International Journal of Biomedical Research
ISSN: 0976-9633 (Online); 2455-0566 (Print)
Journal DOI: https://doi.org/10.7439/ijbr
CODEN: IJBRFA

Original Research Article

Determinants of repeated induced abortion in Bahir Dar city, North West, Ethiopia: A case control study

Yalew Wondifraw[1], Yibekal Manaye[2] and Tameru Menberu[3]

[1]*Department of Public Health in Student Clinic, Bahir Dar University, Bahir Dar, Ethiopia*
[2]*Department of Public Health College of Medicine and Health Sciences Dire Dawa University, Dire Dawa Ethiopia*
[3]*Department of Medical Laboratory College of Medicine and Health Sciences Dire Dawa, University, Dire Dawa, Ethiopia*

Abstract

Background: According to the World Health Organization (WHO) estimate, one-third of pregnancies end in miscarriage, stillbirth, or induced abortion in the world. There are various reasons for a woman to seek induced abortion. However, limited information is available so far in the country and particularly in the study area.
Objective: To identify determinants of repeated induced abortion among reproductive age women attending health facility in Bahir Dar city, Amhara Region, North West Ethiopia, 2018.
Methods: A Facility based unmatched case control study was conducted in Bahir Dar October 24, 2017 - March 30, 2018. Total sample size of 106 cases and 212 controls were used. Each study participants were selected using systematic sampling technique. Data were entered into Epi Data 3.1and Analyzed using SPSS version 21 for analysis. Binary and multivariable logistic regression analyses were computed.
The p-value, adjusted odds ratio and its 95% confidence interval were used to show presence and strength of association between different predictor variables and repeated induced abortion.
Results: - All sampled cases and controls were actually interviewed. The mean age of case was 23.3 years (± 3.5) and 22 (±3.1) of control. The age greater than fifteen years of women of first menses seen (AOR=2.58,95% CI :1.4, 4.75), age of before eighteen years the first sexual intercourse (AOR=3.66, 95% CI: 1.85, 7.22), multiple sexual partners in the last twelve months (AOR=3. 84, 95% CI:2.11, 6.97), use emergency contraceptive (AOR=2.31, 95% CI :1.27,4.23), substances use (AOR =2.91, 95% CI:1.42, 5.96) were statistically significant predictors for repeated induced abortion.
Conclusions: In this study, age at first sexual intercourse before eighteen years, multiple sexual partners in the past twelve months, age of at first menses seen after fifteen years, use emergency contraceptives and substance use were statistically significant determinants for repeated abortion.
Keywords: Case control study, Induced Abortion, Ethiopia.

***Correspondence Info:**
Dr. Yibekal Manaye
Department of Public Health College of Medicine and Health Sciences, Dire Dawa University, Dire Dawa, Ethiopia

***Article History:**
Received: 05/07/2021
Revised: 21/10/2021
Accepted: 26/10/2021
DOI: https://doi.org/10.7439/ijbr.v12i11.5641

QR Code

How to cite: Wondifraw Y, Manaye Y and Menberu T. Determinants of repeated induced abortion in Bahir Dar city, North West, Ethiopia: A case control study. *International Journal of Biomedical Research* 2021; 12(11): e5641. DOI: 10.7439/ijbr.v12i11.5641 Available from: https://ssjournals.com/index.php/ijbr/article/view/5641

1. Introduction

Abortion is the major reproductive health problem that affects all women of reproductive age groups, especially young women and adolescent girls. Unplanned pregnancy and births have serious significances to the mother and family and are global social and health burdens. In recent years, the decrease of maternal mortality and morbidity has been a main matter in many international conferences. Although improvements have been reported in mothers' survival, the World Health Organization (WHO) still estimated that many women (287,000 in 2010) continue to die worldwide from various causes related to pregnancy and child birth[1].

Each year, Global an estimated 43.8 million abortion take place.19-20 million unsafe abortion, Developed world 19%(2010-2014) abortion rate and in the developing world 39% (2010-2014) [2].

Based on to the World Health Organization (WHO) approximation, 1/3 of pregnancies end in miscarriages, stillbirth, or induced abortion in the world. Of the estimated 42 million induced abortions each years, nearly 20 million are performed in unsafe conditions and results in the deaths of an estimated 47,000 women[3].

Developing countries account for 99% (286 000) of the global maternal deaths with sub Saharan Africa region alone accounting for 62% (179 000) followed by Southern Asia(69 000).Oceania is the region with the fewest maternal deaths at 510, [4]

Aware of these truths and with the determined to reduce maternal death due to unsafe abortion, the Ethiopian government had revised the abortion law in 2005. The national data in Ethiopia showed that about 32% of pregnancies were unintended and the annual abortion rate was 24 per 1,000 women aged 15-44 years in 2016[5].

