

Determinants of High Fertility Rate among Married Women in Ethiopia

Setegn Muche Muche (✉ setegn14@gmail.com)

Debre Tabor University

Shewayiref Geremew Gebremichael

Debre Tabor University

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Abstract

Background: Fertility is one the major components of changing the population size and structure over time. Hence, this study aims to identify the socioeconomic and demographic factors associated with the high fertility rate among married women in Ethiopia

Method: Ethiopian demography and health survey of 2016 data were accessed and used for the analysis. A total of 9602 married women were included in the study. Poisson regression models were employed by considering the number of children ever born (count) as a response variable.

Results: A total of 9602 married women were included and 907 (9.4%) of the mothers have not born a child in their life time and only 307 (3.2%) of them have born more than 9 children. Rich women (IRR =0.794; 95%CI: 0.685, 0.920, secondary and above education of women (IRR =0.602; 95%CI: 0.570, 0.635), secondary and above education level of husbands' (IRR =0.917; 95%CI: 0.880, 0.955) and late marriage (IRR =0.853; 95%CI: 0.832, 0.873) were found significantly associated with low level of fertility rate. Small family size (IRR =2.23.; 95%CI: 2.168, 2.294) and being child death experience (IRR =1.636; 95%CI: 1.601, 1.672) were also showed statistically significant association with high level of fertility rate.

Conclusion: The government should focus on providing better access to education, increasing the coverage of family planning service and improving sources of income. Furthermore, the society should be made aware on consequences of high fertility on the child and maternal health, household economy, human capital investment and environmental degradation.

Introduction

Fertility is one the major components of changing the population size and structure over time. The world has experienced significant fertility declines over the past six decades. Total fertility at the global level fell from an average of 5 births per woman aged 15–49 year in 1950–1955 to 2.5 births per woman in 2010–2015. Among the world's regions, Africa remained the region with the highest fertility, averaging 4.7 births per woman in 2010–2015, with particularly high levels of fertility, on average 5.1 births per women, observed in sub-Saharan Africa[1, 2].

From 2017 to 2050, it is expected that half of the world's population growth will be concentrated in just nine countries including Ethiopia. Ethiopia is currently the 12th most populous countries worldwide and the 2nd in Africa. The current population of Ethiopia is over 112 million. This is equivalent to 1.45% of the world population. The country is projected to be among the top eight countries in the world with the greatest population increase between 2017 and 2050, with the total population estimated to rise to over 190 million [3–5]. The fertility has been slightly declined in Ethiopia over time, from 4.8 children per woman in 2011 to 4.6 children per woman in 2016[6–8]. Fertility is consistently higher among rural women, who give birth to nearly three more children during their reproductive years than urban women (5.2 versus 2.3 children per woman). Women in more remote and less developed regions give birth to

more children than do women in the more developed regional states. The fertility rate is highest in Somali (7.2 children per woman) and lowest in Addis Ababa (1.8 children per woman)[3, 6].

The impact of high fertility rate has on health is reflected mainly in a rise in the rates of maternal and child mortality. In addition, Poverty, war and famine, weak infrastructure, and low agricultural and industrial production have exacerbated the problem of overpopulation [9, 10]. So, understanding the factors responsible for the fertility level would help in designing strategies to effectively implement any program to tackle uncontrolled fertility. The common factors associated with fertility were (residence, wealth index, education of mother and father, working status mother, region, religion and age at first birth, use of contraception, family size and child death)[11–15]. However, previous studies in Ethiopia have done small geographical areas like regional level as well as district area and limited number of variables [12, 13, 16–23]. Therefore, this study was aiming to identify the factors associated with high fertility among married women in Ethiopia.

Methods

Data sources

The data used for this study was taken from the 2016 EDHS which is a nationally representative survey of women's age (15-49 years age) groups taken from the Central Statistics Agency (CSA), Ethiopia. The survey is the fourth compressive survey designed to provide estimates for the health and demographic variables of interest for the whole urban and rural areas of Ethiopia as a domain. In all of the selected households, measurements were collected from children age 0-59 months, women age 15-49 years, and men age 15-59 years old.

Variable of the study

Dependent Variable

The dependent variable in this study was the total number of children ever born per mother **Independent Variables**

The independent variable were residence, wealth index, education level of mother, education level of father, occupation of mothers, region, religion age at first marriage, contraceptive use, family size and child death.

Data analysis

The data analyses were performed using R version 3.5.3 software. Descriptive statistics were used to explore the entire variables of the study. Poisson regression model have been used to determine the significant variables associated with high fertility rate. P-values of less than or equal to 0.05 were considered as statistically significant.

