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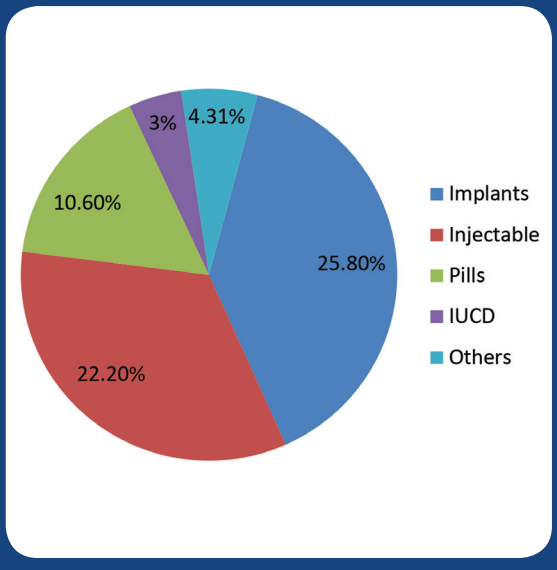

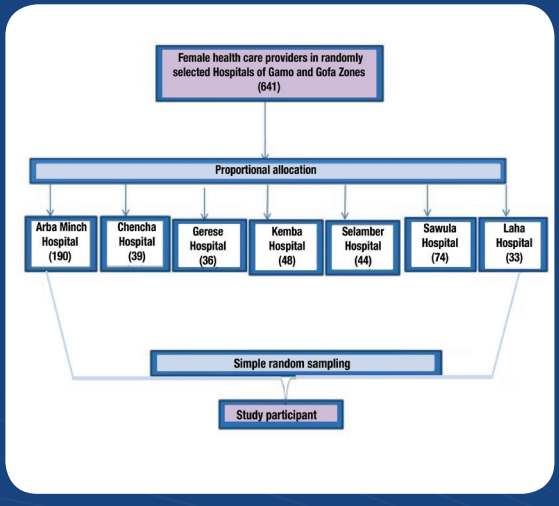

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DETERMINANTS OF FIRST TRIMESTER SPONTANEOUS ABORTION AMONG PREGNANT WOMEN WHO VISIT YAOUNDÉ HOSPITALS: CASE CONTROL STUDY

Fouelifack Ymele Florent, Pascaline Bambo Hetcheu, Mosman Ofeh Anyimbi, Pascal Foumane [1]

ABSTRACT

INTRODUCTION: Abortion is the termination of pregnancy before the period of fetal viability which is 22 weeks according to the WHO. It can be spontaneous or induced. Spontaneous abortion is one of the most common complications of pregnancy and represent 10 to 20% of pregnancy terminations. The objective of this study was to determine the factors associated with first trimester spontaneous abortion.

METHODS: A case-control study was conducted at the Yaoundé Gyneco-Obstetrics and Pediatrics Hospital and the Yaoundé Central Hospital, concerning women received from December 15, 2017 to June 01, 2018. The cases were women whose pregnancy ended in a miscarriage in the first trimester. The controls were pregnant women beyond 14 weeks of pregnancy. Data were analyzed using Epi Info 3.5.4 software. The search for associations between different variables studied was done by the odds ratio with its 95% confidence interval. P was significant for any value <0.05.

RESULTS: The absence of daily walking (aOR=4.83; CI=1.3417.38; aP=0.0159), having a spouse employed in the private sector (aOR=2.90; CI = 1.51 - 5.58; aP=0.001) , not having had a prenatal check-up (aOR=72.02; CI=7.86 - 659.61; aP<0.001), the occurrence of malaria (aOR=63.11; CI=4.18 - 952.02; aP=0.003), and history of spontaneous abortion in the 1st trimester (aOR=65.01; CI=5.93-711.54; aP=0.001) were independent risk factors of first trimester spontaneous abortion.

CONCLUSION: The absence of daily walk, having a spouse employed in private sector, history of abortion, the absence of prenatal check-up and malaria increased the risk of spontaneous abortion in the first trimester. Screening for these factors and intensifying campaigns for Provider Behavior Change Communication would improve the prognosis of pregnancies.

KEYWORDS: Associated factors, spontaneous abortion, first trimester pregnancy, Yaoundé

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INTRODUCTION

According to the World Health Organization (WHO), abortion is defined as the spontaneous or induced termination of pregnancy, with or without complete expulsion of the product of conception before the period of fetal viability; either less than 22 weeks of pregnancy and/or expulsion of a fetus weighing less than 500g [1]. According to the mechanism of occurrence it can be spontaneous or induced [3]. A spontaneous abortion is a natural termination of pregnancy, before the term of 22 weeks or a fetus weighing less than 500g [2]. Spontaneous abortion is one of the most common complications of pregnancy [4].

Spontaneous abortions represent 10 to 20% of pregnancy terminations. The figures are uncertain, because some women do not realize that they have had an abortion and others do not consult the doctor: abortions of this type usually take place in the first ten weeks after fertilization [1]. First trimester spontaneous abortion affects 25% of women [5]. The rate of spontaneous abortion increases with age, 10% at age 20 and more than 90% beyond 45 years [6]. In France, 12 to 24% of pregnancies or 200,000 women are affected each year [7]. At the Ilorin Teaching Hospital in Nigeria, the prevalence was 4.2% in 2007 [8]. In Cameroon, the results of the Demographic Health Survey (DHS) of 2011 reveals that among women who have already had sexual intercourse, 18% reported having had a spontaneous abortion [9].

Several risk factors have been reported in previous studies including advanced maternal and or paternal age, level of education, social level, previous spontaneous abortion, sedentary lifestyle and strenuous physical activity, tobacco and alcohol consumption, infections and chronic diseases such as diabetes. [10, 11]. As regards complications, 3 main complications of spontaneous abortions have been identified [8]: anemia 12.4%, anemia associated with hypovolaemic shock at 0.3%, and infectious complications at 2.6%. Mortality from early spontaneous abortions was estimated at 0.05-0.22/100,000 [12]. Given this high proportion of maternal complications in our context, its psychological effects and high contribution to maternal mortality, this study aimed and acting from a preventive point, that is first identifying the risk factors of first trimester spontaneous abortions to prevent them.

