

Women's Desire to Limit Child-Bearing and its associated factors in rural Ethiopia: A Multilevel Analysis

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Abstract

Introduction: Ethiopia is twelfth and the second most populous country in the world and Africa respectively. The fertility level of Ethiopia is high especially in rural areas. Rapid population growth had a significant negative impact on the economic performance of the country. Women desire to limit child bearing is one of the most important issue that bears directly on population growth.

Objective: the aim of this study was to assess women desire to limit childbearing and its associated factor among rural women

Methodology: We have used a cross-sectional survey dataset of Ethiopian demographic and health survey 2016. A total of 12,019 rural women were included in the study. A mixed effect binary logistic regression was used to identify determinants of women's desire to limit childbearing. Adjusted odds ratio with its corresponding 95% confidence interval was used to declare statistically significant variables.

Result: Women in the age group of 25- 34 years (AOR=1.61, 95% CI=1.28,2.13), 35- 49 years (AOR=4.96, 95% CI = 3.64, 6.65), women who had no children (AOR=0.06, 95% CI =0.04, 0.09) , having children 1-3 (AOR=0.29, 95% CI = 0.23, 0.36), married women (AOR=0.45, 95% CI=0.27, 0.75), living in small peripherals region (AOR=0.33,95% CI=0.24, 0.45) and community level poverty (AOR=0.72, 95% CI= 0.57, 0.89) were significantly associated with women's desire to limit child bearing.

Conclusion: there is low desire to limit childbearing in rural Ethiopia. Women who are older and wlarge number of children were more desire to limit child bearing. Whereas those married women, from small peripheral regions and with high community poverty proportion were less likely to limit child bearing. Therefore, providing education about benefit of small family size and providing family planning service may important to enhance women desire to limit their childbearing.

Introduction

The current world population reached 7.9 billion as of March 2022 (1). Among the top ten fastest-growing countries/regions, nine are located in Africa (2).

Ethiopia is one of the fastest-growing countries in the world with an estimated population of 119,750,048 as of March 10, 2022, and an annual growth rate of 2.57%. The total population of the country accounts for 1.47% of the total world population and 8.37% of the total African population. This represents Ethiopia being the twelfth and the second-most populous country in the world and in Africa respectively. Of the total population in Ethiopia, the majority (78.7%) is found in rural areas. If Ethiopia follows its current rate of growth, its population will double in the next 30 years (3, 4).

High fertility can impose costly burdens on developing nations like Ethiopia. It may impede opportunities for economic development, increase health risks for women and children, and erode the quality of life by reducing access to education, nutrition, employment, and scarce resources such as potable water (5). It also had a significant negative impact on the economic performance of the country (6).

In addition increase in childbearing or fertility affect the health of the mother which might end with death. According to Ethiopian Demographic Health Survey (EDHS) 2016, the pregnancy-related mortality ratio (PRMR) was 412 deaths per 100,000 live births. This showed that for every 1,000 live births in Ethiopia during the 7 years before the 2016 EDHS, approximately four women died during pregnancy, childbirth, or within 2 months after childbirth. Moreover, of 1,000 women of the exact age of 15, about 21 (one per 48 women) would die before age 50 during pregnancy, childbirth, or within 2 months of childbirth (7).

Despite the national efforts made to decrease the total fertility rate from 7.7 children per woman in 1990 to approximately 4.0 by the year 2015 through expanding clinical and community-based contraceptive distribution services (8), the total fertility rate level of Ethiopia, especially in rural areas is still high. Based on EDHS 2016 survey, the total fertility rate for rural and urban Ethiopia was 5.2 and 4.6 respectively and the prevalence of contraceptive rate (CPR) for married women age 15–49 is reported to be 36% (7).

Moreover, EDHS 2016 found that; the total wanted fertility rate (TWFR) in Ethiopia is 3.6 children, as compared with the actual total fertility rate of 4.6 children. In other words, on average, women in Ethiopia have one child more than they wanted. This suggests that TFR is approximately 28% higher than it would have been if unwanted births had been avoided (9).

