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Emergency contraceptive knowledge and associated factors among abortion experienced reproductive age women in Ethiopia: a multilevel analysis using EDHS 2016 data

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Abstract

Background Emergency contraceptives (EC) are used to avoid unintended pregnancy, hence avoiding its incidence and its effects. In Ethiopia, emergency contraception is commonly accessible, especially in the big cities. However, there is virtually little understanding of or awareness of EC and Ethiopia has a high abortion rate. Therefore this study was aimed to assess the magnitude and associated factors for emergency contraceptive knowledge in Ethiopia.

Methods The study was based on secondary data analysis of the Ethiopian Demographic and Health Survey 2016 data. A total weighted sample of 1236 reproductive age women was included. A multilevel mixed-effect binary logistic regression model was fitted to identify the significant associated factors of emergency contraceptive knowledge. Statistical significance was determined using Adjusted Odds Ratio (AOR) with 95% confidence interval.

Results Overall magnitude of emergency contraceptive knowledge was observed to be 17.19% (95% CI: 15.18, 19.40) with intra-class correlation (ICC) 57% and median odds ratio (MOR) 6.4 in the null model. Women's age 25–34 (AOR = 2.6; 95% CI: 1.2, 5.5), and 35–49 (AOR = 1.5; 95% CI: 1.06, 3.3), secondary and above educational level (AOR = 3.41; 95% CI: 2.19, 4.88), media exposure (AOR = 2.97; 95% CI: 1.56, 5.64), Being in metropolitan region (AOR = 2.68; 95% CI: 1.46, 4.74), and women being in urban area (AOR = 3.19; 95% CI: 1.20, 5.23) were associated with emergency contraceptive knowledge.

Conclusion Emergency contraceptive knowledge in this study was low. Women age, educational level, media exposure, residency, and region were significantly associated with emergency contraceptive knowledge. Therefore, to enhance understanding and use of ECs in the current Ethiopian setting, it is imperative to ensure exposure to EC information, particularly in rural regions.

Keywords Emergency contraceptive, Knowledge, Multilevel, Ethiopia

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Background

Emergency contraceptives (EC) are the only method available to women to prevent pregnancy after unprotected sexual contact, a contraceptive failure, forgetting to take their birth control pills too late, or being forced to have sex against their will [1, 2]. EC is also known as “morning-after” or “post-coital” contraception [3]. EC is only intended for occasional or emergency use and should not be used as a regular method of contraception [4, 5]. previously, EC was thought to be effective only for 72 h, but recent studies have confirmed that it is effective for up to 120 h [3]. The copper-releasing intrauterine device (IUD) can be safely used for EC up to 5 days after unprotected intercourse, lowering the risk of pregnancy by more than 99% [6, 7].

EC is largely underutilized worldwide, and is considered one of the best kept secrets in reproductive medicine [8]. Globally, EC is not widely used. According to reports, 9.4% of Americans use it [9], in South Africa as 4% [10] and in Iran as 5.2% [11]. Additionally, studies have shown a lack of knowledge and attitude about emergency contraception among women [12]. Every year, approximately 250 million pregnancies occur worldwide [13, 14]. One-third of these pregnancies are unintended, with 20% ending in abortion. More than one-third of the 182 million pregnancies in low-income countries are unintended; of which 19% are terminated by induced abortion. Among this 11% of induced abortions are unsafe [15].

Because of the high unmet need for family planning and the consequences, many Ethiopian women face the difficulties of abortion and unwanted child birth. As a result, Ethiopia’s Federal Ministry of Health has authorized the distribution of EC in drug stores as well as the provision of safe abortion services in medical facilities for those who require the service under certain conditions such as rape, incest, sexual violence, and so on.

Throughout Ethiopia, EC pills can be found in any drug retails in a two dose oral pills that should be taken in 12 h apart. Based on the information on the leaflet distributed with the drug, the two doses should be taken within 72 h after exposure to unprotected sex. Despite the fact that EC is easily accessible from drug stores in Ethiopia’s major cities, the national abortion rate is quite high which account the average of 49 per 1,000 [16, 17].

Abortion, even when done safely, can be painful and cause psychological and physical stress. The paradox here is that, while EC services are widely available, why would women prefer to have an abortion in the face of potential complications? There are several reasons for this, but the most important is a lack of adequate knowledge about EC among the general public, particularly women.