METHOD

Study setting, design and source population

A case-control study was carried out over 7 months, i.e. from 15 November 2017 to June 15, 2018, in two public hospitals: the Gyneco-Obstetrics and Pediatrics Hospital of Yaounde (HGOPY) and the Central Hospital of Yaoundé (HCY). These two health facilities located in the metropolis of Yaounde, capital of Cameroon. They are reference hospitals whose gynecology and obstetric units each carry out about 350 deliveries per month and also receive several referrals, which allowed us easily reach our sample size. Women who came to the hospital for consultation or who were being referred to the gynecology/obstetrics unit constituted the source population

Sampling technique and procedure

The study population consisted of women admitted to the Gynecology and Obstetrics units of HGOPY and HCY. Sampling was consecutive. From clinical calculation with last menstrual period, women who had described a spontaneous abortion in the first trimester and any woman seen with a pregnancy beyond 14 weeks were included. Not included were any women who had an induced abortion, and/or a spontaneous abortion beyond the 1st trimester. The minimum sample size was calculated using the Schlesselman formula [13]: $n = [(1+r)/r] \times [P(1-P)(Z\alpha 2 + Z\beta^2) / (P1 - P2)^2]$ with n= minimum case size, r = control/case ratio (1 case for 2 controls in our study) = 2/1, p_1 = proportion of main factor in group I, p^2 = proportion of the main factor in the group II, $p = (p_1+p_2)/2$ = average of the proportions, $p1-p^2$ = the difference between the proportions, $Z\alpha 2$ = standardized significance level = 1.96, $Z\beta$ = standardized power = 0.84. In considering the

frequency at 50% for the proportion of the main factor in group I and 25% for the proportion of the main factor in group II. p1 = 50% , p 2 = 25% . After numerical application, n = 44.1 or 45 cases for 90 controls. To increase the reliability of our results we recruited all the cases that met our selection criteria, i.e. 79 cases and 138 witnesses.

Data collection procedure

After obtaining ethical clearance and research authorizations from the health facilities' authorities, recruitment was done daily in the 2 gyneco and obstetrics units concerned. Data collection was done by the principal investigator aided by medical students. We also used medical records of patients and registers to complete our information. After explanation of study objectives, verbal or written consent was obtained. For each case (spontaneous abortion in 1st trimester) recruited, we recruited 2 controls (pregnant woman over 14 weeks) that followed. The questionnaire was anonymous, the data was confidential and reserved only for this study. The client was free to withdraw her consent at any time without influencing the rest of her care. Both groups were compared for each variable studied ; sociodemographic, clinical and reproductive variables.

Data processing and analysis

The data collected were entered using Microsoft Excel 2010 software and analyzed using Epi info 3.5.4 software. The tools used to express our results were the number, the frequency, the crude odds ratio (OR) and/or adjusted odds ratio(aOR) with its confidence interval at 95% and P-value. P was significant for any value strictly less than 0.05. Multivariate logistic regression was done to eliminate confounding factors in order to bring out the factors independently associated with 1st trimester abortions.

Operational definitions and data quality assurance

A spontaneous abortion in the 1st trimester was defined in this study as any abortion occurring before 13 complete weeks of amenorrhea which was not induced in any way by the patient herself or any other person.

Induced abortion being illegal in Cameroon, it is possible patients hide the information that they may have induced the abortion. In that case there was no means of ascertaining it. Nevertheless, all patients received in these gynecology and obstetric units are interviewed in private and all possible information is gotten, thus reducing this error.

Ethical approval

Before carrying out our study, we had obtained ethics clearance No. 641 of January 16, 2018 from HGOPY Institutional Ethics and Human Health Research Committee, and No. 1455 CEI-Udo/06/2018/T of June 07, 2018 from the Institutional Ethics Committee of the research for human health from the University of Douala, and the authorizations of hospital administration. The informed consent of each participant was required and requested, to avoid violation of their autonomy. The objectives and possible benefits of the study were explained to the participants and their verbal or written consents required prior to enrolment. The questionnaire was anonymous, the data confidential and reserved only for science. The participant was free to withdraw her consent at any time without this influencing the rest of her care.

RESULTS

A total of 208 participants were recruited and analysed; 69 cases and 138 controls. Slightly greater than one thirds of the women were aged between 25 and 30 years old. The majority were catholic Christians. Seventy one percent in the case group had a secondary school education while 47.8% in the control group had a university education. Generally, most of the women were housewives (43.5% case and 29.7% controls). Similarly, the majority were married or in cohabitation. Only 4.3% of cases and 16.7% of controls did prolonged walking daily. The different associations between the variables studied and spontaneous abortion of the 1st trimester were sought in the following tables.

Sociodemographic factors

Sociodemographic factors associated with first trimester spontaneous abortion are shown

in Table 1. Lack of daily walking was the only independent risk factor for abortion Spontaneous 1st trimester: aOR=4.83; CI=1.34-17.38; P=0.0159.

Sociodemographic factors of spouse related to first trimester spontaneous abortion

Sociodemographic factors associated with first trimester spontaneous abortion, related to spouse are represented in Table 2. Having a spouse employed in the private sector independently increased the risk spontaneous abortion of the 1st trimester: aOR=2.90; CI = 1.51 - 5.58; aP=0.001.

Clinical factors.

Clinical factors associated with first trimester spontaneous abortion are shown in table 3. Not having had a prenatal check-up, and the occurrence of malaria increased significantly independently the risk of spontaneous first trimester abortions, with aOR=72.02; CI=7.86 - 659.61; pa<0.001 and aOR=63.11; CI=4.18 - 952.02; Pa=0.003 respectively.