Based on the 2005 and 2011 EDHS results the desire to limit childbearing among married women decreased from 41.4% in 2005 to 36.9% in 2011 in a rural parts of Ethiopia (10, 11).

The proportion of women who intend to limit child bearing is one of the most important conditions that bear directly on population growth and designates a segment of the population that may be at risk of having an unwanted birth. The continuing high fertility rate in Ethiopia resulting high rate of population growth is a considerable concern that makes improvements in living standards difficult. Thus, understanding the factors which influence women's desire to limit childbearing is critical for countries like Ethiopia with a population policy aiming at reducing fertility which will be important to develop effective strategies for fertility control. Therefore, this study aimed to assess women's desire to limit childbearing and its associated factors in rural Ethiopia.

Methodology

Study design, setting and data source

The data was obtained from the Demographic and Health Survey (DHS) program's official database website (<https://dhsprogram.com>). The 2016 EDHS data was used for this study. The Ethiopian demographic and health survey (EDHS) was a cross sectional survey and conducted in nine regional states and two city administrations subdivided into 68 zones, 817 districts, and 16,253 kebeles in the administrative structure of the country. EDHS 2016 uses a two-stage stratified cluster sampling and had selected 645 Enumeration areas (EAs). In this study, a weighted sample of 12,019 rural women was included and those who are infertile and sterilized women were excluded from the study.

Study variables

The outcome variable of the study is women's desire to limit childbearing. The DHS asks whether a woman wants to have another child soon, after two years, or wants no more children. Based on the response to these questions, it was categorized as a dummy variable (yes/no) which is the first category (yes) indicates that women who desire to limit childbearing, and the second category (no) refers to those women who want a child within two years, after two years and those who want a child but were not sure of the timing or desire to have more children. Women who are sterilized and declared infertile were excluded from the study.

Independent variable of the study includes individual-level variables such as the age of women, wealth index, marital status, education level, media exposure (exposure to TV, radio, or newspaper at least once a week), and occupation/working status.

Community-level variables: regions categorized as large central regions (Tigray, Amhara, Oromo, and South Nations and Nationalities), small peripheral regions (Afar, Somali, Gambella, and Benishangul Gumz), and metropolis (Dire Dawa, Harar, and Addis Ababa). The other community variables were created from individual-level variables which include community-level media exposure (high/low), community-level illiteracy proportion (high/low), and community poverty (high/low). These variables were created as high and low based on a median value of 50% since the distribution was not normally distributed.

Data processing and analysis

Data were cleaned and categorized using Stata version 16. Missing data was managed and method of complete case analysis was done. Descriptive statistics by considering weighting using women's sample weight, frequency, mean, and standard deviation were done for each variable of the study. The result was reported using text, tables, and graphs. Bi-variable binary logistic regression was done and those variables' p-value less than or equal to 0.25 were entered into multivariable multilevel logistic regression. Four models model I /Null model, model II (with community-level variables), model III (with individual-level variables), and model IV (with both community and individual level variables) were fitted step by step. Model comparison was done by LLR, AIC, and BIC. The best-fitted model was selected which is a model with a larger LLR, lowest AIC, or BIC. Adjusted Incidence Rate Ratio (AIRR) with 95% CI was used to declare statistically significant predictors.

Result

Individual and community-level characteristics of study participants

A total of 15683 women in Ethiopia were asked about their fertility desire among these a weighted sample of 12019 rural women was selected for this study. Those women who are sterilized and infertile were not included. The majority 4,675(38.9%) of respondents

were in the age group of 15-24 and the rest were 4,063(33.8%) in the age group of 25-34 and 3,281(27.3%), in the age group of 35-49. Regarding marital status, more than half 8,259 (68.72%) of respondents were married, 2,663 (22.15%) were not married, and 1,097 (9.13%). Around 4,619 (38.43%) women were orthodox, 4,160(34.62%) Muslim, 2,941(24.47%) protestant, and the remaining were others. Near to half 5,269(43.84%) of women were poor, 2,898(24.11%) were middle and 3,852(35.02%) were rich. More than half 6,773 (56.36%) of women were not educated and the rest 35.8% and 7.82% had primary and secondary education respectively. Majority of women 10,258 (85.35%) had no media exposure such as newspaper, TV and radio (Table1).