However, specific developing countries have studied the knowledge of emergency contraceptive method among reproductive-age women, including Ethiopia

[18–21], Nigeria [22], South Africa [23], Nairobi [24] and Botswana [25]. There have been no studies that have used national EDHS representative data in Ethiopia. In addition, these previous studies failed to consider community level factors and their interaction with individual-level factors. Multilevel approaches will provide an understanding of factors affecting ECK at both the individual and community levels.

Therefore, this study aimed to assess the knowledge of emergency contraceptive and its associated factors among abortion experienced reproductive age women in Ethiopia. The findings of this study will be used to implement interventions to increase awareness and use of EC, thereby reversing the occurrence of unwanted pregnancy and its consequences.

Methods

Study design, period, and setting

A community-based cross-sectional survey was conducted using secondary data in the 2016 Ethiopian Demographic and Health Surveys (EDHS), which was conducted by the Central Statistical Agency (CSA) in collaboration with the Federal Ministry of Health (FMoH) and the Ethiopian Public Health Institute (EPHI), which was a national representative sample conducted from January 18 to June 27, 2016 [26]. There are nine regional states in Ethiopia (Tigray, Afar, Amhara, Oromia, Benishangul, Gambela, South Nation, Nationalities and Peoples’ Region (SNNPR), Harari, and Somali), and two administrative cities (Addis Ababa and Dire-Dawa). The data were gained from the official database of the EDHS program, www.measuredhs.com after authorization was granted via online request by explaining the purpose of our study. We extracted dependent and independent variables from the woman record (IR file). EDHS are a nationally representative household survey conducted by face-to-face interviews on a wide range of populations. Study participants were selected using a two-stage stratified sampling technique. Enumeration Areas (EAs) were randomly selected in the first stage, while households were selected in the second stage [27]. A total of weighted sample of 1236 abortion experienced reproductive age women were included.

Variables and measurements

Dependent variable

The outcome variable of this study was having correct knowledge of emergency contraceptive (EC), which was recoded and dichotomized. When collecting data from the women, they were asked “Do you know emergency contraceptive?” The different responses were: “yes”, “no”. This variable coding is provided by the EDHS [28].

Independent variables

Individual level variables Age of respondents, educational status of respondents, current marital status, occupation of respondents, wealth index, media exposure, Contraceptive use, sexually activity, and religion were included.

Community level variables Community level variables included residency and region were directly accessed from EDHS data sets. However, community level poverty, community level education, and community-level media exposure were constructed by aggregating individual-level characteristics at the cluster level [29]. They were categorized as high or low based on the distribution of the proportion values generated for each community after checking the distribution by using the histogram. The aggregate variable was not normally distributed and the median value was used as a cut-off point for the categorization [29, 30].

Media exposure

Media exposure was calculated by aggregating TV watching, radio listening, and reading newspapers and woman who have exposure to either of the media sources was

categorized as having media exposure and the rest considered as having no media exposure [31, 32].

Wealth index

The variable wealth index was re-categorized as “Poor”, “Middle”, and “Rich” categories by merging poorest with poorer and richest with richer [32–35].

Data analysis

For data analysis Stata version 16 software was used. To ensure the representativeness of the EDHS sample and obtain reliable estimations and standard errors, data were weighted (v005/1,000,000) throughout analysis.

Four models fitted: the null model with no explanatory variables, model I with individual factors, model II with community factors, and model III with both individual and community factors. To compare and assess the fitness of nested models, we used the intra class correlation coefficient (ICC), the median odds ratio (MOR), and deviation (-2LLR). Model III was the best-fitting model due to its low deviance. In multivariable analysis, variables with a p-value less than 0.2 in bivariable analysis were used. Finally, in the multivariable analysis, adjusted odds ratios with 95% confidence intervals and p-values less than 0.05 were used to identify factors of emergency contraceptive knowledge.

