DETERMINANTS OF PREGNANCY AMONG LATE ADOLESCENTS VISITING PUBLIC HEALTH FACILITIES OF ARBA MINCH TOWN, SOUTHERN ETHIOPIA: A CASE CONTROL STUDY

Hanan Abdulkadir, MPH[1], Meseret Girma, MPH1, Firdawek Getahun, MPH[1]
Sultan Hussen, MPH[1], Nigussie Boti, MPH[1,2], Blicha Oumer MPH[3]

ABSTRACT

BACKGROUND: Adolescence is a critical period in human life with development of the reproductive organs, the onset of menarche, and the beginning of sexual activity. In many SSA countries including Ethiopia, a large amount of adolescent girls become pregnant. Pregnancy and childbirth during adolescence is a leading cause of maternal morbidity and mortality due to its adverse maternal and neonatal outcomes. However, little is known about risk factors for pregnancy among late adolescents. Therefore, the aim of this study was identify determinants of pregnancy among late adolescents who visit public health facilities of Arba Minch, Ethiopia.

METHOD: An institution - based unmatched case control study was conducted from February to April, 2019. Cases were pregnant adolescents (age 15-19 years) who came for delivery, abortion, or antenatal care. Controls were non-pregnant adolescents(age 15-19 years) who visited outpatient department or youth friendly service for other cases ruled out by history and urine human chorionic gonadotropin pregnancy test (HCG). The total sample size was 380 (85 cases and 285 controls) which were randomly selected. Data was collected by using face to face interview and entered to Epi-data version 3.4 then exported to SPSS version-23 for analysis. Binary logistic model was used to identify factors associated with the outcome variable. Variables with p-value <0.25 in bi-variable logistic analysis were selected for multivariable logistic regression model. The level of significance was declared at p-value <0.05.The final model was fitted with Hosmer and Lemesho (p-value<0.5).

RESULT: Finding of this study show that family monthly income less than one thousand Ethiopian birr (AOR=11.11; 95%CI=2.65-46.65), family history of pregnancy before age 19 (AOR=2.85; 95%CI=1.04-7.79), starting first sexual activity without desire (AOR=2.52; 95%CI =1.07-5.93), and poor modern contraceptive methods (AOR=4.84; 95%CI=2.09-11.20) were determinants of adolescent pregnancy in the study area.

CONCLUSION: Family income, family history of adolescent pregnancy, starting first sexual activity without desire, and poor modern contraceptive methods were determinants of adolescent pregnancy. Therefore facilitating income generating activities, strengthening adolescent girl life skill through adequate life skill training, and providing adequate information about family planning for adolescent girls through training and health information dissemination are recommended.

KEY WORDS: Late adolescent pregnancy; Determinants; Arba Minch town public health facilities.

(The Ethiopian Journal of Reproductive Health; 2021; 14; 42-52)

1 School of Public Health, College of Medicine and Health Sciences, Arba Minch University, Arba Minch, Ethiopia
2 School of Public Health, College of Medicine and Health Sciences, Wolaita Sodo University, Wolaita Sodo, Ethiopia
3 Department of Midwifery, College of Health Sciences, Arba Minch, Ethiopia

INTRODUCTION

The World Health Organization (WHO) defined adolescence as all persons aged 10 to 19 years. Older or late adolescents range from – 15 to 19 years [1]. There are 1.2 billion adolescents aged 10-19 around the world that makes up 16% of the world's population [2]. The majority (86%) of adolescents live in developing countries[3]. Adolescent pregnancy is a global phenomenon. Although it has declined substantially over the past two decades, the pregnancy rate among girls and women 15 to 19 years of age remains a stubborn public health problem. It is estimated that about 16 million girls 15–19 years old give birth each year, contributing nearly 11% of all births worldwide [4].

Adolescent pregnancy is also a very common problem in Ethiopia. Teenage childbearing is more common in rural than in urban areas (15 % versus 5%, respectively) and among women in Afar (23%) and Somali regions (19 %) compared with Addis Ababa (3 %) [5]. Findings from a study conducted in Arba Minch show that prevalence of teenage pregnancy among school-age adolescents was 7.7 % [6].