Women who had one, two or more previous induced abortions are 1.89, 2.66 and 2.03times more likely, respectively, to have a subsequent pre-term delivery, compared to women who carry term. Prior induced abortion not only increases the risk f premature but also delayed delivery [6].The risk of repeat abortion within the abortion population follows Abell-curve: 7.3% are adolescents, 30.8% are 30–34 years old and 13.0% are above the age of 44 [7] .

According to the 2016 Ethiopia demography health survey (EDHS) surveys, the level of unintended pregnancy in Ethiopia is high and may be increasing. Maternal Mortality ratio (MMR) 412 deaths per 100,000 live births in the year 2016. The desire for smaller families is increasing, which reflects broader social and economic changes in the country: The trend of total fertility rate (TFR) 4.6 in EDHS 2016 .It is estimated that there are 3.5 million pregnancies in Ethiopia every year, of which approximately half million end in either spontaneous or induced abortion[8].

In the developing countries, not only causes of maternal mortality are different to those in developed countries, but also are the factors leading to them. There are numerous contributing factors in developing countries that have elucidated by many studies. As have been collated by Thaddeus and Maine (1990), Delays in the decision to seek care (affected by such factors as distance, cost, quality of care, illness factors, women's status, economic status and education status), and deaths on the way to the hospital) and Delays in the provision of adequate care at the health centre(affected by ill staffed facilities and ill-equipped facilities[9].

The study on Favela México 70, São Vicente, and São Paulo, Brazil were socio demography factors more associated repeat induced abortion[10].

The studies conducted in Ghana strong evidence of a reduction in the odds of induced abortion among married women compared with women who had never married or were divorced[11].

The greatest difficulties of unsafe abortion seen a health facility were hemorrhage and sepsis. Researches on the habit of (MVC) for treating abortion difficulties create shorter lengths of hospital stay (and thus, lower resource costs) and a reduced need for a repeat removal. Very few articles focused exclusively on the cost of treating abortion complications[12].

Study conduct Tanzania and Ethiopia Medical abortion uses medications in place of traditional surgical interventions to induce abortion[13] .

While safe termination of pregnancy is a relatively low risk procedure, repeated terminations have been associated with numerous adverse squeals. avoiding repeated unintended pregnancy and associated repeat abortions is the ultimate goal [14, 15].

A study of medication abortion was highly used different study region Kenya all women were occurred repeated induced abortion [16].

In this study we have been showed different independent variable with dependent variable in the form of diagram.

2. Methods and Materials

2.1 Study area and period

Facility based unmatched case control study conducted from October, 24th, 2017-Match 30th, 2018 in Bahir Darcity, the capital city of Amhara Regional state It is located at about 565kms in the North West of Addis Ababa having a latitude and longitude of 11°36′N 37°23′Ecoordinates and an elevation of 1840 meters above sea level.

There are 2 governmental hospitals, ten health centers and three nongovernmental clinics as well as 34 private health facility different levels from for post abortion services provide health facility in Bahir Dar city. According to the information from Bureau of Revenue, total population of the city as of 2010 EFY is 314,007.

2.2 Study Design and Population

Institutional un matched case control study was conducted among women of age 15-49 year (cases and controls) who were seeking post abortion care at health facility in Bahir Dar. The inclusion criteria were Women of age 15-49 year coming to the health facility for repeated induced abortion services from the start date of the study were recruited for the study as cases. All women of age 15-49 year that coming to the selected health facility for single induced abortion from the start date of the study and who are less or equal to 28th week of gestational age LNMP were recruited as controls. Women who were critically ill during data collection period were excluded from this study for case and control.

2.3 Sample size Determination and Sampling procedure

Sample size was determined using Open-Epi version 7.2.1.0. The result of the sample size calculation for unmatched Case- Control study with the following assumptions: two- sided confidence level (1-alpha) or 95%CI and 80% power of the test with a 1:2 ratio case to control ratio was considered. The sample size was

calculated by considering the proportion of abortion done factor associated was large sample size is 106 for cases and 212 for controls, by adding 10% of none response final sample size become 318.

The health facility selected provides post abortion care services, simple random sampling seven health facilities selected. Those were Feleghiwot referral hospital, Bahir Dar health center, Han health center Adinas General Hospital, Abrak specialized clinic Marie stopes, Bahir dar Branch clinic and Family Guidance Association Ethiopia, Bahir Dar Branch clinic were selected.

For case

Case was selected from reproductive age women had repeated abortion we enrolled all women (conceptively) until the required sample size was filled.

For control

Control was selected among women who had committed abortion once in their life time and selected using systematic sampling technique among selected health facility. Using risk set sampling selection of control at the same time next two women. Each health facilities were given equal of proportion allocation sample size.

2.4 Variables

2.4.1 Dependent Variable

Repeated induced abortion

2.4.2 Independent Variables

Socio-demographic variables: Age, marital status, religion, Educational status, occupational status, religion, residence

Reproductive history of study participants: Age at first sexual intercourse, at age first menses seen, Sexual partners in the past twelve months, parity, desire of children

Abortion-related characteristics of respondents: Reason of abortion, abortion was done, counseling, complication, abortion to disclosure.