Table 1 Individual characteristics of respondents in Ethiopia (n = 1236)

Variables	Categories	Frequency	Percentage (%)
Age of respondents	15–24	153	12.35
	25–34	460	37.25
	35–49	623	50.40
Educational status of respondents	No formal education	759	61.39
	Primary education	409	33.07
	Secondary and above	68	5.54
Occupation of respondents	Working	710	57.48
	Not working	525	42.52
Current marital status	Married	1067	86.32
	Not married	169	13.68
Wealth index	Poor	451	36.50
	Middle	243	19.64
	Rich	542	43.86
Media exposure	Yes	542	43.85
	No	694	56.15
Contraceptive use	Yes	316	25.60
	No	920	74.40
Sexual activity	Yes	899	72.81
	No	336	27.19
Religion	Orthodox Christian	583	47.15
	Muslim	392	31.70
	Protestant	243	19.68
	Others+	18	1.48

Results

Individual level factors

Half (50.40%) of the women were aged between 35 and 49 years. Regarding their educational level, 759 (61.39%) respondents were reported as had no formal education. Among the participants, 710 (57.48%) were employed. About 86.32% of the respondents were married and 899 (72.81%) of participants were sexually active. Only one-fourth (25.6%) of participants used contraceptives. With regard to their economic status, 451 (36.5%) women were from the poor wealth quintiles and 542 (43.86%) were from the rich wealth quintiles. Moreover, 694 (56.15%) respondents had no media exposure. In addition 583 (47.15%) participants were Orthodox Christian (Table 1).

Community level factors

Of the study participants, 717 (57.99%) reproductive age women were from communities with high proportion of community level education. Majority (65.62%) of participants had no community media exposure. Among the respondents 522 (42.22%) were under high poverty level communities. Moreover, 1081 (87.51%) participants were from large central parts of Ethiopia (Table 2).

Random effects and model fitness

According to the intra-class correlation (ICC) in the null model, 57% of the overall variability of knowledge

Table 2 Community level characteristics of respondents in Ethiopia (n = 1236)

Variables	Categories	Frequency	Percentage (%)
Residency	Urban	259	21
	Rural	976	79
Community media exposure	Low	811	65.62
	High	425	34.38
Community level education	Low	519	42.01
	High	717	57.99
Community level poverty	Low	714	57.78
	High	522	42.22
Region	Metropolitan	102	8.25
	Large central	1081	87.51
	Small peripheral	52	4.24

Table 3 Model comparison and random effect analysis result in Ethiopia

Random effect	Null Model	Model I	Model II	Model III
Variance	6.2	4.7	3.5	2.2
ICC	57.21	43.67	39.23	31.05
MOR	6.4	5.6	4.8	3.8
PCV	Ref	24.2%	43.5%	64.5%
Model fitness				
Deviance (-2LLR)	1016	902	854	806

of emergency contraceptive can be attributed to cluster variability. The median odds ratio for knowledge of emergency contraceptive in the null model was 6.4, indicating that knowledge of emergency contraceptive varied between clusters. This suggests that if we randomly picked individuals from different clusters, those in the highest knowledge of emergency contraceptive cluster had a 6.4 times higher chance of having knowledge of emergency contraceptive than those in the lowest knowledge of emergency contraceptive cluster. Likewise, the proportional change in variance (PCV) increased from 24.2% in model I to 64.5% in model III (a model with individual and community variables), which indicates that the final model (Model III) best describes knowledge of emergency contraceptive variability. Deviance was also used to assess the fitness of the model. Model III was found to have the lowest deviation, so it was the best fitting model (Table 3).

Magnitude of emergency contraceptive knowledge among abortion experienced reproductive age women in Ethiopia

Overall, magnitude of emergency contraceptive knowledge among abortion experienced reproductive age women in Ethiopia was 17.19% (95% CI: 15.18, 19.40) (Fig. 1).

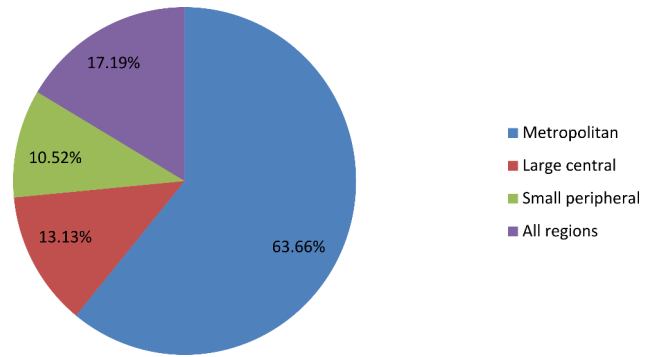


Fig. 1 Magnitude of emergency contraceptive knowledge among abortion experienced reproductive age women in Ethiopia, 2016 EDHS data