Globally, the leading cause of maternal deaths of girls aged 15 to 19 years was pregnancy and childbirth complications. The majority 99% of deaths were in low and middle-income countries[7]. Pregnancies that occur during adolescent age had negative social and economic consequences especially for unmarried pregnant adolescents who may face stigma or rejection by parents and peers and threats of violence. With regard to education attainment, the majority of girls drop out of school because of early pregnancy or marriage [8,9]. In addition, most of the adolescent mothers face higher risks of unsafe abortions and pregnancy-induced hypertension[10,11]. Evidence also showed that the majority of adolescent pregnancies were at higher risks of low birth weight, preterm delivery, and severe neonatal conditions[10]. A study done in Ethiopia showed that the proportion of children born to teenagers had higher low birth weight, diarrhea, fever, cough and death than those born to adult mothers [12].

Ethiopia has several policies that contribute to improved adolescent health, and prevent teen pregnancies. These include the National Youth Policy, the newly-developed Adolescent and Youth Health Strategy, and the School Health and Nutrition Strategy. Also, through health extension and school health programs, the Ministry of Health aims to improve adolescents' access to contraceptives and family planning. Additionally, child marriage is prohibited by law in Ethiopia but still, adolescent pregnancy is a burning public health and demographic challenge in Ethiopia [13]. Studies on late adolescent pregnancy are very limited in Ethiopia, especially in this study area, and most of them were cross sectional studies. Also, this study solves the limitation of previous researches (ruling out pregnancy and proper measurement of variables). The aim of this study was to identify determinants of pregnancy among late adolescents who visit public health facilities of Arba Minch town. Early adolescents are not included because the magnitude of pregnancy is high in late adolescents.

METHOD

Study design

An institution - based unmatched case control study was conducted to identify determinants of adolescent pregnancy.

Study setting and Population

This study was conducted in Arba Minch public health facilities. Arba Minch is a town and separate woreda in southern Ethiopia, ArbaMinch is located 435 km southwest of Addis Ababa, the capital city of Ethiopia, and 275 km southwest of Hawassa, the capital city of Southern Nations and Nationalities Regional state. According to the latest national population projection based on the population and housing census, the total population of the town was about 103,965 people (14). In the town, there is one public hospital and two health centers. This study was conducted from February 9 to April 9, 2019. The source population for case was all pregnant

late adolescents between 15 to 19 years who came to public health facilities for delivery, abortion, and ANC. For control were all the non-pregnant late adolescents between 15 to 19 years who came to public health facilities to OPD or youth friendly service for other cases.

The study population for the case was systematically selected pregnant late adolescents age between 15 to 19 years who came for delivery, abortion, or ANC (pregnancy confirmed from secondary data). The control group were systematically selected non-pregnant late adolescents age between 15 to 19 years who came to OPD and youth friendly service for other cases (ruled out by history and HCG pregnancy test).

Inclusion criteria

Late adolescent girls age (15-19 years) who visit Arba Minch public health facility at the time of data collection.

Sample size determination

Sample size was calculated by epi-info 7 using the following determinants (from previous research): having history of maternal teenage pregnancy, having self-reported low or average contraceptive knowledge, or sexual abuse during childhood [15, 16,17]. Based on following assumption: taking % of control exposed 2.8%, AOR=3.92 (from study done in Colombia)[17],1:3 ratio, at 95% confidence interval for a two-sided test, 80% power with a minimum detectable alternative of ± 5%. Accordingly, the sample size calculated was 344 (86 cases and 258 controls). Assuming 10 % non-response rate, the final sample size was approximately 380 (approximately 95 cases and 285 controls).