Obstetric factors

Obstetrical factors associated with first trimester abortion are listed in table 4. History of spontaneous abortion in 1st trimester was an independent risk factor of 1st trimester spontaneous abortion: aOR=65.01; CI=5.93-711.54; P=0.001.

DISCUSSION

The profession of the spouse, particularly in the private sector, was associated with spontaneous abortions in first trimester (OR=1.9; CI=1.06-3.43; P=0.02) and after multivariate analysis it was still an independent risk factor of spontaneous abortion of the 1st trimester, with aOR =2.90; CI = 1.51 - 5.58; aP=0.001 (table 2). These results could be justified by the poor working conditions of the partner and the inherent insecurity of the sector which would lead to a stress factor for the partner because of her concern.

Maternal age and first trimester spontaneous abortion were not associated in this study contradicting the results of the study conducted by Maconochie et al in 2007 in England, which found that maternal age was associated with an increased prevalence first trimester spontaneous abortion [10]. This difference may be explained by the higher proportion women aged more than 30 in the later study.

Lack of daily walking was an independentm risk factor for spontaneous abortion of the 1st trimester, with aOR=4.83; CI=1.34-17.38; aP=0.01 59 (table 1). To an extent, this outcome corroborates that of Wong et al in 2010 who found that physical activity protected (sedentary lifestyle increased risk) his participants from first trimester abortions [13]. This could be as a result of comorbidities accentuated by sedentary lifestyle which have adverse effects on pregnancy.

Table 1. Age, religion, level of education, profession, marital status, physical activity, means of movement and consumption of herbal potions associated with first trimester spontaneous abortion

Variable	Case	Control	P	OR (CI 95%)	aP	aOR (CI 95%)
	N=69 (%)	N=138 (%)				
Age (years)						
[15-25]	18 (26.1)	37 (26.8)	0.530	0.96 (0.49-1.85)		
[25-30]	25 (36.2)	46 (33.3)	0.400	1.14 (0.61-2.08)		
[30-35]	14 (20.3)	40 (29)	0.120	0.62 (0.3-1.24)		
[40-50]	3 (4.3)	1 (0.7)	0.110	6.23 (0.65-165.02)		
Religion						
Catholic	47 (68.1)	77 (55.8)	0.060	1.69 (0.92-3.14)		
Protestant	18 (26.1)	45 (32.6)	0.210	0.73 (0.38-1.39)		
Muslim	4 (5.8)	13 (9.4)	0.270	0.59 (0.16-1.82)		
others	0 (0)	3 (2.2)	0.290	0 (0-3.43)		
Level of education						
None	2 (2.9)	2 (1.4)	0.410	2.03 (0.21-19.78)		
Primary	2 (2.9)	10 (7.2)	0.170	0.38 (0.06-1.63)		
Secondary	49 (71)	60 (43.5)	0.000	3.19 (1.71-5.98)	0.084	1.73 (0.92 - 3.24)
university	16 (23.2)	66 (47.8)	0.000	0.33 (0.17-0.63)		
Profession						
Public sector enployee	8 (11.6)	22 (15.9)	0.270	0.69 (0.28-1.62)		
Private sector	14 (20.3)	36 (26.1)	0.230	0.72 (0.35-1.44)		
Farmer	2 (2.9)	1 (0.7)	0.260	4.09 (0.3-121.42)		
Trader	7 (10.1)	8 (5.8)	0.190	1.83 (0.61-5.43)		
student	8 (11.6)	30 (21.7)	0.050	0.47 (0.19-1.07)		
housewife	30 (43.5)	41 (29.7)	0.040	1.82 (0.99-3.32)		
Marital status						
Single	13 (18.8)	29 (21)	0.430	0.87 (0.41-1.8)		
Married	32 (46.4)	56 (40.6)	0.260	1.27 (0.7-2.27)		
widow	1 (1.4)	0 (0)	0.330	-		
Cohabitation	23 (33.3)	53 (38.4)	0.290	0.8 (0.43-1.47)		
Prolonged daily walking						
Yes	3 (4.3)	23 (16.7)	0.010	0.23 (0.05-0.72)		
No	66 (95.7)	115 (83.3)	0.010	4.4 (1.38-18.94)	0.015	4.83 (1.34 - 17.36)
Movement by bike						
Yes	66 (95.7)	115 (83.3)	0.010	4.4 (1.38-18.94)	0.065	3.36 (0.92 - 12.26)
No	3 (4.3)	23 (16.7)	0.010	0.23 (0.05-0.72)		
Daily physical activity						
mild	15 (21.7)	48 (34.8)	0.040	0.52 (0.26-1.01)		
Moderate	51 (73.9)	82 (59.4)	0.030	1.94 (1.03-3.71)	0.243	1.50 (0.75 - 2.98)
Intense	3 (4.3)	8 (5.8)	0.470	0.74 (0.15-2.8)		
Taking herbal potions						
Yes	13 (18,8)	29 (21)	0,430	0,87 (0,41-1,8)		
No	56 (81,2)	109 (79)	0,430	1,15 (0,56-2,44)		

Table 2: Partners age and profession associated with first trimester spontaneous abortion.

