

# Unintended pregnancy and associated factors among pregnant women in Rural Ethiopia

## Abstract

**Background:** Unintended pregnancy is a worldwide problem that affects the health of women, families and relatives. This study was aimed to identify the major factors associated with unintended pregnancy among women in rural Ethiopia.

**Methods:** We used 2016 Ethiopian Demographic and Health Survey (EDHS) data on 853 rural pregnant women aged 15–49. Chi-square test was used to filter candidate independent variables to be included in a multivariable logistic regression. And the multivariable logistic regression model was employed to estimate the relative association of factors associated with unintended pregnancy.

**Results:** The prevalence of unintended pregnancy in study area was 20.9% (95% CI: 18.2, 23.8%). The unintended pregnancy was associated with region Afar (AOR: 0.308, 95% CI: 0.101, 0.943) and Somalia (AOR: 0.064, 95% CI: 0.012, 0.331), women aged 35 or older (AOR: 2.016, 95% CI: 1.014, 4.009), women who had primary education (AOR: 0.284, 95% CI: 0.190, 0.425) and secondary/higher education (AOR: 0.201, 95% CI: 0.123, 0.329), Women who knew about contraceptives (AOR: 0.481, 95% CI: 0.379, 0.610), and parity 1 or 2 (AOR: 0.782, 95% CI: 0.750, 0.815).

**Conclusion:** About one-fifth of the pregnancies were unintended. Region, age, educational level, knowledge about contraceptive and parity were significantly associated factors of unintended pregnancy. Providing health education to women needs to be encouraged.

**Key Words:** Unintended pregnancy, pregnant women, rural Ethiopia

## 1. INTRODUCTION

Unintended pregnancy is defined as pregnancy that is either mistimed (pregnancy that occurred earlier than the desired time) or unwanted totally (pregnancy that occurred when no more children were desired) [1]. Sexual activity without using contraception through choice or coercion is the predominant cause of unplanned pregnancy [2].

Unintended pregnancy is a worldwide problem that affects the health of women, families and society [3]. Around About 26.5 million unplanned pregnancies happened annually due to the incorrect use or failure of contraceptives globally [4]. In developing countries, unintended pregnancy accounted for 65% of all pregnancies and 59% of these pregnancies end with abortion [5].

Unintended pregnancy results in maternal mortality and morbidity because of the complications of unplanned births, unsafe abortion, and miscarriage which has a negative impact on health, economical and psychosocial costs to individual and society as well as significant emotional distress to women, families, and society [6]. The unintended pregnancy's impact is higher during the adolescent period, which levy to dropping out of

**Comment [FCCW1]:** State the statistical package used for analysis. Also indicate the level of significance to enhance understanding of the significant variables in the next subheading -results. Suggestion: the level of significance is  $p < .05$  or  $p \leq .05$  whichever applies to your work

**Comment [FCCW2]:** Kindly report the p-values to ease understanding of the variables that are statistically significant (associated with unintended pregnancy)

**Comment [FCCW3]:** You may complete the sentence. ...for .....or in order to....

**Comment [FCCW4]:** You may use 'occur' instead of happened

**Comment [FCCW5]:** Use one

school, unstable and lack of proper management of family relationships [7]. In developing countries around 22000 women lost their lives because of the complication of abortion annually [8].

**Comment [FCCW6]:** Rephrase to ease flow. Suggestion: The impact of unintended pregnancy ..... resulting in .....

According to 2016 Ethiopian Demographic and Health Survey (EDHS) report, in Ethiopia, 25% of all births in the past five years and current pregnancies were unintended [9]. In Ethiopia, 24.7% and 42% of unintended pregnancy were caused by contraceptive failure and not using contraceptive methods respectively [10].

Unintended pregnancy is affected by various factors such as educational status, knowledge on contraceptives, use of contraceptive methods, marital status, residence, religion, number of living children, age, parity, working status, economic status, family size, ~~No-number~~ of births in past 5 years [11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31].