Results

Trend of fertility from 2000 to 2016 in Ethiopia

The fertility rate has been slightly declined in Ethiopia over time. The fertility rate in Ethiopia for the period of 2000, 2005, 2011 and 2016 were 5.5, 5.4, 4.8 and 4.6 children per woman, respectively. The trends show an encouraging progress with fertility rate being reduced from 5.5 children per women in 2000 to about 4.6 children per women in 2016. This is equivalent to the reduction rate of 0.9 children per women for the period of 16 years (Figure 1).

Figure 1: Fertility rate per woman in Ethiopia (2000-2016)

A total of 9602 married women were included and 907 (9.4%) of the mothers have not born a child in their life time and only 307 (3.2%) of them have born 10 and more children (Table 1).

Table 1: Frequency distribution of number of children ever born per mothers

Number of children ever born	Frequency	Percentage (%)
0	907	9.4
1	1454	15.1
2	1408	14.7
3	1241	12.9
4	1077	11.2
5	952	9.9
6	778	8.1
7	699	7.3
8	476	5.0
9	303	3.2
10+	307	3.2
Total	9602	100.0

Demographic and socio-economic characteristics of fertility

The average children ever born in Ethiopia were 3.79 with standard deviation of 2.77. The highest average children ever born were occurred in Somali (4.77) and the lowest were, in Addis Ababa (1.99). The average children ever born for uneducated husbands (4.61) were two times higher than husbands with secondary and above education (2.28). The average children ever born in rural area (4.55) were higher than in urban (2.50). Women's were from poor households (4.30) have the highest average children ever born as compared to rich households (3.13). In addition, working women (3.59) have lower average children ever born as compared to housewife women (3.89).

Farther more, the average children ever born from mothers whose age at first marriage greater than 17 (2.96) is lower as compared to mothers whose age at first birth is less than or equal to 17(4.25). The average children ever born were higher for mothers with no education (4.80) and not contraceptive use (4.04) among their respective groups (Table 2).

Table 2: Summary statistics of predictor variables related to fertility in Ethiopia.

Variables	Categories	Frequency (%)	Average per woman	Std. Dev.
Number of children	-	9602	3.79	2.77
Region	Tigray	935 (9.74)	3.86	2.81
	Afar	858 (8.94)	3.77	3.02
	Amhara	1114(11.60)	3.73	2.68
	Oromia	1286(13.39)	4.23	2.79
	Somali	973(10.13)	4.77	3.05
	Benishangul	791(8.24)	4.11	2.77
	SNNPR	1198(12.48)	4.27	2.71
	Gambela	686(7.14)	3.12	2.20
	Harari	568(5.92)	3.14	2.44
	Addis Ababa	625(6.51)	1.99	1.49
	Dire Dawa	568(5.92)	3.20	2.67
	Residence	Urban	2369(24.67)	2.50
Rural		7233(75.33)	4.22	2.81
Women's occupation	Housewife	6542(68.13)	3.89	2.79
	Working	3060(31.87)	3.59	2.70
Have a dead child	No	7051(73.43)	2.95	2.32
	Yes	2551(26.57)	6.12	2.55
Women's education	No education	5625(58.58)	4.80	2.74
	Primary	2621(27.30)	2.71	2.29
	Secondary+	1356(14.12)	1.73	1.52
Household size	Less or equal to 4	3519(36.65)	1.78	1.68
	Greater than 4	6083(63.35)	4.96	2.60
Wealth index	Poor	4354(45.34)	4.30	2.85
	Middle	1342(13.98)	4.08	2.72
	Rich	3906(40.68)	3.13	2.55
	No	6715(69.93)	4.04	2.89

Contraceptive use	Yes	2887(30.07)	3.22	2.35
Age at first marriage	<=17 years	6231(64.89)	4.25	2.79
	>17 years	3371(35.11)	2.96	2.52
Husband's education	No education	4454(46.39)	4.61	2.84
	Primary	3002(31.26)	3.66	2.62
	Secondary+	2146(22.35)	2.28	2.04

Factors associated with Fertility in Ethiopia

Here under factor associated with fertility were presented using Poisson regression model. Region was significantly associated with fertility. The fertility rate of mothers live in Affar regions was 0.853 times (IRR =0.583; 95%CI: 0.805, 0.903) less likely as compared to mothers in Tigray. Similarly, the fertility rate of mothers live in Gambela regions was 0.895 times (IRR =0.895; 95%CI: 0.841, 0.952) less likely as compared to mothers in Tigray. Women live in rural had 1.058 times (IRR =1.058; 95%CI: 1.018, 1.100) more children compared to those lived in the urban area.

The result indicated that family size and experience of child death were significant factor of fertility. Mothers who were members of a larger family size (five plus) had about 2.23 times (IRR =2.23.; 95%CI: 2.168, 2.294) higher fertility compared to those who belonged to smaller family size. Similarly, mothers who had lost at least one of their children had about 63.6 percent (IRR =1.636; 95%CI: 1.601, 1.672) higher fertility compared to mothers who never had an experience of child death.