Variable	Case	Control	P	OR (CI 95%)	aP	aOR (CI 95%)
	N=69 (%)	N=138 (%)				
Age of partner						
[15-25[	4 (5.8)	3 (2.2)	0.170			
[25-30[	11 (15.9)	21 (15.2)	0.520			
[30-35[	26 (37.7)	42 (30.4)	0.190			
[35-40[	19 (27.5)	45 (32.6)	0.280			
[40-45[	7 (10.1)	21 (15.2)	0.220			
[45-50[	2 (2.9)	3 (2.2)	0.540			
[50-55[	0 (0)	1 (0.7)	0.670			
[55-65[	0 (0)	2 (1.4)	0.440			
Profession of partner						
Public sector	18 (26.1)	41 (29.7)	0.350			
Private sector	39 (56.5)	56 (40.6)	0.020	1.9 (1.06-3.43)	0.001	2.90 (1.51 - 5.58)
Farmer	0 (0)	2 (1.4)	0.440			
Trader	10 (14.5)	27 (19.6)	0.240			
Student	1 (1.4)	10 (7.2)	0.070			
Unemployed	1 (1.4)	2 (1.4)	0.710			

In this study, not having had a prenatal check-up was an independent risk factor for 1st trimester spontaneous abortion, with aOR=72.02; CI=7.86 - 659.61; aP<0.001 (Table 3). In the study by Touré et al in 2010 in Mali, 77.8% of women who had an abortion had not had a prenatal check-up [14]. This can be explained by the fact that during prenatal checkups screening and and treatment of diseases which can potentially cause abortions a done, malaria in pregnancy is an example of such.

Table 3: Desire for pregnancy, Prenatal checkup, Infections in pregnancy, hypertension, history of first trimester metrorrhagia, sickle cell disease, trauma and alcohol consumption associated with first trimester spontaneous abortion

Variable	Case	Control	P	OR (CI 95%)	aP	aOR (CI 95%)
	N=69 (%)	N=138 (%)				
Desire for pregnancy						
Yes	62 (89.9)	121 (87.7)	0.420	1.24 (0.5-3.37)		
No	7 (10.1)	17 (12.3)	0.420	0.80 (0.3-2.01)		
1st trimester metrorrhagia						
Yes	14 (20.3)	16 (11.6)	0.070	1.94 (0,87-4.28)		
No	55 (79.7)	122 (88.4)	0.070	0,52 (0.23-1115)		
Prenatal checkup done in 1st trimester						
Yes	12 (17.4)	135 (97.8)	0.000	0 (0-0.02)	0.000	72.02 (7.86 - 659.61)
No	57 (82.6)	3 (2.2)	0.000	213.75(60.25-915.65)		
Malaria in pregnancy						
Yes	19(27.5)	4 (2.9)	0.000	12.73 (4.3-44.93)	0.003	63.11 (4.18 - 952.02)
No	50(72.5)	134(97.1)	0.000	0.08 (0.02-0.23)		
Urinary tract infection						
Yes	2 (2.9)	2 (1.4)	0.410	2.03 (0.21-19.78)		
No	67(97.1)	136(98.6)	0.410	0.49 (0.05-4.84)		
Bacterial vaginosis						
Yes	2 (2.9)	3 (2.2)	0.540	1.34 (0.16-9.22)		
No	67(97.1)	135(97.8)	0.540	0.74 (0.11-6.4)		
Hypertension						
Yes	1 (1.4)	1 (0.7)	0.560	2.01 (0.05-79.1)		
No	68 (98.6)	137 (99.3)	0.33	0.50 (0.03-8.05)		
Sickle cell disease						
Yes	2 (2.9)	0 (0)	0.110	-		
No	67 (97.1)	138 (100)	0.060	-		
Blood Rhesus						
Rhesus +	69	135	0.147	-		
Rhesus -	0 (0)	3 (2.2)	0.290	0 (0-3.43)		
v**Alcohol consumption**						
Yes	1 (1.4)	4 (2.9)	0.460	0.49 (0.02-4.02)		
No	68 (98.6)	134 (97.1)	0.460	2.03 (0.25-50.92)		
Recent trauma						
Yes	1 (1.4)	0 (0)	0.330	-		
No	68 (98.6)	138 (100)	0.330	-		

Seemingly, the occurrence of malaria was an independent risk factor for 1st trimester spontaneous abortion, with aOR=63.11; CI=4.18 - 952.02; aP=0.003. These results were like those of Keita et al in 2008 who found 26.9% of cases of occurrence of malaria predominantly in all pregnant women [15]. The predominance of malaria in the first trimester of pregnancy could be the reason because the population is in an endemic area and that the control measures such as sleeping under an impregnated mosquito net are sometimes not respected.

History of first trimester spontaneous abortion was an independent risk factor of 1st trimester spontaneous abortion, with aOR=65.01; CI=5.93-711.54; aP=0.001 (Table 4). Maconochie et al also found that the risk increased with each additional abortion [12]. Results corroborate those of Brigham and al in 1999 in England, who had found 24% of women had a history of 2 consecutive spontaneous abortions and 76% with a history of at least 3 consecutive abortions [16]. These results were significantly superior to those of Blohm et al in Sweden in 2008, who found 4% of women who had 2 spontaneous abortions of the first trimester [17]. This rate would probably be underestimated, since many spontaneous abortions occur before the diagnosis of pregnancy, and sometimes before the amenorrhea is not noticed which is an entity that can be included in failures of implantation. Results would explain that women with a history of spontaneous abortion in first trimester, were at risk of having another abortion reason being that these abortions may be caused by chronic maternal conditions.No associations emerged between first trimester spontaneous abortion and the other variables.

Table 4: Gravidity, parity, history of spontaneous or induced abortion, preterm birth, uterine fibroid, ovarian cyst, sexual partners, chlamydia, and HIVassociated with first trimester abortion