Factors associated with emergency contraceptive knowledge among abortion experienced reproductive age women in Ethiopia

In terms of individual level factors, the study showed that women aged 25 to 34 and 35 to 49 were more likely to have knowledge on emergency contraceptive (AOR=2.6; 95% CI: 1.2, 5.5), (AOR=1.5; 95% CI: 1.06,3.3) compared to 15 to 24 aged women respectively. The study found that women with a secondary and above educational level were 3.41 times more likely to have knowledge on emergency contraceptive (AOR=3.41; 95% CI: 2.19, 4.88) than those who had no formal education. The odds of emergency contraceptive knowledge was high among reproductive age women who had media exposure (AOR=2.97; 95% CI: 1.56, 5.64) compared with their counterparts. Regarding community level factors, women who were residing in urban area were 3.19 times to have emergency contraceptive knowledge than living in rural area (AOR=3.19; 95% CI: 1.20, 5.23). In addition, women in metropolitan region were 2.68 more likely (AOR=2.68; 95% CI: 1.46, 4.74) to have emergency contraceptive knowledge compared to women in small peripheral region (Table 4).

Discussion

The actual implication of inadequate emergency contraception knowledge is regarded as one of the primary and leading causes of induced abortion, spontaneous abortion, or stillbirth, because the majority of post-abortion women are practically immediately at risk for pregnancy. Therefore, this analysis had revealed knowledge of the emergency contraceptive and its associated factors among abortion experienced reproductive women in Ethiopia. A total of 1236 reproductive age women were included in the analysis and only 17.19% (95% CI: 15.18, 19.40) were found to be knowledgeable about emergency contraceptives. This study was lower than a study conducted in Drie Dawa (34.1%) [7], Tigray (40.4%) [36], Jima University (65.7%) [37], south Ethiopia (72.2%) [38], south eastern Nigeria (51.6%) [22], Tamale Ghana (69%)

[39]. However, this finding is higher in study conducted in Bangladesh (14%) [40]. This difference can result from the study's multilevel methodology or from sociocultural differences with respect to other nations. At the same time variations could result from differences in sample size, study design, and awareness of contraceptive options among different nations.

Knowledge of EC remained higher for the respondents aged 25 to 34 and 35 to 49 compared to their younger with (AOR=2.6; 95% CI: 1.2, 5.5), (AOR=1.5; 95% CI: 1.06, 3.3) 15 to 24 aged women respectively. This outcome was consistent with research from Deberemarkos, Adama, and Mekele Universities [41–43]. The rationale could be that as people get older, they are likely exposed to more information regarding emergency contraception.

The likelihood of EC knowledge increased as the level of education of the study participants increased. Those respondents with secondary & above were more likely to have EC knowledge compared to no formally educated women. This can be explained by the notion that women with higher levels of education have better access to health care information. Education has a favorable impact on women's ability to comprehend reproductive health issues and choose the optimal contraceptive technique for their individual health needs. Also, it raises women's status generally in terms of their knowledge, attitudes, and health-seeking behavior [44, 45].

Women who exposed to media were positively associated with emergency contraceptive knowledge. This result is in line with a study conducted in Dire Dawa [7]. A possible explanation is that the media has a powerful ability to explain different methods, their benefits and where they are available to women, enhancing women's knowledge of the emergency contraceptives.

This study revealed that women residing in urban areas had a higher knowledge of EC than that of rural areas. Similarly, a study in developing countries also revealed higher knowledge of EC in urban areas [46]. This can be explained by factors including low socioeconomic position, limited access to information, and poorer educational attainment in rural locations. In addition, in most regions, women in urban areas have better access to the Internet, media outlets, and healthcare providers than women in rural regions [47–49]. Many other reproductive health outcomes, like EC, were also better in cities [50, 51].

Moreover, women living in metropolitan region were 2.68 times more likely to have knowledge of emergency contraceptive compared to women in the small peripheral regions. This demonstrates that there was regional heterogeneity of knowledge of EC in Ethiopia, which was also found in another study [52].

