DETERMINANTS OF HIGH FERTILITY AMONG MARRIED WOMEN IN ANGACHA DISTRICT, KAMBETA TEMBERO ZONE, SOUTHERN ETHIOPIA

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ABSTRACT

BACKGROUND:

Fertility is the major component of population dynamics, which is used to show a major role in the size, and structure of a particular population. In Ethiopia, total fertility rate is 4.6 children per woman. This high fertility brings a significant problem on the health of mothers and children.

OBJECTIVE: To identify the determinants of high fertility in Angacha District, Southern Ethiopia.

METHOD:

A community-based case-control study design was conducted from September 20 to October 10, 2017 in Angacha district, Southern Ethiopia. A total of 388 married women in Angacha district were selected using simple random sampling technique. Bi-variable and multi-variable logistic regression analyses were performed.

RESULT:

A total of 388 eligible women (129 cases and 259 controls) requested to interview, of which 126 cases and 255 controls participated. Educational status of women (AOR[95% CI] = 0.36 [0.16-0.83]), desire to have more children before marriage (AOR[95% CI] = 0.51[0.28, 0.93]), age at first marriage (AOR[95% CI] = 4.77[2.59, 8.78]), history of under-five mortality (AOR[95% CI] = 4.22[2.43, 7.31]) and not ever use of contraceptive methods (AOR[95% CI] = 4.55[2.21, 9.39]) were identified as determinants of high fertility.

CONCLUSION:

In this study educational status of women, age at first marriage, desire to have children before marriage, not ever use of contraceptive methods and experiencing under-five mortality were identified as determinants of high fertility. Therefore, all concerned bodies should intervene in improving the education level of women, increase age at first marriage, reduce child mortality and improve the access to contraceptive methods.

KEYWORDS: High Fertility, Married Women, Angacha, Southern Ethiopia

INTRODUCTION

Fertility is one of the elements in population shifting aspects that has significantly contributed to changing the population size and structure over time[1,2]. Evidence showed that, throughout the world, the total fertility rate is declining from an average of 4.7 children per woman in 1970-1975 to 2.6 children per woman in 2005-2010. But, this reduction mostly occurred in developed countries. The decline was less marked among unindustrialized countries where fertility seated high, in such countries, fertility dropped from 6.3 children per woman in 1970-1975 to 4.4 in 2005-2010[3].

The high fertility has resulted in rapid population growth of 2.5 percent per year in the world. It is projected that 7.2 billion world populations in 2015 will be reached 8.9 billion in 2050. In sub-Saharan countries the population will grow from 0.86 billion in 2010 to 1.96 billion in 2050[4,5,6]. Ethiopia is the second most populous country in Africa with a total population of 98.1 million by mid-2015 and projected population of 130.5 million and 165.1 million by mid-2030 and mid-2050 respectively[3,6].

According to Ethiopian demographic and health survey (EDHS), Ethiopia is one of the sub-Saharan African countries where biggest and determined fertility rate has been seen for a long dated of time. Although a slight decreasing trend was shown from year to year, it is still high and the fertility is higher in rural 4.6 compare to urban 1.9[1]. There is a steady decline in total fertility rate (TFR) in Ethiopia from 5.5 children per woman in 2000 to 5.4 children per woman in 2005 to 4.8 children per woman in 2011 and 4.6 children per women in 2016[7]. The demographic implication of Ethiopian population growth on the African region is substantial[2,8]. Its population has increased nearly 1.3 times from 80 million at the beginning of 2005 to about 101 million in 2016. The estimated annual rate of growth was 2.48%[7].

Based on the 2007 census conducted by the Central Statistical Agency (CSA) of Ethiopia, the Southern Nations, Nationalities, and Peoples' Region (SNNPR) of Ethiopia has an estimated total population of 14,929,548 (7,425,918 men and 7,503,630 women)[9]. This region has a total fertility rate of 4.4 children per woman, which is significantly higher than Addis Ababa (1.8) and Dire Dawa (3.1)[7].