Sampling procedure and technique

First cases were proportionally allocated to one public hospital and two health centers. The case control ratio in each facility, which was 1:3, was maintained during proportional allocations. The cases in each public health facilities were again proportionally allocated to delivery, abortion, and ANC. Controls were also proportionally allocated to OPD and youth friendly service. Finally, study participants were selected by systematic random sampling technique (Figure 1)

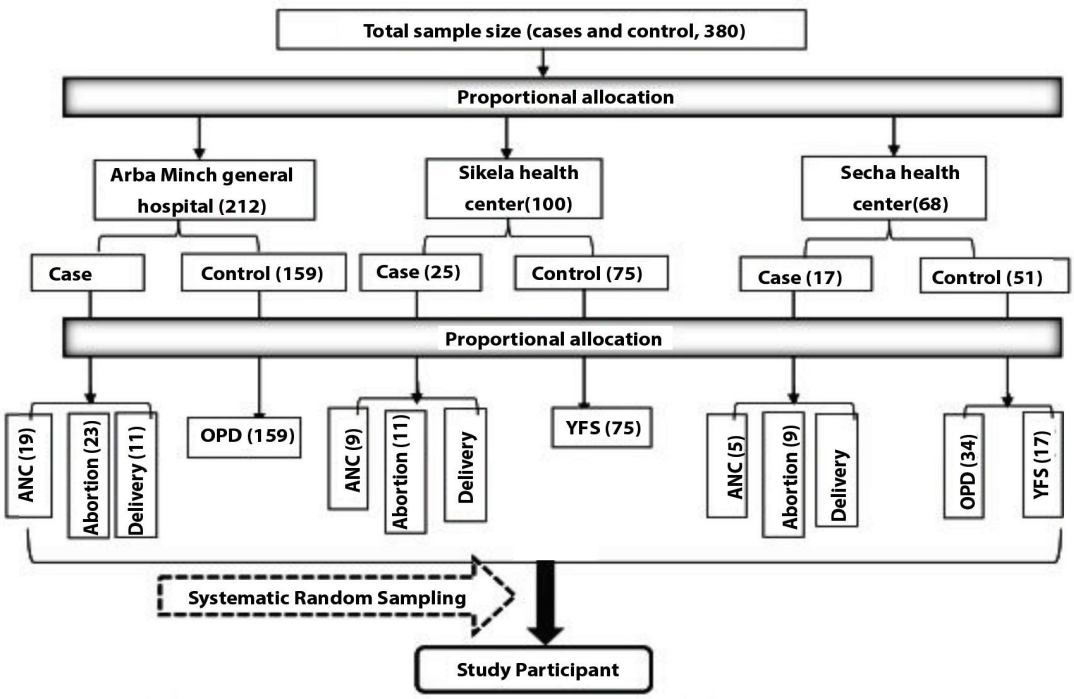

Figure 1: Presentation of sampling procedure on determinants of pregnancy among late adplescents age (15-19 years) who visit public health facilities of Arba Ninch town, Ethiopia 2019

Operational definition

Modern contraceptive knowledge: Respondents were asked 7 questions related to modern contraceptive knowledge and those who scored greater than the mean value were considered as having "good knowledge". Those who scored less than the mean value were considered as having "**poor knowledge**".

Substance use =Use of substances like alcohol/ cigarette/khat /Ganja/heroin/marijuana) [14].

Parent –daughter relationship = was measured by mean score from the four questions; computed (i.e.; 1) and leveled as '1= poor interaction (if scored < 1) and '2= good interaction (if scored ≥1) [14].

Sexual intercourse without desire: Sexual intercourses that happened without willingness which include rape and sex for money.

Data collection tool and technique

Face to face interview was used for data collection by structured close ended Amharic questionnaire. It was collected by 12 nurses and supervised by 3 public health officers who were all staff of the public health facilities. The questionnaire was developed based on different literature, and it was adapted to the data collection place context. The main components of the questionnaire were socio-demographic factors, socio-economic factors, family background, sexual and reproductive history, modern contraceptive knowledge, parent-daughter relationship, and substance use.

Data quality assurance

The questionnaire was translated to Amharic then back to English to check its consistency. Then 5% (20 which is 5 cases and15 controls) questionnaires were pretests for three days in Shele health center. Unclear questions were amended. Training was given to data collectors and supervisors for one day and was focused on objectives, procedures, tools, and ethics of the study. On-spot checking and reviewing the completed questionnaires were done by data collectors. The data was checked by supervisors and investigator for its completeness and consistency. Any incompleteness and error were corrected accordingly.