Table 1

Weighted individual and community-level characteristics of study participants, EDHS 2016 (N = 12,019)

Variables	Categories	Frequency (%)
Educational status	No education	6,773(56.36)
	Primary	4,306(35.8)
	Secondary and above	940(7.82)
Working status	Not working	8,663 (72.08)
	Working	3,356 (27.92)
Region	Larger central	11,373 (94.62)
	Small peripherals	605 (5.04)
	Metropolis	41 (0.34)
Media exposure	No	10,258 (85.35)
	Yes	1,761 (14.65)
Number of living children	No	3,444 (28.65)
	1-3	4,053 (33.72)
	4 and above	4522 (37.62)
Knowledge of family planning method	No	237 (1.97)
	Yes	11,782 (98.03)
Family planning use	No	6,980 (58.07)
	Yes	5,039 (41.93)
Family planning a professional visit	No	8,998 (74.86)
	Yes	3,021 (25.14)
Family planning message	No	9,565 (79.58)
	Yes	2,454 (20.42)
Fertility preference	No	8,048 (66.96)
	Yes	3,971 (33.04)
Community media exposure	Low	6,247 (51.97)
	High	5,772 (48.03)
Community illiteracy proportion	Low	6,678 (55.56)
	High	5,341 (44.44)
Community-level poverty	Low	7,859 (65.39)
	High	4,160 (34.61)

Desire to limit childbearing

The proportion of women who desired to limit childbearing in rural Ethiopia was 3,971(33.04%), (95% CI=32.2%, 33.9%)

Factor associated with women's desire to limit childbearing

Among those variables entered in multivariable analysis, age of women, number of children, marital status, and region and community level wealth index were significantly associated with women's desire to limit childbearing in rural Ethiopia.

Women in the age group of 25- 34 years of age are 1.61 times (61%) more likely to have a desire to limit childbearing (AOR=1.61,95% CI=1.28,2.13) as compared to their counterparts. Similarly in the age range 35- 49 years, they are 4.92 times (AOR=4.96, 95% CI = 3.64, 6.65) more likely to limit childbearing. The other important significant factor which contributed to women's desire to limit childbearing was the number of children. A woman who had no children was 94% less likely to limit childbearing (AOR=0.06, 95% CI =0.04, 0.09), and having children 1-3 also decreased women's desire to limit childbearing by 71% (AOR=0.29, 95% CI = 0.23, 0.36) as compared to those who have 4 and more children. Regarding marital status, married women were less likely to limit child bearing and decreased desire by 57% (AOR=0.45,95% CI= 0.27, 0.75).

The region of the country was a significant predictor of limiting childbearing. Women who were living in small peripherals regions of Ethiopia such as Afar, Somali, Gambella, and Beninshangul Gumz were less likely or decreases the desire to limit childbearing by 0.33 times or 67% (AOR=0.33,95% CI=0.24, 0.45) as compared to those in large central regions of Ethiopia. Lastly, community level poverty proportion was significantly associated with limiting child bearing. Those community with high poverty proportion were less likely to limit child bearing that was decreased by 28 % (AOR=0.72, 95% CI= 0.57, 0.89) as compared to those with low proportion (Table2).

Table 2

Mixed effect binary Logistic regression analysis showing factors associated with women's desire to limit childbearing, EDHS 2016