**Comment [FCCW7]:** In text references appears too many. Suggestion: you may insert the reference(s) close the individual factors where applicable or 11-31

~~Now-days~~ Nowadays, one of the intervention areas for minimizing maternal mortality is preventing unintended pregnancy [32]. Identifying factors associated with unintended pregnancy is essential to inform the policy makers for the provision of safe and reliable service to reproductive-aged women. Hence, this study was aimed to identify factors associated with unintended pregnancy among pregnant women in rural Ethiopia based on 2016 Ethiopian Demographic and Health Survey data.

## 2. **METHODS**

### 2.1. **Data source**

This study used the 2016 Ethiopian demographic and health survey (EDHS) data, which was collected from January 18 to June 25, 2016. The 2016 EDHS was designed to provide estimates for the health and demographic variables of interest at national and regional level.

**Comment [FCCW8]:** Add the study design, population and ethical consideration

### 2.2. **Variables in the study**

#### 2.2.1. **Dependent variable**

Dependent variable is unintended pregnancy. The pregnancy is intended if it is planned at ~~a~~ the time of survey and unintended if it is not planned at ~~a-the~~ time of survey or it is not planned at all.

**Comment [FCCW9]:** Was permission obtained for transfer and /or use of data set?

#### 2.2.2. **Independent variables**

Region, age, religion, marital status, educational status, husband/partner education, household wealth index, family size, working status, knowledge of contraceptive, sex of household head, parity, number of births in past five years, and ever terminated pregnancy

### 2.3. **Statistical Data Analysis**

The data were analysed using statistical packages SPSS version 25. Frequencies and percentages were used to summarize the background characteristics of the women. And the Pearson's chi-square test of association was used to filter the significant independent variables that are associated to the dependent variable unintended pregnancy. A binary logistic regression model was fitted to fit the predictor variables associated with the

**Comment [FCCW10]:** At first use you may state the full meaning before using abbreviation. Suggestion: .....Statistical Product and Service Solutions (SPSS) formerly known as Statistical Package for the Social Sciences

unintended pregnancy. The model goodness of fit was checked using the Hosmer and Lemeshow test.

**Comment [FCCW12]:** Hosmer-Lemeshow goodness-of-fit

### 3. RESULTS

#### 3.1. Prevalence of unintended pregnancy

The overall prevalence of unintended pregnancy among pregnant women in rural Ethiopia was 20.9% (95% CI: 18.2, 23.8%).

#### 3.2. Background characteristics of pregnant women

Of all 853 women included in the study, 138(16.2%) of them were living in Oromia region. Nearly half (48.3%) of women were in the age range of 25-34 years. More than three fifth (65.4%) of the women did not attend the formal education. Majority (97.2%) of them were in married/ living together at a time of survey. Majority (63.9%) of the women were from the households with the poor wealth index. Nearly three fifth (58.4%) of the women were Muslim religion followers. 254(29.8%) women had five or more ever born children. Majority (620(72.7%)) of women had 3 to 4 births in the last five years. More than three fourth (719(84.3%)) women were from household headed by males. More than half (490(57.4%)) of women were from family of size 5 or less. Only 86(10.1%) women ever had a terminated pregnancy. Majority (713(83.6%)) of women know about the contraceptive (Table 1).

Table 1: Background characteristics of pregnant women in Ethiopia (n=853)

Variables	Frequency (%)
<b>Region</b>	
Tigray	66(7.7)
Afar	114 (13.4)
Amhara	82(9.6)
Oromia	138(16.2)
Somalia	135(15.8)
BenshangulGumuz	73(8.6)
SNNPR	128(15.0)
Gambela	41(4.8)
Harari	50(5.9)
Dire Dawa	26(3.0)
<b>Age(years)</b>	
15-24	308(36.1)
25-34	412(48.3)
≥25+	133(15.6)
<b>Educational level</b>	
No education	558(65.4)
Primary	249(29.2)
Secondary/Higher	46(5.4)
<b>Marital status</b>	