The result also showed that wealth index and mother's education level were significant associated factor of fertility. The rich women had about 0.794 times (IRR =0.794; 95%CI: 0.685, 0.920) lower fertility as compared to the poor women. In addition, women who had primary education were 0.759 times (IRR =0.759; 95%CI: 0.737, 0.782) lower fertility than women who have no education. Women who had secondary and above education were 0.602 times (IRR =0.602; 95%CI: 0.570, 0.635) lower fertility than women who have no education.

Moreover, the fertility rate of mothers who have husbands attended primary education was decreased by 6.7% (IRR =0.933; 95%CI: 0.909, 0.957) as compared to husband's who have no education. Similarity, the fertility rate of mothers who have husband attended secondary and above education was decreased by 8.3% (IRR =0.917; 95%CI: 0.880, 0.955) as compared to husband's who have no education. Women married before the age of 18 had more children than those who marry later. Women who use contraceptives have significantly lower fertility rates than women who do not use (Table 3).

Table 3: Parameter estimates of Poisson regression model

Variables	IRR	95% CI of IRR	p-value
Intercept	2.064	1.944, 2.190	<.0001*
Region			
Tigray (ref)			
Afar	0.853	0.805, 0.903	<.0001*
Amhara	0.895	0.855, 0.937	<.0001*
Oromia	0.982	0.935, 1.031	0.4665
Somali	1.053	0.996, 1.113	0.068
Benishangul	0.999	0.948, 1.053	0.9832
SNNPR	1.009	0.959, 1.063	0.7207
Gambela	0.895	0.841, 0.952	0.0005*
Harari	0.959	0.899, 1.023	0.2044
Addis Ababa	0.934	0.869, 1.004	0.0659
Dire Dawa	0.930	0.872, 0.993	0.0297*
Residence			
Urban (ref)			
Rural	1.058	1.018, 1.100	0.0041*
Mother occupation			
House wife (ref)			
Working	1.019	0.995, 1.043	0.1183
Have a dead child			
No (ref)			
Yes	1.636	1.601, 1.672	<.0001*
Mother's education			
No education (ref)			
Primary	0.759	0.737, 0.782	<.0001*
Secondary and above	0.602	0.570, 0.635	<.0001*
Household size			
Less or equal to 4 (ref)			

Greater than 4	2.230	2.168, 2.294	<.0001*
Wealth index			
Poor (ref)			
Middle	0.999	0.968, 1.031	0.9663
Rich	0.794	0.685, 0.920	0.0020*
Contraceptive use			
No (ref)			
Yes	0.973	0.948, 0.998	0.0362*
Age at first Marriage in years			
<=17 years (ref)			
>17 years	0.853	0.832, 0.873	<.0001*
Husband's education			
No education (ref)			
Primary	0.933	0.909, 0.957	<.0001*
Secondary and above	0.917	0.880, 0.955	<.0001*

Note: ref: reference category of the categorical variable;

* Significant at 5% level of significance

Discussion

The objective of this study was to identify socioeconomic and demographic determinants of high fertility in Ethiopia. According to the result, parental education level is an important socio-economic predictor of fertility, that is, fertility rate decreases with increase in parental education level. This result is lined with the previous study, the higher level of maternal and husbands education, the lower fertility [11, 12, 14, 16, 22, 24, 25].

The result revealed that there are clear regional variations of fertility levels in Ethiopia. Addis Ababa has very low fertility which is below replacement level of fertility. But, other regions like Somali, Oromiya and SNNP regions have high total fertility rates. This finding is coincide with other studies[25, 26]. This may be due to different distribution and access of family planning services.

This study showed that the number of children from poor households was higher than children from rich households, and this is in agreement with other studies [11, 15, 25]. This may indicate that parents in poor households use children as a source of income. The findings also showed that women in rural areas

have higher fertility rates than urban women. This is consistent with the study done in Ethiopia[12, 16]. This result also consistent with the study done in Nigeria[11] and Bangladesh[14], which found that fertility rate is higher in rural areas. This may show that rural woman have a negative feelings towards smaller number of children and having little access to family planning as well as knowledge of using contraceptive method is low.

Age at first marriage has significant bearing on the number of children ever born alive. Those women who get married at early age leads to high fertility rate. This finding is coincide with other studies [12, 22, 24, 27], which found that the incidence of fertility was low as increasing the age of marriage. Participants who had never used contraceptive had more children as compared to their counterparts. This is evidently clear that the aim of contraceptive method is to limit the number of children. Study conducted in Hwassa Town, Ethiopia[16] reported that use of contraception was statistically significant with low fertility. Other studies also reported women who were using contraception tended to have fewer children than those women not using a contraceptive [11, 14, 22, 28].