Data processing and Analysis

First data was checked for its completeness and consistency then it was entered to epi data version 3.4. Analysis was done by SPSS version 23. bivariate and multivariable analysis using logistic regression model with 95% confidence interval was done to assess the association between dependent and independent variables ($p \leq 0.25$) was used for inserting to multivariable analysis and finally the association was computed for ($p \leq 0.05$). Goodness of fit test was checked by using Hosmer and Lemeshow.

Ethical approval

Ethical approval was obtained from the Institutional Research Ethics Review Board (IRB) of Arba Minch University, College of Medicine and Health Science. Before the actual data collection, necessary communications about the overall purpose of the study were made with the town administrative bodies. Verbal assent was taken (for those aged <18) and permission was taken from families or health professionals if families were not available and written consent was taken (for those age 18 and above) after explaining the purpose of the study, the potential harm and benefit, confidentiality, and the rights of subjects. To maintain confidentiality, no personal identifiers were used on data collection forms and the recorded data was not accessed by a third person, except the principal investigators..

RESULT

Socio demographic Characteristics of the study participant

The response rate of the study participants was 100%. More than half 19(66.3%) of cases and 161(56.5%) of controls were aged between 18 and 19 years. A high proportion 285(75%) of study participants lived in urban areas. Thirteen percent 13(13.7%) of cases and 10(3.5%) controls did not receive formal education. More than half 59(62.1%) of cases and 38(13.3%) controls were married. Almost one third 27(28.4%) of cases and

33(11.6%) controls families earn <1,000 Ethiopian birr per month. Ethnicity included under other was Gurage, tigrie, and Ari (Table1).

Table-1: Socio demographic and economic characteristics assessed as determinants of pregnancy among late adolescents who visit public health facilities of Arba Minch Town, Southern Ethiopia.

Variables	Categories	Case N (%)	Control N (%)	Total N (%)
Age	15-17	32(33.7%)	124(43.5%)	156(41.1%)
	18-19	63(66.3%)	161(56.5%)	224(58.9%)
Residence	Urban	69(72.6%)	216(75.8%)	285(75%)
	Rural	26(27.4%)	69(24.2%)	95(25%)
Religion	Muslim	12(12.6%)	22(7.7%)	34(8.9%)
	Protestant	45(47.4%)	133(46.7%)	178(46.8%)
	Orthodox	37(38.9%)	128(44.9%)	165(43.4%)
	Catholic	1(1.1%)	2(0.7%)	3(0.8%)
Ethnicity	Gamo	71(74.7%)	179(62.8%)	250(65.8%)
	Goffa	7(7.4%)	22(7.7%)	29(7.6%)
	Wolitta	6(6.3%)	26(9.1%)	32(8.4%)
	Amhara	5(5.3%)	24(8.4%)	29(7.6%)
	Oromo	4(4.2%)	12(4.2%)	16(4.2%)
	Others*	2(2.1%)	22(7.7%)	24(6.3%)
Educational status of adolescents	No formal education	13(13.7%)	10(3.5%)	23(6.1%)
	Primary (1-8)	35(36.8%)	97(34.0%)	132(34.7%)
	Secondary (9-12)	36(37.9%)	109(38.2%)	145(38.2%)
	College and above	11(11.6%)	69(24.2%)	80(21.1%)
Marital status	Single	36(37.9%)	247(86.7%)	283(74%)
	Married	59(62.1%)	38(13.3%)	97(25.5%)
Average monthly income	<1,000	27(28.4%)	33(11.6%)	60(15.8%)
	1,000-1,500	10(10.5%)	19(6.7%)	29(7.6%)
	1,501-3,000	31(32.6%)	77(27.0%)	108(28.4%)
	3,100-4,500	12(12.6%)	41(14.4%)	53(13.9%)
	>4,500	15(15.8%)	115(40.4%)	130(34.2%)

Family related characteristics of study participant

More than one third 36(37.9%) mothers of adolescents among the cases and 116(40.7%) mothers of adolescents among the controls did not attend formal education. With regard to family size 29(30.5%) of adolescents from cases and 87(30.5%) of controls lived in the family size greater than or equal to seven. Thirty percent 29(30.5%) of adolescents among the cases and 18(6.3%) of the controls had family history of pregnancy before age 19 years (Table 2).