To reduce the fertility to the expected level, Ethiopia has been providing family planning services by considering a significant contribution of family planning in reduction of fertility. The Ethiopian population policy also enforced that the minimum age at marriage should be 18 years and emphasized this change as one of the key factors in lowering fertility[4,10,11]. Despite these efforts, uninhibited fertility has been persisting in Ethiopia and adversely influencing the socio-economic, demographic and environmental development of the country [12]. High fertility also increased obstetric and medical risks of mothers[12,13]. Other evidences also showed that high maternal, child and infant mortality and also fetal deaths and low birth weight are also associated with high fertility[2,3]. In developing countries like Ethiopia, pregnancy and child birth is 18 times more likely in the woman's death than in developed countries[1,4,7]. High fertility could be due to a variety of factors. These factors differ from place to place, depending on the particular conditions of the given area[15]. Fore-instance, poverty, low levels of education, early marriage, early child bearing, history of under-five mortality, number of children attach with honor, less utilization of family planning, a feeble infrastructure, and low agricultural and industrial production have aggravated the problem of high fertility[12].

A proper understanding of these factors is of dominant importance in attacking the problem of uncontrolled fertility, which overlays the way for the improvement of the prevailing socio-

economic problems of the country. Particularly, it would have a considerable contribution in the improvement of the wellbeing status of women and children[16]. Experience of fertility transition countries also emphasizes the role of determining factors in fertility change[17].

Identifying factors responsible for fertility levels in the Angacha district would imply identifying factors in other similar settings of the country and important in detecting relevant variables of interest for intervention. Therefore, this study is intended to identify the determinants of high fertility in Angacha District of Southern Ethiopia.

SUBJECTS AND METHODS

μ≤Community based case-control study design was conducted among 388 married women (129 cases and 259 controls) from September 20 to October 10, 2017. The study was conducted in the Angecha district, Kambata Tembero zone, SNNPR, Ethiopia. The study includes those women aged 20 through 49 who has been married for at least 5 years and gave birth to at least one alive child and also live at least in selected kebeles for six months. Among these women the cases were women with number of alive children ever born (CEB) greater or equal to 5 (high fertility). Controls were women with number of alive children ever born (CEB) less than 5 children.

The sample size was calculated using double population proportion by using STATCALC program of the EPI INFO statistical software considering the most determinants of high fertility (age at first marriage, history of under-five mortality and age at first childbirth) from the study conducted in Gilgel Gibe field research center of Jimma University. Age at first marriage of women gave a maximum sample size, so by taking age at first marriage as a main determinant of high fertility [2], at the level of significance (⊡) = 0.05, the power of the test (1-⊡) = 80%, the case to control ratio(r) = 1:2, the

proportion of exposure among controls (P1) = 57%, the proportion of exposure among cases (P2) = 41%. The final sample size calculated was a total of 369 (123 cases and 246 controls) women. Then, by taking 5% non-response rate it became n = 369X5/100 =388 (case=129 and control=259) women.

To identify these sampled women from the district, first, from 22 kebeles of the district, 8 kebeles were selected by lottery method. Then, the sampling frame of cases and controls of married women in the selected 8 kebeles were obtained from family folder registration books and the number was assigned accordingly. Proportional allocation to size method was employed for determining the number of married women to be included in the study from each of the kebele. Then, the study subjects were selected using simple random sampling technique using table of random method from a list of cases and controls. Finally, records were reviewed for the women address and then by tracing their address (by the help of health extension workers, from each kebele) the women were interviewed.

The dependent variable of this stud was status of fertility. Fertility status is measured by a number of children ever born (CEB) alive. It was categorized as low fertility when CEB alive is< 5 and high fertility when CEB alive is ≥5. The cutoff point of 5 is taken because the medical and obstetric risk for mothers with a number of CEB greater or equal to 5 children is significantly higher compared with those with less than 5 children [2]. It is also based on the population policy of Ethiopia which aims to have less than five children per women as low fertility, and greater or equal to five children per women as high fertility [18].

The independent variables were socio-demographic variables: educational level, place of residence, religion, ethnicity and occupation. Reproductive health related variables: age at first marriage, age at first birth, age at last birth,

age at first sexual intercourse, contraceptive use, knowledge about the fertile period between menstrual cycles, duration of breast-feeding, duration of post-partum amenorrhea, history of still birth, abortion experience and experience of under-five mortality.

The data was collected using a structured interviewer administered questionnaire, which was developed and adapted from EDHS and other published literatures. It was initially prepared in English and was translated to local language (Kembatic), and back to English by language experts to ensure consistency. The data was collected by eight health professionals with diploma and supervised by two professionals with Bachelor of Science (BSc) degree.

Data collectors and   supervisors were trained for two days and pretest was conducted in a rural village adjacent to the study area. Based on pretest result modification was done on the questionnaire, repetitive ideas and ambiguous questions were corrected. Each questionnaire was reviewed and checked for completeness by the supervisors and the research team on daily basis and the necessary feedback given to the data collectors.