Variables	Categories	Desire		Model II(community level)	Model III(individual level)	Model IV (full model)
		No	Yes			
		No	Yes	-		
Age group	15-24	4,205	470	-	Ref	Ref
	25-34	2,744	1,319	-	1.65(1.28,2.13)*	1.61(1.25,2.09)*
	35-49	1,100	2,181	-	5.08(3.76, 6.86)*	4.92(3.64,6.65)*
Education level	no education	3,826	2,947	-	Ref	Ref
	Primary	3,379	927	-	0.98(0.79,1.20)	0.96(0.78,1.18)
	Secondary and above	843	97	-	0.71(0.45,1.12)	0.71(0.45,1.12)
Wealth index	Rich	2,572	1,280	-	Ref	Ref
	Middle	3,492	1,777	-	0.82(0.67,0.99)*	0.83(0.68,1.01)
	Poor	1,984	914	-	1.08(0.87,1.35)	1.20(0.96,1.51)
Religion	Orthodox	2,978	1,641	-	1.01(0.58,1.76)	1.004(0.58,1.74)
	Protestant	1,968	973	-	0.95(0.55,1.64)	0.92(0.53,1.59)
	Muslim	2,888	1,272	-	0.71(0.39,1.27)	0.86(0.48,1.52)
	Other	214	85	-	Ref	Ref
Media exposure	Yes	1,276	485	-	Ref	Ref
	No	6,772	3,486	-	1.04(0.78,1.40)	1.06 (0.79, 1.43)
Number of children	No	3,201	243	-	0.063(0.04, 0.10)*	0.06 (0.04, 0.09)*
	1-3	3,040	1,013	-	0.30(0.24, 0.37)*	0.29(0.23, 0.36)*
	4 and above	1,807	2,715	-	Ref	Ref
Knowledge of FP	Yes	7,856	3,926	-	Ref	Ref
	No	192	45	-	0.62(0.31, 1.25)	0.91(0.45,1.86)
Marital status	Not married	2,449	213	-	Ref	Ref
	Married	5,079	3,181	-	0.43(0.25,0.72)*	0.45(0.27,0.75)*
	Widowed/divorced	520	577	-	1.47(0.91,2.39)	1.52(0.94,2.47)
Use of FP	Yes	2,976	2,063	-	Ref	Ref
	No	5,072	1,908	-	0.91(0.76, 1.10)	0.96(0.79,1.15)
FP professional visit in the last 12 months	Yes	1,865	1,156	-	Ref	Ref
	No	6,183	2,815	-	1.002(0.85,1.18)	1.01(0.85, 1.19)
Working status	Working	2,097	1,259	-	Ref	Ref

	Not working	5,951	2,712	-	0.86(0.71, 1.04)	0.86(0.71, 1.04)
Region	larger central	7,511	3,862	Ref	-	Ref
	Small peripherals	510	95	0.39(0.32, 0.49)*	-	0.33(0.24,0.45)*
	Metropolis	27	13	0.99(0.79, 1.26)	-	1.21(0.89,1.64)
Community illiteracy proportion	Low	4,486	2,191	Ref	-	Ref
	High	3,562	1,780	1.11(0.94,1.30)	-	0.89(0.71,1.11)
Community media exposure	Low	4,068	2,179	Ref	-	Ref
	High	3,980	1,792	0.88(0.75,1.02)	-	0.91(0.73,1.12)
Community-level poverty	Low	5,187	2,672	Ref	-	Ref
	High	2,861	1,299	0.91(0.77,1.08)	-	0.72(0.57,0.89)*
Ref= Reference, *= Statistically Significant Variables						

Community-level variance and model fitness

The community level variance of null and full model was 0.27 and 0.38 respectively. This indicated that the variance was greater than zero showing the areas were heteroginous. Regarding model comparision the best fitted model was full model or amodel with individual and community level variables.The fitted model had low AIC/BIC and high LLR as compared to previous model (Table 3).

Table 3

Community-level variance of multilevel (mixed effect) model predicting women's desire to limit childbearing, EDHS 2016

Random effect	Null model	Full model
Community level variance	0.27	0.38
PCV	Reference	15.6
MOR)	1.34	1.59
ICC (%)	7.6	1.05
AIC	14895.38	11078.94
BIC	14909.83	11259.48
LLR	-7445.69	-5514.47

Discussion

A total weighted sample of 12,019 women of reproductive age rural women was included whereas 218 women were excluded from this study.