Health-related characteristics of respondents; family planning, emergency contraceptive, substance use, gender-based violence's

Data Collection tools and Procedure

Data were collected using structured and pretested questionnaire. The questionnaire was First prepared in English then translated to local language (Amharic) and back to English. The Data were collected using interviewer technique questionnaire. Six nurses participated in data collection and supervised by the principal investigator and one Supervisor.

Data management and analysis

Data were entered into EPI Data 3.1, cleaned and analyzed using statistical package for social sciences software (SPSS) Version 21, Data cleaning was done by running frequencies, cross tabulation and sorting among reported cases or variables. Frequency and mean were obtained for variables.

Before proceeding the multivariable logistic regression, variables which was a p-value of ≤0.2include in the multivariable logistic regression. A multiple variable logistic regression analysis was used to show factors determining outcome variables. Finally, P-value < 0.05 was considered statistically significant for all independent variables at the multivariable logistic regression. To determine the factors most statistically significantly associated with repeated induced abortion, odds ratio at 95% CI was determined using logistic regression analysis.

Data quality control

Questionnaire was prepared in English and translated in to Amharic and back translated to English by different qualified individuals to keep consistency of the data.

Six Nurses' data collectors were selected based on their ability to speak the local language for better communication on abortion.

Training was provided to the selected data collectors and supervisors for one day about the process of data collection.

Pretest was done with 10% of the questionnaires one week before actual data collection on similar community as the study population area that was not included in the study. Checked questioners for completeness and accuracy at the closing of each day, and closer supervision was undertaken during data collection

Ethical Considerations

Ethical clearance was obtained from the Bahir Dar University, College of medicine and the Health sciences Review Board before starting the actual work. Letter of support was obtained from the Amhara public health institute. Both written and verbal permissions were secured to undertake the study from the Bahir Dar city administration Health office and selected health facility. All the study participants were informed about the objective and importance of the study and their written consent would obtain before conducting data collection. They were also informed about their right of not participating in the study at any time Privacy and confidentiality of the information was assured and collected anonymously.

3. Results

3.1 Socio-demographic characteristics

A total of 318 women age 15-49 years have participated in the study. Among 106 (33.3%) were case (repeated induced abortion) and 212 (66.7) control (single induced abortion). The response rate was 100%.

Profile case

The mean (±SD) age of cases was 23.3(±3.5) year. Half of age 20-24 years were 57.5% of case. The religion of cases was orthodox Christian which is 90.6 %. The majority of patients were from urban areas 83.1%. Majority ethnicity was case of Amhara about 81.2%. Their marital status revealed that the largest number 62.3% were single.

The educational status of women had college and university 31.1%. The occupation statuses were 27.4% of day labors and, 26.4%of students.

Profile control

The mean age of control was 22 (±3.1) years. 61.3% age 20-24 years. The religion of control was orthodox Christian 90.6%. The majority of patients were from urban areas 74.5%. Majority ethnicities, about 83% were Amhara. Their marital status revealed that the largest number 68.4% single. The educational status of women had college and university 36.5%. The occupation statuses were 39.6%of day labor and 36.4%of students (see Table 1).

Table (1): Sociodemographic characteristics of the study respondents, 2018. (N=318)

Variable	Option	Frequency		
		Case (%) (n=106)	Control (%) (n=212)	N (%)
Age years	15-19years	13(12.3%)	39(18.4%)	52(16.4%)
	20-24 years	61(57.5%)	130(61.3%)	191(60.0%)
	25-29 years	27(25.5%)	36(17.0%)	63(19.8%)
	30-34years	5(4.7%)	7(3.3%)	12(3.8%)
Marital status	Married	22(20.8%)	14(6.6%)	36(11.3%)
	Single	66(62.3%)	145(68.4%)	211(66.4%)
	Divorced	13(12.3%)	40(18.9%)	53(16.7%)
	Widowed	5(4.7%)	13(16.1%)	18(5.7%)
Religion	Orthodox Christianity	96(90.6%)	192(90.6%)	288(90.6%)
	Muslim	10(9.4%)	20(9.4%)	30(9.4%)
Ethnicity	Amhara	86(81.2%)	176(83.0%)	262(82.4%)
	Agew	8(7.5%)	15(7.1%)	23(7.2%)
	Tigray	9(8.5%)	12(5.1%)	21(6.6%)
	Oromo	3(2.8%)	9(4.2%)	12(3.8%)
Education status	Unable to read and write	5(4.7%)	11(5.2%)	16(5%)
	Able to read and write	27(25.5%)	25(11.8%)	52(16.4%)
	Primary (1-8)	14(13.2%)	37(17.4%)	51(16%)
	Secondary (9-12)	27(25.5%)	61(28.8%)	88(27.7%)
	Tertiary/Tvet/college/university	33(31.1%)	78(36.8%)	111(34.9%)
Occupation status	Employed	5(4.7%)	13(6.1%)	18(5.7%)
	Merchants	21(19.8%)	20(9.4%)	4112.9%)
	Housewife	23(21.7%)	17(8.6%)	40(12.6%)
	Students	28(26.4%)	78(36.4%)	106(33.2%)
	Day labor	29(27.4%)	84(39.6%)	113(35%)
Residence	Urban	88(83%)	158(74.5%)	246(77.4%)
	Rural	18(17%)	54(24.5%)	72(22.6%)