Table-2: Family backgrounds assessed for determinants of pregnancy among late adolescents who visit public health facilities of Arba Minch Town, Southern Ethiopia.

Variables	Categories	Case N (%)	Control N (%)	Total N (%)
Mother's educational status	No formal education	36(37.9%)	116(40.7%)	152(40.0%)
	Primary (1-8)	35(36.8%)	75(26.3%)	110(28.9%)
	Secondary (9-12)	15(15.8%)	57(20.0%)	72(18.9%)
	College and above	9(9.5%)	37(13.0%)	46(12.1%)
Fathers educational status	No formal education	20(21.1%)	74(26.0%)	94(24.4%)
	Primary (1-8)	28(29.5%)	74(26.0%)	102(26.8%)
	Secondary (9-12)	19(20.0%)	44(15.4%)	63(16.6%)
	College and above	28(29.5%)	93(32.6%)	121(31.8%)
Family size	≤3	17(17.9%)	38(13.3%)	55(14.5%)
	4-6	49(51.6%)	160(56.1%)	209(55.0%)
	≥7	29(30.5%)	87(30.5%)	116(30.5%)
Family history of pregnancy before age of 19 year	Yes	29(30.5%)	18(6.3%)	47(12.4%)
	No	66(69.5%)	267(93.7%)	333(87.6%)
Family member who has history of pregnancy before 19 year	Mother	21(72.4%)	3(16.7%)	24(51.1%)
	Sister	8(27.6%)	15(83.3%)	23(48.9%)

Sexual and reproductive history of study participants

Among the study participants 33(34.7%) of cases and 113(39.6%) controls see their menarche when their age is between 9 years and 13 years old. Approximately half 48(50.5%) of sexually active cases and 23(35.4%) controls had first sex at the age between 16 and 17 years old. Almost half 45(47.4%) of the cases and 15(23.1%) controls had their first sex without desire. Approximately half 49(51.6%) of case and 113(39.6%) of controls did not received sexual education. More than half 52(54.7%) of the cases and 96(33.7%) controls had poor modern contraceptive knowledge. More than half 59(62.1%) of cases and 247(86.7%) of the controls had poor daughter parent relationship. Concerning history of substance use 27(28.4%) of cases and 21(7.4%) controls ever used substance use (Table 3).

Table-3: Sexual and reproductive history of study participants among late adolescents who visit public health facilities of Arba Minch Town, Southern Ethiopia.

Variables	Categories	Case N (%)	Control N (%)	Total N (%)
Age of menarche	9-13	33(34.7%)	113(39.6%)	146(38.4%)
	14-19	62(65.3%)	172(60.4%)	234(61.6%)
Age at first sex(158)	8-15	20(21.1%)	15(23.1%)	35(21.9%)
	16-17	48(50.5%)	23(35.4%)	71(44.4%)
	18-19	27(28.4%)	27(41.5%)	54(33.8%)
Reason to have first sex(158)	With desire	50(52.6%)	50(76.9%)	100(62.5%)
	Without desire	45(47.4%)	15(23.1%)	60(37.5%)
Receive Sexual education	Yes	46(48.4%)	172(60.4%)	218(57.4%)
	No	49(51.6%)	113(39.6)	162(42.6%)
Previous history of pregnancy (380)	Yes	11(11.6%)	19(6.7%)	30(7.9%)
	No	84(88.4%)	266(93.3%)	350(92.1%)
Modern Contraceptive knowledge	Good	43(45.3%)	189(66.3%)	232(61.1%)
	Poor	52(54.7%)	96(33.7%)	148(38.9%)
Parent daughter relationship	Good	36(37.9%)	38(13.3%)	74(19.5%)
	Poor	59(62.1%)	247(86.7%)	306(80.5%)
Substance use	Yes	27(28.4%)	21(7.4%)	48(12.6%)
	No	68(71.6%)	264(92.6%)	332(87.4%)