Variable	Case	Control	P	OR (CI 95%)	aP	aOR (CI 95%)
	N=69 (%)	N=138 (%)				
Gravidity						
1	16 (23.2)	32 (23.2)	0.570	1 (0.49-1.98)		
2	14 (20.3)	22 (15.9)	0.280	1.34 (0.62-2.82)		
3	14 (20.3)	33 (23.9)	0.340	0.81 (0.39-1.63)		
4	10 (14.5)	25 (18.1)	0.330	0.77 (0.33-1.68)		
≥5	15 (21.7)	26 (18.8)	0.370	1.2 (0.57-2.44)		
Parity						
0	22 (31.9)	40 (29)	0.390	1.15 (0.61-2.14)		
1	16 (23.2)	38 (27.5)	0.310	0.79 (0.4-1.55)		
2	15 (21.7)	31 (22.5)	0.530	0.96 (0.47-1.92)		
3	5 (7.2)	19 (13.8)	0.120	0.49 (0.16-1.33)		
4	8 (11.6)	9 (6.5)	0.160	1.88 (0.66-5.22)		
≥5	3 (4.3)	1 (0.7)	0.110	6.23(0.65-165.02)		
History of spontaneous abortion in 1st trimester						
Yes	66 (95.7)	31 (22.5)	0.000	75.94(24.05-315.19)	0.001	65.01 (5.93 – 711.54)
No	3 (4.3)	107 (77.5)	0.000	0.01 (0-0.04)		
History of spontaneous abortion in 2nd trimester						
Yes	7 (10.1)	11 (8)	0.390	1.3 (0.46-3.54)		
No	62 (89.9)	127 (92)	0.390	0.77 (0.28-2.2)		
History of voluntary termination of pregnancy						
Yes	7 (10.1)	15 (10.9)	0.540	0.93 (0.34-2.37)		
No	62 (89.9)	123 (89.1)	0.540	1.08 (0.42-2.97)		
Previous preterm birth						
Yes	66 (95.7)	128 (92.8)	0.320	1.72 (0.48-7.97)		
No	3 (4.3)	10 (7.2)	0.320	0.58 (0.13-2.09)		
History of twin pregnancy						
Yes	68 (98.6)	134 (97.1)	0.460	2.03 (0.25-50.92)		
No	1 (1.4)	4 (2.9)	0.460	0.49 (0.02-4.02)		
Current number of sexual partners						
1	69 (100)	137 (99,3)	0,670	-		
2	0	1	0,670	0 (0-38)		
Cumulative number of sexual partners						
1	20 (29)	26 (18.8)	0.070	1.76 (0.89-3.45)		
2	12 (17.4)	37 (26.8)	0.090	0.57 (0.27-1.18)		
>2	37 (53.6)	75 (54.3)	0.461	0.97 (0.54-1.73)		
Uterine fibroid						
Yes	11 (15.9)	9 (6.5)	0.030	2.72 (1.05-7.12)		
No	58 (84.1)	129 (93.5)	0.030	0.37 (0.14-0.95)		
Ovarian cyst						
Oui	1 (1,4)	3 (8,7)	0,390	0,66 (0,07-6,48)		
Non	68 (98.6)	135 (91.3)	0.390	1.51 (0.16-40.34)		
Chlamydiae						
Yes	9 (13)	11 (8)	0.180	1.73 (0.66-4.46)		
No	60 (87)	127 (92)	0.180	0.58 (0.22-1.52)		
Human immunodeficiency Virus						
Yes	0 (0)	5 (3.6)	0.130	0 (0-1.63)		
No	69 (100)	133 (96.4)	0.13	-		

CONCLUSION

The independent risk factors for first trimester miscarriages were: The absence of daily walking, having a spouse employed in the private sector, not having a prenatal check-up, the occurrence of malaria and a history of spontaneous abortion in the 1st trimester. Screening for these risk factors, early start of prenatal consultations and the intensification of campaigns for behavioral change would make it possible to improve the prognosis of pregnancies by reducing the rate of abortions in this study context.

DECLARATIONS:

Limits

Study being of the case-control type, makes it possible to strongly suspect a strong link between the variables without, however, establishing a causal relationship. Not only was the type of abortion not fully considered, but there could also be a recall bias. However, we think that the methodology used made it possible to minimize these biases and increase the reliability of our results.

Conflicts of interest

The authors declare no conflict of interest.

Author contributions

Fouelifack Ymele and Bambo Hetcheu designed the study, recruited, analyzed the data and wrote the manuscript. Mosman wrote the manuscript in English. Foumane designed the study and supervised the process until manuscript submission.

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DETERMINANTS OF PELVIC ORGAN PROLAPSE AMONG WOMEN VISITING ARBA MINCH, SAWLA, AND JINKA GENERAL HOSPITALS, SOUTHERN ETHIOPIA

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ABSTRACT

BACKGROUND: Pelvic organ prolapse is one of the most common gynecological health problems; it can severely limit a woman's psychological, social, physical, and sexual function. The factors causing pelvic organ prolapse have been poorly understood. Therefore this study aimed to investigate the determinants of pelvic organ prolapse among women visiting Arba Minch, Sawla, and Jinka General Hospitals, Southern Ethiopia.

METHOD: Institution-based case-control study was conducted from July 10 to August 31, 2020, in Arba Minch, Sawla, and Jinka General Hospitals. A total of 348 participants were included in the study. Cases and controls were identified by a health professional using the pelvic organ prolapse symptom score (POP-SS). Data was collected by using a pre-tested interviewer-administered questionnaire. Bivariate logistic regression was done to identify variables candidates for Multivariable logistic regression at p-value <0.25. Multivariable logistic regression analysis was done and p-value <0.05 and 95%CI of AOR were used to declare the level of significance.

RESULT: Age of the mother at first delivery (AOR=4, 95% CI: 1.48-11.53), carrying heavy object (AOR=2.8, 95% CI: 1.9-7.62), place of previous delivery (AOR=3.6, 95% CI: 1.37-9.47), mode of previous delivery (AOR=3, 95% CI: 1.73-8.44), family history of pelvic organ prolapse. (AOR=4, 95% CI: 1.63-11.2), body mass index (AOR=4, 95% CI: 1.82-12.9) and household food insecurity (AOR=3, 95% CI: 1.51-7.75) were identified as the determinants of pelvic organ prolapse.

CONCLUSION: In this study age of the mother at first delivery, carrying a heavy object, place of previous delivery, mode of previous delivery, body mass index, family history of pelvic organ prolapse, and household food insecurity were factors found to be significantly associated with pelvic organ prolapse. Therefore, to prevent pelvic organ prolapse health care providers should counsel mothers for maintaining a normal weight, having skilled delivery, and avoiding early pregnancy.

