, GAF, and YMG were equally involved in the analysis, interpretation, and writing of the results. All authors read and approved the final manuscript.

Acknowledgments

The authors would like to acknowledge the DHS program for allowing to use the data.

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