DETERMINANTS OF ADOLESCENT PREGNANCY

In this study age of the participant, educational status of the participant, marital status, family average monthly income, mothers educational status, family history of pregnancy before age 19,age at first sex, starting first sex without desire, sexual education, previous pregnancy, knowledge of modern contraceptives, parent-daughter relationship, and substance use showed association in bivariate and entered to multivariable analysis, then family average monthly income, family history of pregnancy before age 19, starting first sex without desire and knowledge of modern contraceptives had shown association with adolescent pregnancy. The likelihood of being pregnant during late adolescence was 11 times more likely to occur among those adolescents whose family monthly income was less than one thousand Ethiopian birr, compared to those whose family monthly income was greater than 4,500 Ethiopian birr (AOR=11.11; 95%CI=2.65-46.65). Participants with family history of pregnancy before age 19 years were nearly three times more likely to be pregnant than their counterparts (AOR=2.85; 95% CI= 1.04-7.79). Adolescents who had start their first sex without desire were 2.52 times more likely to be pregnant than their counterparts (AOR=2.52; 95% CI=1.07-5.93). Those adolescents who had poor modern contraceptive knowledge were nearly 5 times more likely to be pregnant compared to than those who have good knowledge about modern contraceptive methods (AOR=4.84; 95%CI =2.09-11.20) times more likely to be pregnant than those who have good knowledge (Table 4).

Table -4: Determinants of pregnancy among late adolescents who visit public health facilities of Arba Minch town, Ethiopia 2019.

Variables	Categories	Case N (%)	Control N (%)	AOR (95%CI)	P –value
Average monthly income	<1,000	27(28.4%)	33(11.6%)	11.11(2.65-46.65)	0.001*
	1,000-1,500	10(10.5%)	19(6.7%)	3.137(0.78-12.59)	0.107
	1,501-3,000	31(32.6%)	77(27.0%)	1.59(0.59-4.28)	0.353
	3,100-4,500	12(12.6%)	41(14.4%)	2.17(0.69-6.79)	0.186
	>4,500	15(15.8%)	115(40.4%)	1	
Family history of pregnancy before age of 19years	Yes	29(30.5%)	18(6.3%)	2.85(1.04-7.79)	0.042*
	No	66(69.5%)	267(93.7%)	1	
Reason to have first sex	With desire	50(52.6%)	50(76.9%)	1	
	Without desire	45(47.4%)	15(23.1%)	2.52(1.07-5.93)	0.034*
Contraceptive methods knowledge	Good	43(45.3%)	189(66.3%)	1	
	Poor	52(54.7%)	96(33.7%)	4.84(2.09 - 11.20)	0.0001*
Educational status of adolescents	No formal education	13(13.7%)	10(3.5%)	2.171(0.345- 13.652)	0.409
	Primary (1-8)	35(36.8%)	97(34.0%)	2.956(0.748- 11.681)	0.122
	Secondary (9-12)	36(37.9%)	109(38.2%)	2.854(0.936-8.704)	0.065
	College and above	11(11.6%)	69(24.2%)	1	
Marital status	Single	36(37.9%)	247(86.7%)	1.545(0.593-4.025)	0.373
	Married	59(62.1%)	38(13.3%)	1	
Age	15-17	32(33.7%)	124(43.5%)	1	
	18-19	63(66.3%)	161(56.5%)	0.502(0.192-1.307)	0.158
Age at first sex	8-15	20(21.1%)	15(23.1%)	0.367(0.092-1.462)	0.155
	16-17	48(50.5%)	23(35.4%)	1.213(0.463-3.180)	0.694
	18-19	27(28.4%)	27(41.5%)	1	
Mother's educational status	No formal education	36(37.9%)	116(40.7%)	0.663(0.165-2.673)	0.564
	Primary (1-8)	35(36.8%)	75(26.3%)	2.087(0.531-8.200)	0.292
	Secondary (9-12)	15(15.8%)	57(20.0%)	0.816(0.194-3.431)	0.781
	College and above	9(9.5%)	37(13.0%)	1	
Previous history of pregnancy	Yes	11(11.6%)	19(6.7%)	0.563(0.174 -1.825)	0.338
	No	84(88.4%)	266(93.3%)	1	
Substance use	Yes	27(28.4%)	21(7.4%)	1.361(0.529-3.502)	0.523
	No	68(71.6%)	264(92.6%)	1	
Receive Sexual education	Yes	46(48.4%)	172(60.4%)	1	
	No	49(51.6%)	113(39.6)	0.760(0.266-2.170)	0.608
Parent daughter relationship	Good	36(37.9%)	38(13.3%)	1	
	Poor	59(62.1%)	247(86.7%)	1.012(0.398-2.572)	0.980

* P < 0.05; AOR: adjusted odds ratio; COR: crudes odds ratio; 1.00 reference category, CI confidence interval.