KEYWORDS: Pelvic organ prolapse, determinants, case-control, southern Ethiopia.

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INTRODUCTION

Pelvic organ prolapse is the descent of one or more of the pelvic organs towards and down through the vaginal opening [1]. It is one of the pelvic floor disorders caused by the loss of pelvic floor muscle strength. When the pelvic muscle and tissue loss their ability to support the pelvic organ, the organ will press against or drop into and outside the vagina [2]. Generally, about 34 million women are affected by pelvic organ prolapse worldwide, it is also a very common gynecological health problem with multifactorial etiology, and about 50% of women over the age of 45 years suffer from pelvic organ prolapse [3]. High occurrence of pelvic organ prolapse has also been reported among women of reproductive age in Sub-Saharan Africa [4]. Previous studies done in Ethiopia showed that the prevalence of pelvic organ prolapse ranges from 13.3%-20.5% [5,6].

Pelvic organ prolapse has a giant influence on the basic day-to-day activities of women, disturbing and reducing their quality of life. It can also severely limit a women psychological, social, physical, and sexual function [7]. Studies showed that the social consequences of pelvic organ prolapse include discrimination, functional impair¬ment, depression, poor quality of life, and a significant economic burden on the affected women [8–10]. Research findings showed that high parity, birth-induced injury to connective tissue, age >40 years, delivered at home or delivery assisted by non-health professional, early marriage, early childbirth, occupation like being a farmer, carrying heavy objects, obesity, family history of POP, level of education, and other co-morbidity like constipation chronic and chest disease are a significant risk factor for pelvis organ prolapse [5,11–16].

Even if the problem is prominent, the risk factor associated with POP has been poorly understood [17]. Also, there is a scarcity of research in Ethiopia on this topic, especially in the study area. This study also considers variables like household food insecurity that have not been addressed by other studies. Thus, this study would give important input to health professionals, decision-makers, and program implementers at zonal as well as regional levels to design evidence-based interventions for different programs that are effective for preventing and creating awareness in the community on risk factors of POP. Therefore, this study aimed to investigate the determinant of pelvic organ prolapse among women visiting Arba Minch, Sawla, and Jinka General Hospital, Southern Ethiopia.

METHOD

Study design

An institution-based case-control study design was conducted to identify determinants of pelvic organ prolapse.

Study setting and Population

A study was conducted at Arba Minch, Sawla, and Jinka General Hospitals, Southern Ethiopia from July 10 to August 31, 2020. Arba Minch General Hospital is located in Gamo zone Arba Minch town. Arba Minch town is the administrative center of the Gamo zone and it is located 505 km from Addis Ababa the capital city of Ethiopia. Sawla Hospital is located in the Gofa zone Sawla town, Sawla town is the administrative center of the Gofa zone and it is located 535 km from Addis Ababa. And Jinka General Hospital is located in the South Omo zone Jinka town, the administrative center of the south Omo zone is Jinka town, which is located 745km from Addis Ababa. All three hospitals provide different clinical services including referral cases from different districts and give public health programs such as family planning, antenatal care, delivery service, diagnostic service, treatment of complicated cases, and major and minor surgeries. The source population for cases and controls were all women who visited the gynecologic clinic of Arba Minch, Sawla, and Jinka General Hospitals. Cases were women identified as having a POP, whereas controls were women identified as not having POP by health care professionals using the Pelvic Organ Prolapse symptom score (POP-SS).

Inclusion criteria

All women who visited gynecologic clinics of Arba Minch, Sawla, and, Jinka General Hospitals during the data collection period were included.

Exclusion criteria

Women who were severely ill were excluded.

Sample size determination

The sample size was calculated by using epi-info 7 software with consideration of the proportion of BMI among control exposed = 6.2% and AOR of 3.1 [12], and with the assumptions of the confidence level of 95%, power of 80%, and with the case to control ratio of 1:2. After additional consideration of 5% non-response rate, the total sample size was 348 (cases 116 and controls 232).

Sampling procedure and technique

The three hospitals (Arba Minch, Sawla, and Jinka General Hospitals) were selected because they were the only hospital in Gamo, Gofa, and South Omo zones that provide pelvic organ prolapse reconstructive surgery. Last year, 2011 EFY, 4th quarter 2-month report data was used to estimate the number of cases from each hospital. Then, based on that report, i.e. a total of 162 women with POP received care from the three hospitals; Proportional allocations of respondents to the three hospitals were done. All consecutive case in each hospital during the data collection period was included in the study, and two controls were also included consecutively for each case.

Operational definition

Pelvic organ prolapse: Was identified by the Pelvic Organ Prolapse Symptom Score (POP-SS) which consists of seven items that focus on symptoms caused by pelvic organ prolapse. Each item has a "Yes" and "No" answer with a total score ranging from 0 to 28. Women with a score of 10 and above were taken as cases whereas women with a below score of 10 were taken as controls [18].

Household food insecurity: Was determined using a standardized set of questions derived from the Food Insecurity Experience Scale (FIES) measurement guide. This guide consists of eight questions that were used to measure the degree of food insecurity in the household in the last 12 months. It classifies respondents as "food secure" (those women who replied No for each question) and "food insecure" (those women who replied Yes at least for one question) [19].

Prolonged labor: Labor lasts for approximately 20 hours or more if the mother is the first mother, and 14 hours or more if the mother has previously given birth [20].

Body Mass Index: - Is a women's weight in kilogram divided by the square of height in meters. If BMI is less than 18.5kg/m^2 it falls within the underweight range, If BMI is 18.5kg/m^2 to <25kg/m^2 it falls within the normal range, If BMI ≥25 kg/m^2 to <30kg/m^2 it falls within the overweight range and BMI ≥30 kg/m^2 it falls within the obese range [21].

Heavy work: Women engaged in farming, wood collection, fetching water, and carry¬ing more than 22 kg [22].