**Comment [FCCW13]:** Write meaning in table foot note

**Comment [FCCW14]:** Non formal instead of 'no education'

Never in union	7(0.8)
Married/living together	829(97.2)
Widowed/divorced/separated	17(2.0)
<b>Wealth index</b>	
Poor	545(63.9)
Middle	138(16.2)
Rich	170(19.9)
<b>Religion</b>	
Orthodox	188(22.0)
Protestant	142(16.6)
Muslim	498(58.4)
Others	25(2.9)
<b>Parity</b>	
0	125(14.7)
1-2	246(28.8)
3-4	228(26.7)
5+	254(29.8)
<b>Number of births in last five years</b>	
No births	196(23.0)
1-2	620(72.7)
3-4	37(4.3)
<b>Sex of household</b>	
Male	719(84.3)
Female	134(15.7)
<b>Family size</b>	
5 or less	490(57.4)
More than 5	363(42.6)
<b>Ever had a terminated pregnancy</b>	
No	767(89.9)
Yes	86(10.1)
<b>Knowledge about contraceptive</b>	
No	140(16.4)
Yes	713(83.6)

### 3.3. Unintended pregnancy by characteristics of women

Among 178 women who had unintended pregnancy, 48 (27.0%) of them were living in Oromia region at a time of survey. 51.1% of the unintended pregnancy occurred among women who were in the age groups of 25 to 34 years. 111(62.4%) unintended pregnancy occurred among women who did not attend formal education. 104(58.4%) unintended pregnancy occurred among women with poor wealth index. 78(43.8%) unintended pregnancy occurred among Muslim ~~religion follower women~~. 69(38.8%) unintended pregnancy occurred among women who had ever born 5 or more children. 150(84.3%) unintended pregnancy occurred among women who had 1 or 2 births in last five years. 90(50.6%) unintended pregnancy occurred among women from families of size 5 or less. 160(89.9%)

**Comment [FCCW15]:** It appears better not to begin a sentence with 'figure' you may correct all through.

unintended pregnancy occurred among women who had no ever terminated pregnancy. 62(34.8%) unintended pregnancy occurred among women who did not know contraceptive methods (Table 2).

Table2: Unintended pregnancies by characteristics of women in Ethiopia (n = 853)

Variables	Unintended pregnancy		Chi-square value (significance) (p-)
	Yes (%)	No (%)	
<b>Region</b>			83.250(0.000)
Tigray	14(7.9%)	52(7.7%)	
Afar	8(4.5%)	106(15.7%)	
Amhara	21(11.8%)	61(9.0%)	
Oromia	48 (27.0%)	90(13.3%)	
Somalia	2(1.1%)	133(19.7%)	
BenshangulGummuz	10(5.6%)	63(6.3%)	
SNNPR	45 (25.3%)	83(12.3%)	
Gambela	11(6.2%)	30(4.4%)	
Harari	10(5.6%)	10(5.9%)	
Dire Dawa	9(5.1%)	17(2.5%)	
<b>Age</b>			19.035(0.000)
15-24	44(24.7%)	264(39.1%)	
35-34	91(51.1%)	321(47.6%)	
≥25+	43(24.2%)	90(13.3%)	
<b>Educational level</b>			9.869(0.020)
No education	111(62.4%)	447(66.2%)	
Primary	59(33.1%)	190(28.1%)	
Secondary/ Higher	8(4.5%)	38(5.7%)	
<b>Marital status</b>			0.257(0.880)
Never in union	1(0.6%)	6(0.9%)	
Married/living together	173(97.2%)	656(97.2%)	
Widowed/divorced/separated	4(2.2%)	13(1.9%)	
<b>Wealth index</b>			4.285(0.117)
Poor	104(58.4%)	441(65.3%)	
Middle	29(16.3%)	109(16.1%)	
Rich	45(25.3%)	125(18.5%)	
<b>Religion</b>			20.306(0.000)
Orthodox	50(28.1%)	138(20.4%)	
Protestant	42(23.6%)	100(14.8%)	
Muslim	78(43.8%)	420(62.2%)	
Others	8(4.5%)	17(2.5%)	
<b>Parity</b>			22.692(0.000)
0	9(5.1%)	116(17.2%)	
1-2	45(25.3%)	201(29.8%)	
3-4	55(30.9%)	173(25.6%)	
≥5+	69(38.8%)	185(27.4%)	
<b>Number of births in last five years</b>			15.675(0.000)
No births	22(12.4%)	174(25.8%)	
1-2	150(84.3%)	470(69.6%)	
3-4	6(3.4%)	31(4.6%)	
<b>Sex of household</b>			1.906(0.167)
Male	156(87.6%)	563(83.4%)	
Female	22(12.4%)	112(16.6%)	