3.2 Reproductive history of the study for case

Forty six percent (46.2%) of case had they're at first age menstruation seen after of 15years. 77.4% had their first sexual intercourse before of 18 years. In terms of multiple sexual partners in the past twelve months 57.5% had two and above partners in the past twelve months in the study.

3.3 Reproductive history of the study for control

62.7% of control had their first menstruation seen after of 15years. 56.1% of had their first sexual intercourse before of 18 years. In terms of multiple sexual partner 25.5% of had two and above partners in the past twelve months in the study (see Table 2).

Table (2): Reproductive history of the study respondents, 2018 (N=318)

Variable	Option	Frequencies		
		Case (%) (n=106)	Control (%) (n=212)	N (%)
Age of first menses seen (in years)	Lessthan15	49(46.2%)	133(62.7%)	182(57.2%)
	15andabovey	57(53.8%)	79(37. 3%)	136(42.8%)
Age of first sexual intercourse (in years)	Lessthan18	82(77.4%)	119(56.1)	201(63.2%)
	18andabove	24(22.6%)	93(43.9%)	117(36.8%)
Ever number of sexual partners	One	25(23. 6%)	78(36.8%)	103(32.4%)
	Two and above	81(76.4%)	134(63.2%)	215(67.6%)
Number of sexual partners in the past 12months	One	45(42.5%)	158(74.5%)	203(63.8%)
	Two and above	61(57.5%)	54(25.5%)	115(36.2%)
Ever been pregnant before	Yes	36(34%)	55(25.4%)	91(28.6%)
	No	70(66%)	157(74.6%)	227(71.4%)
have children	Yes	36(34%)	55(25.4%)	91(28.6%)
	No	70(66%)	157(74.4%)	227(71.4%)
How many children	One	26(72.2%)	27(49%)	53(58.2%)
	Two and above	10(27.8%)	28(51%)	38(41.8%)
Did want to have children for the future?	Yes	46(43.4%)	77(36.3%)	123((38.7%)
	No	60(56.6%)	135(63.7%)	195(61.3%)

3.4 Abortion related characteristics of case

From the interviewed women 42(39.6%) of respondents were replied rape was the main reason of induced abortion. 65.1% of case reported the induced abortion procedure was not painful. Among those 66(62.3%) of respondents who had complication, most of complication was 30(45.5%) of respondents had bleeding.

Among the induced abortion, those 81.1% of case disclosed to another person about terminating the pregnancy. Half of 51.2% of cases disclosed to their friends.

3.5 Abortion related characteristics of Control

From the interviewed women 101 (47.6%) of respondents were replied rape were the main reason of induced abortion. 45.8% of reported the induced abortion procedure was not painful. 44.8% among those of respondents who had complication; Most of complication was 60(63.1%) respondents had bleeding Among the induced abortion, those 68.9% of c disclosed to another person about terminating the pregnancy. Half of 54.8% of l disclosed to their friends (see Table:3).

Table (3): Abortion related characteristics of the study respondents, 2018. (N=318)

Variable	Option	Frequency		
		Case (%) (n=106)	Control (%) (n=212)	N (%)
Reason of abortion	family planning is not effective	22(20.8%)	28(13.2%)	50(15.7%)
	Rape	42(39.6%)	101(47.2%)	143(44.9%)
	unplanned sex	21(19.8%)	51(24.1%)	72(22.7%)
	Incest	10(9.4%)	25(11.8%)	35(11%)
	Health problem	11(10.4%)	7(3.3%)	18(5.7%)
Abortion was done using	medical abortion	89(84.0%)	146(68.9%)	235(73.9%)
	surgical abortion	17(16 %)	66(31.1%)	83(26.1%)
Abortion procedure painful	Yes	37(34.9%)	115(54.2%)	152(47.8%)
	No	69(65.1%)	97(45.8%)	166(52.2%)
Did you get counseling about family planning	Yes	97(91.5%)	201(94.8%)	298(93.7%)
	No	9(8.5%)	11(5.2%)	20(6.3%)
Did you face complication while you were pregnant	Yes	66(62.3%)	95(44.8%)	161(50.6%)
	No	40(37.7%)	117(55.2)	157(49.4%)
Type of complication	Bleeding	30(45.5%)	60(63.1%)	90(55.9%)
	Reproductive injury	19(28.8%)	7(7.4%)	26(16.1%)
	infection	17(25.7%)	28(29.5%)	45(28.0%)
Did you face psychological problems	Yes	48(45.3%)	130(61.3%)	178(56.0%)
	No	58(54.7%)	82(38.7%)	140(44.0%)
Did you disclosure to any one	Yes	86(81.1%)	146(68.9%	272(73.0%)
	No	20(18.9%)	66(31.1%)	86(27.0%)
To whom did you disclosure	Partner	20(23.2%)	18(12.3%)	38 (13.9%)
	Family	22(25.6%)	48(32.9%)	70(25.76%)
	Friend	44(51.2%)	80(54.8%)	124(45.5%)