Data collection tool and technique

The data was collected through a face-to-face interview using an interviewer-administered semi-structured questionnaire that was developed through reviewing different works of literature [12,13,16,18,19,23]. The questionnaire has five parts. These were socio-demographic, Obstetric and Gynecologic Characteristics, Medical Related Factors, Household Food Insecurity, and pelvic organ prolapse symptom score (POP-SS). POP-SS was validated in Ethiopia in Amharic language with high internal consistency (Cronbach's alpha = 0.86) and test-retest reliability (ICC = 0.81; p < 0.001) [18]. The Food Insecurity Experience Scale (FIES) measurement guide was developed by the FAO [19]. And also the height of the women was measured using a height board while in a standing position and each height was taken to the nearest 0.01m. The weight of the women was measured by using a weight scale to the nearest 1 gram. Then data were collected by six Female Midwife nurses working in maternal and child care and supervised by 3 senior Midwives. Proper orientation was given to each participant on the purpose and usefulness of the study.

Data quality assurance

To assure the data quality, a data collection tool was prepared after an intensive review of relevant works of literature and similar studies. Properly designed data collection instruments were provided after translation into Amharic language and appropriate training for data collectors and supervisors was given. The training included a briefing on the general objectives of the study and clarity on each item in the instrument. Pre-testing was performed at Ottona General Hospital on 5% of the sample size. Every day the collected data was reviewed and checked for completeness by the supervisor and weekly by the Principal Investigator.

Data processing and Analysis

The collected data were coded, cleaned, and entered by epi-data version 4.4.3.1 and exported to STATA version 14 for analysis. Descriptive analysis was carried out and summarized by frequency tables, graphs, and text. Bivariate logistic regression was conducted to identify the variables which were the potential candidate for multivariable logistic regression at a p-value <0.25. Then, those fulfilled entry criteria for multivariable logistic regression were entered into the final model. Multivariable logistic regression analysis was conducted to assess determinants of pelvic organ prolapse among women at a P-value <0.05 and 95% confidence interval of the adjusted odds ratio. The Hosmer Lemeshow statistics were used to check the goodness of fit of the model and variance inflation factor (VIF) was used to assess multicollinearity.

Ethical approval

Ethical clearance was obtained from Arba Minch University, College of Medicine and Health Science Institutional Review Board with IRB reference number of IRB/184/12. A formal letter was written to Arba Minch, Sawla, and Jinka General Hospitals for permission and support by Arba Minch University school of Public Health. Respondents were informed about the objective and purpose of the study and written consent was obtained from each respondent. Similarly, no personal identifiers were used to collect the data, to maintain the confidentiality of the information and privacy. During the data collection period to prevent COVID-19 the data collectors used personal protective equipment like a face mask, hand sanitizer, disposable glove, and physical distancing, and also information was given to inform the respondents about the COVID-19 prevention mechanism. Besides, this study was conducted following the Declaration of Helsinki, and all ethical and professional considerations were followed throughout the study to keep participants' data strictly confidential.

RESULT

Socio-Demographic Characteristics

A total of 339 women (113 cases and 226 controls) participated in the study which yielded a response rate of 97.4%. The mean age was 52 (± 7.4SD) years and 40.3 (± 7.5SD) years for the cases and controls, respectively. The majority of the cases 105 (92.9%) and controls 143 (63.27%) were rural inhabitants. Concerning the level of education 53 (46.9%) of cases and 27 (12%) among controls were unable to read and write. Forty-six (40.71%) of cases and 30 (13.27%) of controls were farmers. (Table 1)

Table 1 Distribution of Socio-demographic characteristics among women at Arba Minch, Sawla, and Jinka general hospitals, Southern Ethiopia

Variables	Categories	Cases Number (%)	Controls Number (%)	COR (95% CI)	P-value
Age of the mother (Years)	<45	24 (21.24)	153 (67.7)	1	
	45-55	40 (35.40)	42 (18.58)	6 (3.29, 11.17)	<0.01
	>55	49 (43.36)	31 (13.72)	10 (5.4, 18.77)	<0.01
Age of the mother at first delivery (Years)	<20	69 (61.06)	31 (13.72)	9.8 (5.77, 16.84)	<0.01
	≥20	44 (38.94)	195 (86.28)	1	
Educational status	Unable to read and write	53 (46.90)	27 (11.95)	21.9 (7.88, 61.3)	<0.01
	Able to read and write	28 (24.78)	45 (19.91)	6.9 (2.48, 19.5)	<0.01
	Primary education	17 (15.04)	30 (13.27)	6.3 (2.13, 18.9)	0.01
	Secondary education	10 (8.85)	68 (30.09)	1.6 (.53, 5.1)	0.387
	College and above	5 (4.42)	56 (24.78)	1	
Marital status	Married	89 (78.76)	207 (91.59)	1	
,	Unmarried (Single Divorced, widowed)	24 (21.24)	19 (8.41)	2.9 (1.53, 5.63)	0.01
Residence	Urban	8 (7.08)	83 (36.7)	1	
	Rural	105 (92.9)	143 (63.3)	7.6 (3.53, 16.42)	<0.01
Occupation of the mother	**Government and Private**	12 (10.62)	91 (40.27)	1	
	Merchant	25 (22.12)	49 (21.68)	3.8 (1.78, 8.36)	0.01
	House wife	30 (26.55)	56 (24.78)	4 (1.92, 8.58)	<0.01
	Farmer	46 (40.71)	30 (13.27)	11.6 (5.45, 24.8)	<0.01
Income	<1000	54 (47.79)	25 (11.06)	14.5 (6.58,32.05)	<0.01
	1000-2999	48 (42.48)	127 (56.19)	2.5 (1.24, 5.19)	0.011
	≥3000	11 (9.73)	74 (32.74)	1	