DISCUSSION

This study found that an average household monthly income, family history of adolescent pregnancy, desire to have first sexual intercourse, and contraceptive method knowledge were identified as the determinants of adolescent pregnancy among the adolescent women (15-19 years) who visit public health facilities of Arba Minch town.

The average monthly household income significantly associated with pregnancy during adolescence. Adolescents who have low (<1000 ETB) average monthly household income are more likely to experience pregnancy than adolescents with relatively high (>4,500 ETB) average monthly household income. This study finding is supported by the findings of the studies conducted in Degua, Northern Ethiopia; Orellana, Ecuador; Malaysia; Eastern Nepal and Mersin, Turkey[15,16,18,19, 20]. This might occur because low economic status commonly causes adolescents to marry early, while higher family monthly income might get adolescents to marry later, as they have more likely engaged in education and employment opportunities. Additionally, they may engage in premarital sex for the sake of economic survival.

The study participants who were from a family who had experienced adolescent pregnancy were more likely to be pregnant than study participants from family who had no history of adolescent pregnancy. This result is in line with the findings from the studies done in Mersin, Turkey; Bogota, Colombia and Degua, Northern Ethiopia[15,17,20]. This intergenerational effect might be because families with no history of adolescent pregnancy might perceive the bad consequence of pregnancy during early age. The direct effect of close family sexual and reproductive behaviors might influence their daughter not to get pregnant during adolescence. Additionally, the factors responsible for exposing the family member to adolescent pregnancy might persist in the family/surroundings and expose the adolescent.

In this study, being forced to engage in to first sexual intercourse was identified as determinant factor for pregnancy during adolescence. Being engaged in first sexual intercourse without desire increased the likelihood of having pregnancy during adolescence age more than having first sexual intercourse voluntarily. This finding concurs with findings of the studies in Orellana, Ecuador and Cape-town, South Africa [16, 21]. This may be due to the fact that an individual forced into first sexual intercourse may have less freedom and power to negotiate use of contraceptive methods.

Modern contraceptive knowledge was also identified as determinant of adolescent pregnancy; where adolescent girls who have poor knowledge about contraceptive methods were more likely get pregnant during their adolescence than adolescent girls with good knowledge of modern contraceptives. This finding corroborates the finding of the study conducted in Bogota, Colombia[17]. This might be due to the fact that having limited knowledge hampers adolescent's access to reproductive health services and accurate information about effective modern contraceptive methods.

CONCLUSION

Since family average monthly income (<1,000 Ethiopian birr), family history of pregnancy before age 19, first sexual intercourse without desire, and poor knowledge on contraceptive methods are all determinants of late adolescent pregnancy in the study area, then facilitating income generating activities, strengthening adolescent girl life skill through adequate life skill training and providing adequate information about the family planning for adolescent girls through training, and health information dissemination are recommended. In our study 60% of those who were married, so it better to intervene this early marriage.

COMPETING INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this paper

FUNDING

Arba Minch University supports this research financially. The university has no role in the design of the study, collection, analysis, or interpretation of the data and in writing the manuscript.

AUTHORS' CONTRIBUTIONS

All authors contributed to data analysis, drafting and revising the article, gave final approval of version to be published and agree to be accountable for all aspects of the worker

ACKNOWLEDGMENT:

We would like to acknowledge all study participants for their voluntary participation in this study. We would like to extend our gratitude to Arba Minch University for all the support and opportunity provided for us to conduct this study.