3.6 Health services and behavioral characteristic of the study respondents for case

From the interview women 86.8% of had used family planning. Inject able and Implanon the most ever used contraceptives with 36.9%and 34.8% of respectively.

Emergency contraceptives were used by 67.9%. Among induced abortion 85.8 %of were plan to use family planning for the future.

From the interview women 39.6%of had used substances used. Commonly used substances used induced abortion was alcohol 57.2% of induced abortion. Those women who had ever gender-based violence's occurred 67.0%. Commonly used 47.9% of the most sexual violence's reported.

3.7 Health services and behavioral characteristics of the study respondents for control

From the interview women 94.8% of had used family planning. Emergency contraceptives were ever used by 44.9%. The interview women 13.7%of had used substances used. Those women who had ever gender-based violence's occurred 67.0%. Commonly used47.9% of the most sexual violence's reported (see Table 4).

Table (4): Health related characteristics of the study respondents, 2018 (N=318)

Variable	Option	Frequency		
		Case (%) (n=106)	Control (%) (n=212)	N (%)
Have you use family planning?	Yes	92(86.8%)	201(94.8%)	293(92.1%)
	No	14(13.2%)	11(5.2%)	25(7.9%)
Type of family planning	Inject able	34(36.9%)	84(41.8%)	118(40.3%)
	Pill	25(27.2%)	23(11.4%)	48(16.4%)
	Implanon	32(34.8 %%)	91(45.3%)	123(42.0%)
	IUCD	1(1.1%)	3(1.5%)	4(1.3%)
Have use emergency contraceptive (EC)?	Yes	72(67.9%)	95(44.8%)	167(52.5%)
	No	34(32.1%)	117(55.2%)	151(47.5%)
Time of used emergency contraceptive (EC)	within one day	6(8.4%)	12(12.6%)	18(10.8%)
	After one day	38(52.8)	56(58.9%)	94(56.3%)
	After two day	24(33.3%)	18(18.9%)	42(25.1%)
	After three day	4(5.5%)	9(9.5%)	13(7.8%)
have plan to use family planning for the future	Yes	91(85.8%)	202(95.3%)	293(92.1%)
	No	15(14.2%)	10(4.7%0	25(7.9%)
Did you know the fertility is return after menstruation	Yes	59(55.7%)	149(70.3%)	208(65.4%)
	No	47(44.3%)	63(29.7%)	110(34.6%)
Have you ever substances used	Yes	42(39.6%)	29(13.7%)	71(22.3%)
	No	64(60.4%)	183(86.3%)	247(77.7%)
Which of used substances used?	Cigarettes	5(11.9%)	7(24.1%)	12(16.9%)
	Khat	13(30.9%)	14(48.3%)	27(38.0%)
	Alcohol	24(57.2%)	8(27.6%)	32(45.1%)
Have you ever gender-based violence's	Yes	71(67.0%)	117(55.2%)	188(59.1%)
	No	35(33.0%)	95(44.8%)	130(40.9%)
Which done gender-based violence's?	physical violence	10(14.1%)	25(21.4%)	35(18.6%)
	psychological violence	27(38.0%)	34(29.0%)	61(32.5%)
	sexual violence	34(47.9%)	58(49.6%)	92(48.9%).

3.8 Determinants of repeated induced abortion

Accordingly, variables such as at age of first menstruation seen, age at of first sexual intercourse, sexual partner in the past twelve months, perceive that abortion procedure was painful, use of family planning, use emergency contraceptives, plan to use family planning, substances use and gender-based violence's were considered to fit into the multivariable logistic regression analysis model.

Finally, in order to control confounding, multivariable analysis was used. Then variables such as at age of first menstruation seen, at age of first sexual intercourse, sexual partner in the past 12months, have using emergency contraceptives and substances use were found to be statistically significant determinants of repeated induced abortion.

Therefore, by adjusting for other variables the study showed the odds of repeated induced abortion was 2.5 times (AOR=2.58, 95% CI 1.4 - 4.75) higher with women age of first menstruation seen greater than 15 years than before age 15 years.

The odds of repeated induced abortion were 3.6 times higher with women who started their first sexual intercourse before 18 years than after 18 years their first sexual intercourse (AOR=3.66, 95% CI: 1.85- 7.22).

They showed that repeated induced abortion was 3.8 times (AOR=3.84, 95% CI: 2.11-6.97) higher among women who had multiple sexual partners in the last past 12months compared to those who had one sexual partner.