The most recent nationally representative data included in this investigation were gathered using standardized

and established data gathering methods. Additionally, multilevel analysis (an advanced model) was used to account for the linked nature of the EDHS data in the estimation process. Despite the foregoing benefits, the study's cross-sectional design prevents it from demonstrating the causal link between the outcome and the independent factors.

Conclusion

Emergency contraceptive knowledge among abortion experienced reproductive age women in Ethiopia was low. Women age, educational status of mothers, media exposure, residency, and region were significantly associated with emergency contraceptive knowledge. The lower degree of EC knowledge indicates the need to take into account potential FP service structure modifications while formulating various policy-level initiatives. To enhance understanding and use of ECs in the current Ethiopian setting, it is imperative to ensure exposure to EC information, particularly in rural regions.

Table 4 Multivariable analyses for factors affecting emergency contraceptive knowledge among abortion experienced reproductive age women in Ethiopia (n = 1236)

Variables	Model 0	Model 1 AOR (95% CI)	Model 2 AOR (95% CI)	Model 3 AOR (95% CI)
Individual level Characteristics				
Age				
15–24	1			1
25–34	0.25 (0.12, 0.53)			2.6 (1.2, 5.5)*
35–49	0.15 (0.06, 0.33)			1.5 (1.06, 3.3)*
Educational status of the respondents				
No formal education	1			1
Primary education	2.03 (1.14, 3.6)			2.25 (0.98, 4.33)
Secondary and above	3.0 (2.19, 8.82)			3.41 (2.19, 4.88)*
Marital status				
Married	0.36 (0.17, 0.75)			0.42 (0.22, 1.077)
Not married	1			1
Media exposure				
Yes	3.51 (1.96, 6.29)			2.97 (1.56, 5.64)*
No	1			1
Wealth index				
Poor	1			1
Middle	0.91 (0.40, 2.07)			0.99 (0.43, 2.24)
Rich	1.19 (0.57, 2.48)			1.29 (0.62, 2.70)
Religion				
Orthodox Christian	1			1
Muslim	1.69 (1.05, 2.70)			0.32 (0.15, 0.66)
Protestant	2.20 (1.01, 4.85)			1.04 (0.50, 2.17)
Others+	2.20 (1.01, 4.85)			2.84 (0.44, 18.04)
Community level variables				
Residency				
Urban	2.0 (1.2, 5.00)			3.19 (1.20, 5.23)*
Rural	1			1
Community level education				
High			0.41 (0.22, 0.79)	1.35 (0.61, 2.96)
Low			1	1
Community media exposure				
Low			1	1
High			3.49 (0.33, 5.63)	1.25 (0.55, 2.82)
Region				
Metropolitan			2.05 (1.31, 3.24)	2.68 (1.46, 4.74)*

Table 4 (continued)

Variables	Model 0	Model 1 AOR (95% CI)	Model 2 AOR (95% CI)	Model 3 AOR (95% CI)
Large central			0.88 (0.28, 2.81)	1.29 (0.40, 4.11)
Small peripheral			1	1

* Statistically significant, AOR Adjusted Odds Ratio, COR Crude Odds Ratio
 Null model: adjusted for individual-level characteristics, Model 2: Adjusted for community-level characteristics, Model 3: adjusted for both individual and community level characteristics
 +Others=Catholic, traditional and other EDHS category

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Authors' contributions

TBB conceived the idea, extract the data, data analysis, and draft the manuscript. WDN, DGB, FMA, MHA, and DBA participate in the data analysis, interpretation, and revising of the manuscript. All authors have read and approved the final manuscript.

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Data Availability

Data for this study were sourced from Ethiopian Demographic and Health surveys (EDHS), which is freely available online at (<https://dhsprogram.com>).

Declarations

Ethical approval and consent to participate

The study does not involve participants to provide information. Consent to participants is not applicable since the data is secondary and is available in the public domain. All the methods were conducted according to the Helsinki declarations. More details regarding EDHS data and ethical standards are available online at (<http://www.dhsprogram.com>). The study is not experimental study. Further explanation of how the DHS uses data and its ethical standards can be found at: <http://goo.gl/ny8T6X>.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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