The results of this study also show that the child death was found to have positive association with fertility. The fertility for women who had at least one child loss experience is higher than women who had no child loss experience. This finding is coincide with other studies [13, 22]. Working status of a woman was believed to affect the number of children ever born. The results show that women who were working or employed had fewer children than that house wife. This is in line with [12, 14, 24], in which working mother is associated with lower fertility rates.

The study also revealed that household size is an important variable that affects the number of children ever born. Larger family size had higher fertility compared to those who belonged to smaller family size which is consistent with study in Butajira, Southern Ethiopia[13]. This might be due to when household member are large; they have enough time for their children to give care and expand.

Conclusion

The number of children ever born alive in Ethiopia is high. This study was revealed rural women, poor women, uneducated mother, uneducated husband, housewife mother, early married women, none contraceptive users, small family size and presence of child death were significantly associated with high fertility rate. Therefore, the government should focus on providing better access to education, increasing the coverage of family planning service and improving sources of income. Furthermore, the society should be made aware on consequences of high fertility on the child and maternal health, household economy, human capital investment and environmental degradation.

Limitations

Some variables are not included because of large number of missing values like age at first birth and sex preference. In addition to this, the interaction term is not considered under this study due to convergence

issue.

Declarations

Authors' contribution

SM analyzed the data and drafted the paper. SG revised subsequent draft of the paper. Both authors read and approved the final manuscript.

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Competing Interests

The authors declare that no competing interests exist.

Availability of data and materials

The survey datasets used in this study was based on publicly available dataset that is freely available online with no participant's identity from <http://www.dhsprogram.com/data/available-datasets.cfm>.

.Consent for publication

Not applicable.

Ethics approval and consent to participate

The consent to participate was obtained from the research participants during the original data collection process. The original data were collected in confirmation with international and national ethical guidelines. The purpose of current analysis was sent to DHS organization. Permission to download and use the data was obtained from the DHS organization.

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Authors' information

Affiliations

Department of Statistics, Debre Tabor University, Debre Tabor, Ethiopia

Setegn Muche Fenta, Shewayiref Geremew Gebremichael

Corresponding author

Correspondence: setegn14@gmail.com

Abbreviations

CSA
Central Statistics Agency; CI: Confidence Interval; EDHS: Ethiopian Demographic and Health Survey; IRR: Incidence Rate Ratio; SNNP: South Nations Nationalities and Peoples of Ethiopia;

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Figures

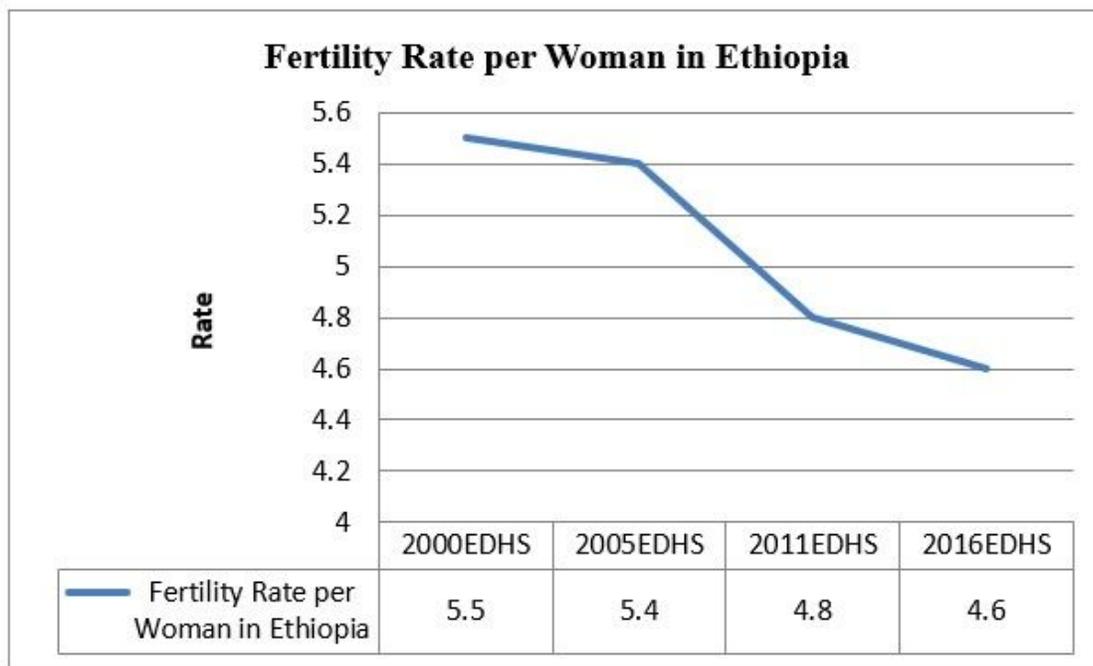


Figure 1

Fertility rate per woman in Ethiopia (2000-2016)