The odds repeated induced abortion was 2.3 times higher exposed women who have use emergency contraceptive compare to have not use emergency contraceptive (AOR=2.31, 95% CI :1.27-4.23).

Besides, the odds of repeated induced abortion were 2.9 times (AOR=2.91, 95% CI: 1.42- 5.96) higher women who had used substances compared to those who had not used substances.(see Table 5)

Table: -5. Bivariable and Multivariable logistic regression analyses of determinants repeated induced abortion, North west, 2018 (N=318)

Variables	Induced Abortion		OR (95%CI)		P value
	Case	Control	COR (95%CI)	AOR (95%CI)	
Age of the first menstruation seen					
<15years	49	133	1	1	0.002*
≥15years	57	79	1.96 (1.22,3.14)	2.58 (1.4,4.75)	
Age of at first sexual intercourse					
<18years	82	119	2.67(1,57,4.54)	3.66 (1.85,7.22)	<0.001**
≥18 years	24	93	1	1	
sexual partners in the past 12months					
One	45	158	1	1	
Two and above	61	54	3.97(2.42,6.5)	3.83(2.11,6.97)	<0.001*
Perceived that abortion procedure was painful					
Yes	37	115	1	1	0.496
No	69	97	2.21(1.36,3.58)	1.28(0.63,2.6)	
Know when to return fertility after menstruation					
No	47	63	1.88(1.16,3.06)	1.32(0.71,2.45)	0.375
Yes	59	149	1	1	
Have you use family planning?					
Yes	92	202	1	1	0.343
No	14	11	2.78(1.22,6.35)	2.11(0.45,9.8)	
Have use emergency contraceptive (EC)					
Yes	72	95	2.61(1.59.4.26)	2.31(1.26,4.23)	0.006*
No	34	117	1	1	
Had plan to use family planning For the future					
Yes	91	202	1	1	0.107
No	15	10	3.33(1.44,7.69)	3.43(0.77,15.33)	
substances use					
Yes	42	29	2.61(1.59,4.26)	2.91(1.42,5.96)	0.003*
No	64	183	1	1	
gender based violence's					
Yes	71	117	1.65(1.01,2.68)	1.52(0.82,2.79)	0.183
No	35	95	1	1	

4. Discussion

Adjusting for other variables, study participants at age of first menstruation seen after fifteen years, at age of first sexual intercourse before eighteen years, multiple sexual intercourse in the past twelve months, used emergency contraceptive and used substances were independent predictors of repeated induced abortion.

This study has showed the at age of women the first menstruation seen to be associated with determinants of repeated induced abortion service where those women with age of first menstruation had seen greater than 15 years 2.58 times higher for repeated induced abortion than counterparts (AOR=2.58, 95% CI 1.4 -4.75). This finding was found to be different to Kenya [17], Those studies reported before at age first menstruation seen after fifteen years. This might be indicated the after 15 years as youth sexual activity and first pregnancy occurred and other reproductive organ prepared ovulation, physical and Sexual maturation

The finding in this showed Initiated sexual intercourse before age of 18 years than after age of 18 years was 3.6 times higher to have repeated induced abortion than after18 years(AOR=3.66, 95% CI: 1.85- 7.22). These findings was found to be similar study done in Kaduna Nigeria women are first exposed to sexual intercourse to abortions, and other reproductive health problems [18]. In contrast with this finding a research done Ouagadougou Brankfaso, among the predisposing constructs .it was expected that age at first sexual intercourse to have association with repeated induced abortion[19], This finding was supported by research done in Tigray Region eight of ten women initiated sexual intercourse before eighteen years [20].This might be due to lack of awareness on contraceptives and considering not being pregnant and this age was sexual active and the period of an adolescent.

This study was also showed that the multiple sexual partners in the past twelve months of reproductive age women associated with repeated induced abortion. They showed that repeated induced abortion was 3.8 times (AOR=3.84, 95% CI: 2.11- 6.97) higher among women who had multiple sexual partners in the last past 12months compared to those who had one sexual partner the studies supported by a study done in Cambodia women were the increased chance of Condom failure, corresponding to the increased number of multiples sexual intercourse. the number of sexual intercourse partners resulted repeated induced abortion[21].

The studies also supported by a study done in Ghana women were highly multiple boyfriends lead they seek sex and pleasure [22] and In Tigray 46.6% of women who have had at least one abortion have had two and more

sexual partners [20] . It might be due to having coerced sex and condom slippage.

The odds repeated induced abortion was 2.3 times (AOR=2.31, 95% CI:1.27-4.23). higher exposed women who have use emergency contraceptive compare to have not use emergency contraceptive The finding was found to be similar to a study done in India use of emergency contraceptive not correct time and usage poor as result repeated induced abortion. [23] .This finding is supported by a research done in South Africa women lack awareness about when to use emergency contraceptive [24]. The finding in line with Hawassa women undergoing repeated induced abortion emergency contraceptive use not timely[25]. The study also supported by a study done in Dire Dawa the reason could be lack information on the properly [26]. Lastly this finding was almost similar with findings of Addis Ababa[27]. It might be showed women emergency contraceptives failure, the nature used emergency contraceptive preparation, the times used gap and the gap properly used emergency contraceptive.