In this study, the overall proportion of women who desired to limit childbearing was 3,971(33.04%). The DHS report showed that the proportion who wants no more children ranges from 3 percent in Chad to 71 percent in Brazil(12). This finding was lower than studies conducted in Northern Malawi (41%), Oromia region (44.9%), other studies Oromia region based on EDHS (47%), Pakistan (47%), and Aksum (69.2%)(9, 13-17). Similarly, Our study finding was lower than a study conducted in Nepal more than 80% expressed no desire to have more children(18). But higher than the study conducted based on EDHS 2011(30%) and sub-Saharan Africa (31%)(19, 20).

This study's result is also higher than the study conducted in rural Mozambique (28%)(21). The possible variation in the prevalence of limiting childbearing may be due to differences in the study setting and sample size.

Regarding the factors, in multivariable analysis, five variables were significantly associated with the dependent variable. The factors are the age of women, the number of children, marital status, region, and community-level wealth index were significantly associated with women's desire to limit childbearing in rural Ethiopia.

The age of women was positively associated with the desire for limiting childbearing. As age increases women have more intention to limit childbearing which is supported by study conducted in Aksum(14). This is also comparable with study results in Northern Malawi, Pakistan, and Oromia region that women with the intention to limit childbearing were older (13, 15, 17, 22). Another study conducted in Ethiopia based on EDHS 2011 supported that as women were old, their desire for no more children also increased(19). Whereas a study conducted in Kenya showed that the desire to stop childbearing is rare among younger women(23).

Regarding the number of children, this study found, that women with a large number of children were more likely to want to limit childbearing. This is consistent with a study in Ethiopia, Oromia region, and Kenya that the desire to stop childbearing altogether increases with the number of children (13, 19, 23-25). Similarly, another study conducted in Ethiopia showed that the desire for more children or intentions to limit childbearing depended on the number of children women already had(15, 25).

Another significant predictor of limiting childbearing was marital status. Based on this study's findings, women who are married were less likely to be limited than those who are never married. But no significant difference among those who are widowed or divorced as compared with those who are not married. This finding was comparable with the study conducted in Malawi that women who are married are less likely to desire to limit childbearing (26). But a study conducted in Sweden showed that marital status was not significantly associated with childbearing intentions (27).

Regions of the country were significantly associated with women's desire to limit childbearing. This was supported by a DHS report that the desire to stop childbearing is dramatically different among countries and regions of the developing world (12). Similarly study in Malawi showed that the region of residence is significantly related to the desire to limit children(26). Another study conducted in Malawi also showed that the region was significantly associated with fertility intention (28).

Women with a high proportion of community-level poverty proportion were less likely to limit childbearing. This study finding was supported by many studies (13, 19, 25). It might be because women with a low wealth index considered their children as a high benefit economic value and an investment who pay back during their old age(25).

Limitation of the study

This study was conducted based on secondary data which is sourced from EDHS 2016 data. This study was cross sectional survey. Therefore the limitation of this study is temporal relationship can't be determined.

Conclusion

This study's findings showed that there is a low desire to limit childbearing as compared with other countries. Women who are older and have large family sizes were more desirable to limit childbearing whereas those married women, from small peripheral regions and with high community poverty proportion were less likely to limit childbearing.

Women of childbearing age who want no more children are an important predictor of fertility levels and trends. Therefore, providing education about the benefit of small family size and providing family planning services may be important to enhance women's desire to limit their childbearing

Abbreviations

AIC: Akaike Information Criteria

AOR: Adjusted Odds Ratio

BIC: Bayesian Information Criteria

DHS: Demographic and Health Survey

EA- Enumeration Area

EDHS: Ethiopian demographic health survey

FP: Family Planning

ICC: Intra-Class Correlation

PCV: Proportional Change in Variance

Declarations

Ethics approval and consent to participate

Not applicable

Consent for publication

Not applicable

Data availability

The data used for this analysis is available online on DHS program website (<http://www.measuredhs.com>) and available at the hand of all authors.

Conflict of interest

All authors declared that there is no competing interest

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Not applicable

Authors' contributions

AA: conceptualized the study and was involved in the design, analysis, interpretation, and manuscript writing.

SB, TK, and EA: data analysis, manuscript writing, and editing

BG, SA, and AT: manuscript writing and editing

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