Comment [FCCW16]: Write the full meaning in the table foot note for ease of understanding

Comment [FCCW17]: Delete '%' through out

Comment [FCCW18]: 'Non formal'instead of 'no education'

Comment [FCCW19]: Please,present the row percentages instead of column

<b>Family size</b>			4.359(0.037)
5 or less	90(50.6%)	400(59.3%)	
More than 5	88(49.4%)	275(40.7%)	
<b>Ever had a terminated pregnancy</b>			0.000(0.988)
No	160(89.9%)	607(89.9%)	
Yes	18(10.1%)	68(10.1%)	
<b>Knowledge about contraceptive</b>			14.380(0.000)
No	62(34.8%)	78(11.6%)	
Yes	116(65.2%)	597(88.4%)	

Comment [FCCW20]: check

### 3.4. Factor associated with unintended pregnancy

The multivariable logistic regression analysis showed that region, age, education, parity and knowledge about contraceptive were significantly associated factors with unintended pregnancy.

The odds of unintended pregnancy among women who were living in Afar region and Somali region were 0.308 (AOR: 0.308, 95% CI: 0.101, 0.943) and 0.064 (AOR: 0.064, 95% CI: 0.012, 0.331) respectively times lower than women who were living in Tigray region respectively. Women aged 35 or older (AOR: 2.016, 95% CI: 1.014, 4.009) were more likely to have unintended pregnancy than women aged 15-24 years. Women who had primary education (AOR: 0.284, 95% CI: 0.190, 0.425) and secondary/higher education (AOR: 0.201, 95% CI: 0.123, 0.329) were less likely to have unintended pregnancy than women who did not attend formal education. Women who had 1 or 2 ever born children (AOR: 0.782, 95% CI: 0.750, 0.815) were less likely to have unintended pregnancy than women who had no children. Women who knew about contraceptives (AOR: 0.481, 95% CI: 0.379, 0.610) were less likely to have unintended pregnancy than women who did not know about contraceptives (Table 3).

Table 3: Factors associated with unintended pregnancy in rural Ethiopia from multivariable logistic regression analysis

Variables	AOR	(95% CI for AOR)		p-value
<b>Region</b>				
Tigray	1			
Afar	0.308	0.101	0.943	0.029*
Amhara	1.234	0.548	2.781	0.611
Oromia	2.038	0.866	4.798	0.103
Somalia	0.064	0.012	0.331	0.001*
BenshangulGumuz	0.535	0.196	1.462	0.223
SNNPR	2.134	0.917	4.967	0.179
Gambela	1.315	0.447	3.869	0.618
Harari	0.894	0.298	2.684	0.842
Dire Dawa	2.103	0.640	6.912	0.221
<b>Age</b>				
15-24	1			
35-34	1.241	0.574	2.686	0.583

Comment [FCCW21]: pls see previous comment

Comment [FCCW22]: It appears better to leave it in one column and report as 0.101,0.943. If using two columns label as lower limit and upper limit