In our study showed the odds of repeated induced abortion was 2.9 times (AOR=2.91, 95% CI: 1.4 -5.96) higher women who had used substances compared to those who had not used substances. This finding was supported by a research done in Nigeria women were used substances strongly associated with decreased behavior resulted unprotected sex and hence prone to repeated induced abortion [28], This finding agrees with the finding in Wachamo[29]. Another study support this finding a study done in Waliyitasodo[30]. They exposed to drink alcohol, chewing chat, smoking cigarette and others substances used. This might be exposed them for being involved in risky unprotected causal sexual intercourse and unplanned pregnancy which ends up with repeated induced abortion.

5. Conclusion

The study identifies the determinants of repeated induced abortion in Bahir Dar city. From the study findings at age first sexual intercourse before eighteen years, multiple sexual partners in the past twelve months, at age women menstruation seen after fifteen years, use emergency contraceptive and use substances were statistically significant determinants of repeated induced abortion.

6. Recommendation

Health education on dual protection, consistence and correct use of condoms in addition to other modern contraceptives. Create awareness on the impact of substance use and emergency contraceptives and its effectiveness and also educate youths on safer sexual practice.

Encourages women to delay sexual debut and decrease their number of sexual partners, including by promoting discussion within families about sexuality, to decrease the occurrence of repeated induced abortion.

Conducting further researches with qualitative designs on women to understand better the key identify determinants of repeated induced abortion to help plan more specific interventions aimed at reducing abortion-related health risks and improving maternal health.

7. Limitation of the study

Some of the exposure variables require remembering past history there could possibly be a recall bias.

Declarations

Ethical approval and consent to participate

Procedures followed were following the ethical standards of the Ethical Review Board of Bahir Dar University. Following the approval, an Official letter of co-operation was written to Amhara Public Health Institute. From those participants who are agreed to be included in the study verbal consent was taken.

Availability of data and material

The data supporting this finding can be available at any time with a request.

Competing interests

The authors declare that they have no competing interests.

Funding

This is from a developing country; our salary couldn't cover the fee for publication. This paper is original and has a great impact on to design prevention strategy for policymaker and it will be used as the baseline data for future researchers. Therefore, we request your journal to publish this paper free.

Authors, contribution

YW conceived the idea of the study, prepared the study proposal, collected data in the field performed the data analysis, and drafted the manuscript. YM assisted with the preparation of the proposal and the interpretation of data, participated in data analysis, and critically reviewed the manuscript. a TM participated in the critical comments of the proposal and manuscript preparation. All authors read and approved the final manuscript

Acknowledgments

We would like to express our heartfelt gratitude to Bahir Dar University for giving this chance to do this research. Our appreciation also goes to Amhara Health Bureau for their generous provision of information.

References

[1]. Dick B FB. Health for the world's adolescents: a second chance in the second decade. *Journal of Adolescent Health*. 3-6. 2015; 56(1).

[2]. Sedgh G, Bearak J, Singh S, Bankole A, Popinchalk A, Ganatra B, et al. Abortion incidence between 1990 and 2014: global, regional, and subregional levels and trends. *The Lancet.* 2016; 388(10041): 258-67.

[3]. Oyeyemi SO, Wynn R. Giving cell phones to pregnant women and improving services may increase primary health facility utilization: a case–control study of a Nigerian project. *Reproductive health*. 2014;11(1):8.

[4]. WHO U, Mathers C. Global strategy for women's, children's and adolescents' health (2016-2030). Organization. 2017; 2016(9).

[5]. Moore AM, Gebrehiwot Y, Fetters T, Wado YD, Bankole A, Singh S, et al. The estimated incidence of induced abortion in Ethiopia, 2014: Changes in the provision of services since 2008. *International Perspectives on Sexual and Reproductive Health.* 2016;42(3):111-20.

[6]. Bhattacharya S, Lowit A, Bhattacharya S, Raja EA, Lee AJ, Mahmood T, et al. Reproductive outcomes following induced abortion: a national register-based cohort study in Scotland. *BMJ open*. 2012;2(4):e000911.

[7]. Leeners B, Bieli S, Huang D, Tschudin S. Why prevention of repeat abortion is so challenging: psychosocial characteristics of women at risk. *The European Journal of Contraception & Reproductive Health Care.* 2017; 22(1):38-44.

[8]. ICF CSACEa. Ethiopia Demographic and Health Survey 2016: Key

[9]. Indicators Report. Addis Ababa, Ethiopia, and Rockville, Maryland, USA. CSA and ICF. 2016.