The completeness and consistency of the data was checked, coded and double entered into EPI-INFO version 3.5.1 and exported to Statistical Package for Social Sciences (SPSS) version 21 for analysis. Exploratory data analysis was carried out to check the levels of missing values and presence of influential outliers. Descriptive statistics were computed and presented using frequencies, proportions, summary statistics and tables. The bi-variable and multivariable logistic regression conducted to identify determinants of high fertility. Variables at p-value of 0.25 in the bivariate logistic regression and biologically plausible variables were included in multivariable logistic regression analysis. Adjusted odds ratios with 95% CI were used for those variables which were found to be determinants of high fertility. Hosmer and Lemeshow test as well as Omnibus test were used to test the model fitness. Variables which were significant at p-value of 0.05 in 95% CI were considered as the determinants of high fertility.

The study was conducted after getting approval from Arba Minch University institutional review board (IRB) to conduct the study. Following the approval, official letter of co-operation was written to concerned bodies by the department of Public Health of Arba Minch University. Permission was granted from the Angacha district administration, where the study conducted, as per the recommendation letter from the department. Informed written consent was obtained from the study participants (mothers) after explaining the purpose of the study. Participants were assured that their name will not be stated, data will be kept confidential and anonymous and it will be used only for research purpose.

RESULT

Of the total of 388 eligible women (129 cases and 259 controls) requested for interview, 126 cases and 255 controls participated making a response rate of 98.2%. The mean number of alive CEB for the women in the case group were 8 ($\pm$2.0SD) and 4 ($\pm$1.0SD) for the control group.

The mean ($\pm$SD) age of the study participants was 34.8 ($\pm$6.12) years. Majority of cases (77%) and controls (81.2%) were protestant. Concerning educational status of women, (79.4%) among cases and (42.7%) controls did not attended formal education. High proportion of women, (84.1%) among cases and (79.6%) among controls resides in rural area. Regarding educational status of their husbands, (47.6%) of cases and (49.4%) controls had husbands that did not attend formal education whereas (52.4%) of cases and (50.6%) of controls had husbands who attended formal education. Regarding occupational status of women, high proportion of women (68.2) among cases and (40.4%) among controls were house wives (Table 1).

Table 1. Socio demographic characteristics of study respondents in Angacha district, Kambata Tembero zone, Southern
       Ethiopia, 2017

Variables	Category	Cases N=126(%)	Controls N=255(%)
Maternal age(Years)	20-24	7(5.6)	8(3.1)
	25-29	28(22.2)	59(23.1)
	30-34	33(26.2)	75(29.4)
	35-39	25(19.8)	55(21.6)
	40-44	18(14.3)	36(14.1)
	45-49	15(11.9)	22(8.6)
Religion	Orthodox	26(20.6)	38(14.9)
	Protestant	97(77)	207(81.2)
	Others**	3(2.4)	10(3.9)
Ethnicity	Kambata	114(90.5)	220(86.3)
	Hadiya	9(7.1)	19(7.4)
	Others***	3(2.4)	16(6.3)
Place of residency	Urban	20(15.9)	52(20.4)
	Rural	106 (84.1)	203(79.6)
Educational status of women	No formal education	100(79.4)	109(42.7)
	Primary	16(12.7)	137(53.7)
	Secondary	8(6.3)	7(2.7)
	≥Secondary	2(1.6)	2(0.8)
Education status husbands	No formal education	60(47.6)	126(49.4)
	Primary	45(35.7)	108(42.4)
	Secondary	12(9.5)	14(5.5)
	≥ Secondary	9(7.1)	7(2.7)
Occupation of women	Housewife	86(68.2)	103(40.4)
	Farmer	20(15.9)	69 (27.1)
	Merchant	20(15.9)	83(32.5)

**Muslim and Catholic   ***Gurage and Siltie

Majority of the respondents, (63.5%) of cases and (42%) of controls were married before 18 years of age. Whereas, women who gave birth of first child before 19 years of age were higher among cases (62.6%) compared to controls (47.8%). The majority of the cases (63.5%) and controls (44.7%) desired more than five children before marriage. About 61.1% of women in the case group and 24.3% of women in control group have had under-five mortality. Regarding history of contraceptives, (48.4%) of cases and (52.9%) of controls were ever heard about contraception and (10.3%) of cases and (49.1%) of controls were ever used contraceptive methods (Table 2).