35+	2.016	1.014	4.009	0.025*
<b>Educational level</b>				
No education	1			
Primary	0.284	0.190	0.425	0.022*
Secondary/ Higher	0.201	0.123	0.329	0.007*
<b>Religion</b>				
Orthodox	1			
Protestant	0.704	0.361	1.372	0.302
Muslim	0.743	0.401	1.377	0.345
Others	1.183	0.415	3.370	0.753
<b>Parity</b>				
0	1			
1-2	0.782	0.750	0.815	0.010*
3-4	0.512	0.185	1.419	0.129
5+	0.293	0.073	1.169	0.081
<b>Number of births in last five years</b>				
No births	1			
1-2	2.619	0.574	11.947	0.214
3-4	1.813	0.520	6.317	0.350
<b>Family size</b>				
5 or less	1			
More than 5	0.981	0.606	1.588	0.938
<b>Knowledge about contraceptive</b>				
No	1			
Yes	0.481	0.379	0.610	0.036*

\*=significant at 5% level of significance

#### 4. DISCUSSION

The prevalence of unintended pregnancy among pregnant women in the study area was 20.9%, (95% CI: 18.2, 23.8%). This finding was in line with studies conducted in Gondar (20.6%)[27]. However, it is higher than the [finding of a](#) study conducted in FelegeHiwot referral hospital, Bahir Dar (13.7%) [33], whereas it is lower than the study conducted in Angola (38.3%) [34], Uganda (37%) [35], Welkaite Woreda (26%) [36], Kersa (27.9%) [37], Debre Birhan (23%) [10], Nepal (54.5%) [38], Arsi Negele Woreda (41.5%) [25]. The variation in the prevalence might be due to socio-demographic and cultural differences of participants and health service coverage.

In this study, the factors that were significantly associated with unintended pregnancy were region, age, education, parity and knowledge about contraceptive.

Women living in Afar and Somalia were less likely to have unintended pregnancy compared to women living in Tigray region. This finding is consistent with a study conducted in Ethiopia [18] and Ghana [39]. This might be due to fertility desire difference as Afar and Somalia are underdeveloped regions where the pregnancies may be appreciated and accepted compared to Tigray region in the context of Ethiopia.

Women aged 35 and above were more likely to have unintended pregnancy than women aged 15-24 years. This is consistent with the studies in Jimma [28], sub-Saharan Africa [31],

Comment [FCCW23]: May use 'but' for ease of 'flow'

ArsiNegele Woreda [25]. This might be due to that when women get older, they may not want bear children. But this is inconsistent with study in Kenya [14] and Brazil [40] which found that young women were more likely to experience unintended pregnancy than older women.

**Comment [FCCW24]:** Kindly rephrasesuggestion:.... the fact....

Women who had primary education and secondary/higher education were less likely to have unintended pregnancy than women who did not attend formal education. This is consistent with the studies in Ethiopia [41], Ghana [39] and sub-Saharan Africa [31]. The might be due to the fact that educated women may know about the methods of preventing the pregnancies compared to uneducated women. Similarly, Women who knew about contraceptives were less likely to have unintended pregnancy than women who did not know about contraceptives. This is consistent with the studies in Jimma [28] and sub-Saharan Africa [31].

Women with parity of 1 or 2 were less likely to have unintended pregnancy than women who had no children. This is consistent with the studies in Arsi Negele Woreda [25], Debre Birhan [10], Ethiopia [12, 18, 26, 41] and six south Asian countries [15]. This might be because of that women who have had children may care about the next pregnancy.

## 5. CONCLUSIONS

The study was aimed to identify factors that are associated with unintended pregnancy among pregnant women in Ethiopia based on EDHS 2016 data. Region, age, educational level, knowledge about contraceptive and parity were significant factors associated with unintended pregnancy among pregnant women in Ethiopia. Providing health education to women is important to prevent unintended pregnancy.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical approval was not applicable

## CONSENT FOR PUBLICATION

Not applicable.

## ABERRATIONS

AOR: Adjusted odds ratio

CSA: Central Statistical Agency

DHS: Demographic and Health Survey

EDHS: Ethiopian Demographic and Health Survey

SNNPR: Southern Nations, Nationalities and People's Region

WHO: World Health Organization

## COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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