CORRESPONDING AUTHOR:

Bilcha Oumer, MPH
Department of Midwifery, College of Health Sciences, Arba Minch, Ethiopia,
Bedruoumer@gmail.com

REFERENCES

1. WHO. The second decade: improving adolescent health and development. Geneva: WHO; 2001.
2. UNAIDS. Report on the Global AIDS epidemic. Geneva: UNAIDS; 2008.
3. Bearinger L, Sieving RE, Ferguson J, Sharma V. Global perspective on the sexual and reproductive health of adolescents: patterns, prevention, and potential. Lancet. 2007; 369:1220–31.
4. WHO, "Adolescent pregnancy fact sheet," 2014.
5. Ethiopia Demographic and Health Survey 2016. Addis Ababa, Ethiopia and Calverton, Maryland, USA, 2016
6. Samuel M, Aleme M. Teenage Pregnancy and Its Associated Factors among School Adolescents of Arba Minch Town, Southern Ethiopia. Ethiop J Health Sci.2017; 28(3): 287
7. WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. Trends in maternal mortality: 1990 to 2015: Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. Geneva: WHO; 2015.Filippi V, Chou D, Ronsmans C, et al. Levels and Causes of Maternal Mortality and Morbidity. In: Black RE, Laxminarayan R, Temmerman M, et al., editors. Reproductive, Maternal, Newborn, and Child Health: Disease Control Priorities, Third Edition (Volume 2). Washington (DC): The International Bank for Reconstruction and Development / the World Bank; 2016 Apr 5. Chapter 3.
8. World Bank. Economic impacts of child marriage: Global synthesis report. Washington, DC: World Bank; 2017
9. Taffa N, Obare F. Pregnancy and child health outcomes among adolescents in Ethiopia. The Ethiopian Journal of Health Development. 2004;18(2).
10. Ganchimeg T, et al. Pregnancy and childbirth outcomes among adolescent mothers: a World Health Organization multicountry study. Bjog. 2014; 121(S Suppl 1):40-8.
11. Darroch JE, Woog V, Bankole A, Ashford LS. Adding it up: costs and benefits of meeting contraceptive needs of adolescents. New York (NY): Guttmacher Institute; 2016
12. Kozuki N, Lee AC, Silveira MF, Victora CG, Adair L, Humphrey J, Ntozini R, Black RE, Katz J. The associations of birth intervals with small-for-gestational-age, preterm, and neonatal and infant mortality: a meta-analysis. BMC public health. 2013 Sep;13(3):1-9.
13. Fact sheet teenage pregnancy Ethiopia. Roundtable Discussion on Preventing Teenage Pregnancies by Rutgers and the Government of Ethiopia for the High-Level Political Forum .2017
14. Central Statistical Authority of Ethiopia (CSA). Population and housing Census of Ethiopia: statistical Abstract. Addis Ababa; Ethiopia: CSA; 2007. p. 7–8
15. AyeleB G/kidan, Gebregzabher TG, Hailu TT, Assefa BA. Determinants of teenage pregnancy in Degua Tembien District, Tigray, and Northern Ethiopia: A community-based case control study. PLoSONE13 (7):e0200898 .https://doi.org/10.1371/ journal. Pone. 0200898.2018
16. Goicolea I, Wulff M, Öhman A, San Sebastian M. Risk factors for pregnancy among adolescent girls in Ecuador's Amazon basin: a case-control study. Rev Panam Salud Publica. 2009;26(3):224
17. Morón-Duarte LS, Latorre C, Tovar JR. Risk factors for adolescent pregnancy in Bogotá, Colombia, 2010: a case-control study. Rev Panam Salud Publica. 2014;36(3):181
18. Sharma AK, Verma K, Khatri S, Kannan AT. Determinants of pregnancy in adolescents in Nepal. The Indian journal of pediatrics. 2002 Jan;69(1):19-22.
19. Khairani O, Suriati H, Noor Azimah M, Aida J, Syahnaz H, Harlina H. Adolescent pregnancy outcomes and risk factors in Malaysia. International Journal of Gynecology and Obstetrics 111 2010;221
20. Birsen G, Aysun O, Mehmet Z. Determinants of adolescent pregnancy in urban area in turkey. Journal of biosocial science.2007; 39(2)
21. Caesar V, Fidelia M, Rachel J, Esme J. Risk factors for teenage pregnancy among sexually active black adolescents in cape town. S Afr Med I j .2001; 91: 73-80