Table 2. Reproductive health characteristics of cases and

controls among married women living in Angacha district, Kambata
Tembero zone, Southern Ethiopia, 2017

Variables	Category	Cases n=126(%)	Control n=255(%)
Age at first sexual intercourse	<18 years	65(51.6)	127(49.8)
	≥18 years	61(48.4)	128(51.2)
Age at first marriage	<18 years	80(63.5)	107(42)
	≥18 years	46(36.5)	148(58)
Age at first birth	<19 years	79(62.6)	122(47.8)
	≥19 years	47(37.4)	133(52.2)
Age at last birth	20-34 years	49(38.9)	135(52.9)
	35-49 years	77(61.1)	120(47.1)
Desire of more children (before marriage)	<5	46(36.5)	141(55.3)
	≥5	80(63.5)	114(44.7)
Desire of additional children (currently)	Yes	64(50.8)	125(49)
	No	62(49.2)	130(51)
Husband's need additional children(currently)	Yes	67(53.2)	127(49.8)
	No	59(46.8)	128(50.2)
History of abortion	Yes	68(54)	122(47.8)
	No	58(46)	133(52.2)
History of stillbirth	Yes	75(59.5)	101(39.6)
	No	51(40.5)	154(60.4)
History of under-five mortality	Yes	77(61.1)	62(24.3)
	No	49(38.9)	193(75.7)
Ever heard of contraceptive	Yes	61(48.4)	135(52.9)
	No	65(51.6)	120(47.1)
Ever use of contraceptive methods	No	113(89.7)	130(50.9)
	Yes	13(10.3)	125(49.1)
Knowledge about the fertile period between menstrual cycles	Yes	62(49.2)	133(52.2)
	No	64(50.8)	122(47.8)
Duration of postpartum amenorrhea after the last birth	<6 months	42(33.3)	85(33.3)
	≥6 months	41(32.5)	87(34.2)
Ever breast-feed exclusively	Yes	67(53.2)	124(48.6)
	No	59(46.8)	131(51.4)
Duration of breastfeeding during the last birth	0-4months	37(29.4)	85(33.3)
	5-6 months	30(23.9)	39(15.3)

In binary logistic regression analysis, variables like educational status of women (COR[95%CI] = 1.9[0.09-0.23]), occupation of women (COR[95%CI] = 0.29[0.16-0.51]), age at first marriage (COR[95%CI] = 2.41[1.55-3.73]), age at first birth (COR[95%CI] = 1.83[1.18-2.84]), age at last birth (COR[95%CI] = 1.77[1.14-2.73]), desire of more children (before marriage) (COR[95%CI] = 0.46[0.30-0.72]), history of under-five mortality (COR[95%CI] = 4.89[3.09-7.74]), history of still birth (COR[95%CI] = 2.24[1.45-3.46]) and ever use of contraceptive methods (COR[95%CI] = 8.36[4.48-15.6]) were significantly associated with high fertility.

In multivariable logistic regression,

educational status of women was significantly associated with high fertility. In that, women who attended formal education were 64% less likely to have high fertility compared to those who did not attended formal education (AOR [95%CI] = 0.36 [0.16-0.83]). Similarly, desire to have more children before marriage is significantly associated with the high fertility, women who desire to have less than five children before marriage were 49% less likely to have five or more children ever born compared to their counter parts (AOR [95%CI] = 0.51 [0.28-0.93]). Age at marriage is significantly associated with high fertility, women who get married at early age (less than 18 years) were 4.77 times more likely to have 5 or more children as compared to women who get married at 18 years and above (AOR [95% CI] = 4.77[2.59-8.78]). Ever use of contraceptive method is

significantly associated with high fertility, women who had never used contraceptive were 4.55 times more likely to have 5 or more children ever born compared to women who had used contraceptive (AOR [95%CI] = 4.55[2.21- 9.39]). History of under-five mortality is significantly associated with high fertility, women who had history of under-five mortality were 4.22 times more likely to have 5 or more children ever born compared to women who had no history of under-five mortality (AOR [95% CI] = 4.22[2.59- 8.78]). However, factors like occupational status, husband education, age at first birth, age at last birth, history of still birth, and duration of breast feeding for the last birth failed to show significant association with high fertility in multiple logistic regressions analysis (Table 3).