[10]. Waddington A, Hahn PM, Reid R. Determinants of late presentation for induced abortion care. *Journal of Obstetrics and Gynaecology Canada.* 2015;37(1):40-5.

[11]. Santos TF, Fusco C, e Silva RdS. Induced and unsafe abortion 20 years after the International Conference on Population and Development, Cairo, 94: prevalence and sociodemographic characteristics. Favela México 70, São Vicente, São Paulo, Brazil. Reprodução & Climatério. 2016;31(1):5-12.

[12]. Klutsey EE, Ankomah A. Factors associated with induced abortion at selected hospitals in the Volta Region, Ghana. *International journal of women's health.* 2014;6:809.

[13]. Luvai NU, Kipmerewo M, Onyango KO. Utilization of youth friendly reproductive health services among the youth bureti sub county in Kenya.

[14]. Baggaley RF, Burgin J, Campbell OM. The potential of medical abortion to reduce maternal mortality in Africa: what benefits for Tanzania and Ethiopia? *PloS one.* 2010;5(10):e13260.

[15]. Gebreselassie H, Fetters T, Singh S, Abdella A, Gebrehiwot Y, Tesfaye S, et al. Caring for women with abortion complications in Ethiopia: national estimates and future implications. *International perspectives on sexual and reproductive health.* 2010:6-15.

[16]. Mulatu MS, Converse P, Kaba M, Mariam DH, Mekonnen W, Kloos H. Bibliography on HIV/AIDS in Ethiopia and Ethiopians in the Diaspora: The 2013 Update. *Ethiopian Journal of Health Development*. 2014;28(1):45-72.

[17]. Kabiru CW, Ushie BA, Mutua MM, Izugbara CO. Previous induced abortion among young women seeking abortion-related care in Kenya: a cross-sectional analysis. *BMC pregnancy and childbirth*. 2016;16(1):104.

[18]. Maina BW, Mutua MM, Sidze EM. Factors associated with repeat induced abortion in Kenya. *BMC public health*. 2015;15(1):1048.

[19]. Oyefabi AO, Nmadu AG, Yusuf MS. Prevalence, perceptions, consequences, and determinants of induced abortion among students of the Kaduna State University, Northwestern Nigeria. *Journal of Medicine in the Tropics*. 2016;18(2):86.

[20]. Ilboudo PG, Somda SM, Sundby J. Key determinants of induced abortion in women seeking postabortion care in hospital facilities in Ouagadougou, Burkina Faso. *International journal of women's health*. 2014;6:565.

[21]. Alemayehu M, Yebyo H, Medhanyie AA, Bayray A, Fantahun M, Goba GK. Determinants of repeated abortion among women of reproductive age attending health facilities in Northern Ethiopia: a case–control study. *BMC public health*. 2017;17(1):188.

[22]. Yi S, Tuot S, Chhoun P, Pal K, Tith K, Brody C. Factors associated with induced abortion among female entertainment workers: a cross-sectional study in Cambodia. *BMJ open*. 2015;5(7):e007947.

[23]. Rondini S, Krugu JK. Knowledge, attitude and practices study on reproductive health among secondary school students in Bolgatanga, upper east region, Ghana. *African journal of reproductive health*. 2009;13(4):51-66.

[24]. Kathpalia S. Emergency contraception: Knowledge and practice among women and the spouses seeking termination of pregnancy. *Medical Journal Armed Forces India.* 2016;72(2):116-9.

[25]. Hoque ME, Ghuman S. Knowledge, practices, and attitudes of emergency contraception among female

university students in KwaZulu-Natal, South Africa. *PloS one.* 2012;7(9):e46346.

[26]. Lamaro T, Mekonen H, Tekelab T. The Contraceptive Knowledge, Practices and Reasons for Failure among Abortion Care Seekers in Hawassa City, Ethiopia.

[27]. Abate M, Assefa N, Alemayehu T. Knowledge, Attitude, Practice, and Determinants Emergency Contraceptive Use among Women Seeking Abortion Services in Dire Dawa, Ethiopia. *PloS one.* 2014;9(10):e110008.

[28]. Prata N, Holston M, Fraser A, Melkamu Y. Contraceptive use among women seeking repeat abortion in Addis Ababa, Ethiopia. *African Journal Of Reproductive Health*. 2013;17(4).

[29]. Imaledo JA, Peter-Kio OB, Asuquo EO. Pattern of risky sexual behavior and associated factors among undergraduate students of the University of Port Harcourt, Rivers State, Nigeria. *Pan African Medical Journal*. 2012;12(1).

[30]. Mitik S, Demissie PM, Meskele FBM. Prevalence of Induced Abortion and Associated Factors among Wachamo University Regular Female Students, Southern Ethiopia. *Journal of Pharmacy and Alternative Medicine.* 2015.

[31]. Gelaye AA, Taye KN, Mekonen T. Magnitude and risk factors of abortion among regular female students in Wolaita Sodo University, Ethiopia. *BMC women's Health.* 2014;14(1):50.