Table 3. Determinants of high fertility among married women in Angacha District, Kambata Tembero zone, Southern Ethiopia, 2017

Variables	High Fertility (%)		COR (95%CI)	AOR (95%CI)	P-value
	Cases n=126	Control n=255			
Educational status of women					
No formal education	100(79.4)	109(42.7)	1	1	0.001
Formal education	26(20.6)	146(57.3)	1.9(0.09-0.23)	0.36(0.16-0.83) **	0.001
Age at first marriage					
<18 years	80(63.5)	107(42)	2.41(1.55-3.73)	4.77(2.59-8.78) **	0.001
≥ 18 years	46(36.5)	148(58)	1	1	
Desire more children					
<5	46(36.5)	141(55.3)	0.46(0.30-0.72)	0.51(0.28-0.93) **	0.027
≥5	80(63.5)	114(44.7)	1	1	
History of <5 child mortality					
Yes	77(61.1)	62(24.3)	4.89(3.093-7.74)	4.22(2.43-7.31) **	0.001
No	49(38.9)	193(75.7)	1	1	
Ever use of contraceptive methods					
No	113(89.7)	130(50.9)	8.36(4.48-15.6)	4.55(2.21-9.39) **	0.001
Yes	13(10.3)	125(49.1)	1	1	

**=statistically significant at p≤0.05

DISCUSSION

In this study, educational status of women, age at marriage, a desire to have children before marriage, ever use of contraceptive and under-five mortality were identified as factors determining the likelihood of having five or more children ever born.Educational status of women has shown to be independently associated with high fertility in this study. Women who attended formal education were 64% less likely to have five or more children compared to those who did not attend formal education. This result is in line with the results of the studies done in Tigray, Northern Ethiopia[8] and Butajira, Southern Ethiopia[19]. This might be due to the fact that women who are able to read and write were probably spend their time in school and consequently have an awareness about their fertile period and less likely to have unwanted pregnancy and birth.

Age at first marriage also was shown to be significantly associated with high fertility, where being 18 years of age or less at marriage 4.7 times increased likelihood of having five or more children. This finding is supported by the studies done in Jimma, Ethiopia[2], Nepal[20], Butajira, Ethiopia[19]. In addition, Ethiopia demographic and health survey shows that women who married at age of 18 years or less were three times more likely to have five or more children[21]. This may be as a result of the fact that marriage indicates women's exposure to the risk of pregnancy and those who married early have on average an extended period of exposure to pregnancy and a greater number of life time births.In this study, the number of children a woman desired to have before marriage is significantly associated with high fertility, where those women who desire less than five children before marriage were 49% less likely to have five or more children compared to those women who desire to have five or more children before marriage. This concurs with the findings of a study in

Hawassa, Ethiopia[22]. Pro-natalist culture prevailing in Ethiopia especially in rural areas were children thought as wealth, source of help in old age and maintain posterity could explain the finding of the study where the highest proportions of women were rural resident.Moreover, having had under-five mortality was shown to increase the likelihood of having five or more children 4.22 times. This finding corroborates the finding of the studies conducted in Hawassa, Southern Ethiopia[22] and Tigray, Northern Ethiopia[8]. It is generally believed that high infant and under-five mortality causes high fertility through the insurance and replacement effect. The insurance effect considers that the couples adjust their fertility because they expect some of their children to die. Child replacement effect involves a deliberate decision of couples to make up for the lost children and is based on the fact their previous childbearing[23]. Women's characteristics regarding ever use of contraceptive have shown to be significantly associated with high fertility, where women who have not used contraceptive methods were 4.55 times more likely to have 5 or more children compared to those women who ever used contraceptive methods. This finding concurred with that of the study conducted in Southern Ethiopia[24]. The possible reason for this consistency might be contraceptive methods could decrease risk of pregnancy and then fertility.

The strength of this study is being a community-based study and use of control study participants.

The limitation of the study is that the study relied on participants' self-reported data, which was prone to social desirability bias due to the retrospective tracking of information beyond the advantages of case control study. But, close monitoring by supervisor and principal investigator was made to minimize such biases, clarification of potential ambiguities and misunderstandings, maintaining privacy of participants and proving for answers were

carried out by interviewers.

CONCLUSION AND
RECOMMENDATION

In general, this study identified important factors that determine high fertility among married women in Angacha district, Southern Ethiopia. Those women who are able to read and write desired less than five children before marriage were less likely to have five or more children. Comparatively, the likelihood of having five or more children has shown to increases with being 18 years of age or less at marriage and ever use of contraceptive as well as having under-five mortality.

In conclusion, educational status of women, age at first marriage, desire to have children before marriage, ever use of contraceptive and experience of under-five mortality were identified as factors determining the likelihood of having five or more children. Therefore, to decrease women's fertility, all concerned bodies should intervene by improving the education level of women, increase age at first marriage of women, reduce child mortality and improving access to contraceptive methods.

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