Obstetric and Gynecologic Characteristics

Eighty-two (72.57%) cases and 64 (28.32%) controls had more than 4 vaginal deliveries. Concerning the place of delivery 67 (59.3) of cases and 55 (24.34%) of controls reported that they gave their last birth at home. Forty-six (40.7%) of cases and 171 (75.66) of controls gave their last birth at health facilities. Regarding mode of delivery 37 (32.7%) of cases and 36 (15.93%) of controls delivered their last child by instrumental delivery and 71 (62.83%) of cases and 145 (64.16%) of controls delivered their last child by Spontaneous vaginal delivery. (Table 2)

Table 2 Distribution of obstetric and gynecologic characteristics among women, at Arba Minch, Sawla and Jinka general hospitals, Southern Ethiopia

Variables	Categories	Cases Number (%)	Controls Number (%)	COR (95% CI)	P-value
Parity	Primiparous and multiparous	**39 (34.51)**	**161 (71.24)**	**1**	
	grand multiparous	**74 (65.49)**	**65 (28.76)**	**4.6 (2.89, 7.61)**	**<0.01**
Number of vaginal delivery	<4	31 (27.43)	162 (71.68)	1	
	≥4	82 (72.57)	64 (28.32)	6.6 (4.04, 11.08)	<0.01
Place of delivery for the last delivery	Home	67 (59.3)	55 (24.34)	4.5 (2.79, 7.33)	<0.01
	Health facility	46 (40.7)	171 (75.66)	1	
Mode of delivery for the last birth	Instrumental	37 (32.7)	36 (15.93)	2 (1.22, 3.60)	<0.01
	Caesarean section	5 (4.4)	45 (19.91)	0.22 (0.08, 0.59)	<0.01
	SVD	71 (62.8)	145 (64.16)	1	
How long did you stay in the labor for the last birth	Prolonged	67 (59.29)	55 (23.34)	4.5 (2.79, 7.33)	<0.01
	Normal	46 (40.71)	171(75.66)	1	
Duration of rest at home after delivery in the last childbirth	<42 day	42 (37.17)	20 (8.85)	6 (3.35, 11.06)	<0.01
	≥42 day	71 (62.83)	206 (91.15)	1	

Medical Related Factors and Household Food Insecurity

The majority 71 (62.83%) of cases and about a quarter 60 (26.50%) of controls had a chronic cough, 48 (42.48%) of cases and 18 (8%) of controls had chronic constipation. Regarding hypertension 35 (30.97%) of cases and 22 (9.73%) of controls had hypertension. Concerning the family history of Pelvic organ prolapse, the majority 63 (55.70%) of cases and 43 (19.03%) of controls had a family history of POP. (Figure 1)

Determinants of pelvic organ prolapse among women

A total of 21 variables with p-value < 0.25 in the bivariate analysis were included in multivariable logistic regression. Age of the mother at first delivery [(AOR=4, 95% CI: 1.48-11.53)], carrying heavy object [(AOR=2.8, 95% CI: 1.9-7.62)], place of previous delivery [(AOR=3.6, 95% CI: 1.37-9.47)], mode of previous delivery [(AOR=3, 95% CI: 1.73-8.44)], family history of POP [(AOR=4, 95% CI: 1.63-11.2)], BMI [(AOR=4, 95% CI: 1.82-12.9)] and household food insecurity [(AOR=3, 95% CI: 1.51-7.75)] were identified as the determinants of pelvic organ prolapse. (Table 3)

Table 3 Multivariable Logistic regression result on determinants of Pelvic Organ Prolapse among women at Arba Minch, Sawla, and Jinka general hospitals, Southern Ethiopia.

Variables	Categories	Cases Number(%)	Controls Number(%)	COR (95% CI)	AOR(95% CI)
Age of the mother at first delivery (Years)	<20	69(61.06)	31 (13.72)	9.8(5.77,16.84)	4(1.48,11.53)**
	≥20	44(38.94)	195 (86.28)	1	1
Place of delivery for the last delivery	Home	67 (59.3)	55 (24.34)	4.5(2.79, 7.33)	3.6(1.37,9.47)**
	Health facility	46 (40.7)	171 (75.66)	1	1
Mode of delivery for the last birth	Instrumental	37 (32.7)	36 (15.93)	2(1.22, 3.60)	3(1.73, 8.44)*
	Caesarean section	5 (4.4)	45 (19.91)	0.22(0.08,0.59)	0.26(.04, 1.50)
	SVD	71 (62.8)	145 (64.16)	1	1
Family history of POP	Yes	63(55.75)	43 (19.03)	5.3(3.2, 8.82)	4(1.63, 11.2) **
	No	50(44.25)	183 (80.97)	1	1
Carrying heavy object	yes	64(56.64)	43 (19.03)	5.5(3.37, 9.15)	2.8(1.9, 7.62)*
	No	49(43.36)	183(80.97)	1	1
Household food insecurity	Yes	65(57.52)	41(18.14)	6(3.7, 10.11)	3(1.51, 7.75)*
	No	48(42.48)	185(81.86)	1	1
BMI	≥25kg/m^2	24(21.24)	27(11.95)	3.6(1.9, 6.8)	4(1.82, 12.91)*
	<18.5kg/m^2	43(38.05)	12(5.31)	14(7.1, 29.8)	2.4(.62, 9.27)
	≥18.5-<25kg/m^2	46(40.71)	187(82.74)	1	1

*=Statistically significant variable at p<0.05, **= statistically significant at p <0.01

DISCUSSION

The study finding showed that the odds of developing POP were 4 times higher among women who had their first delivery below the age of 20 years than those who had their first delivery 20 and above years. This finding is supported by the studies done in Wolita Sodo, Southern Ethiopia [13]. This could be because sphincter muscles together with their surrounding tissues are responsible for protecting or stabilizing all of the pelvic organs in the correct position but if a mother had birth below the age of 20 years these muscles and ligaments can be damaged during delivery predisposes the woman for POP [24]. The odds of developing POP were 3 times higher among those women who carry heavy objects compared to those who didn't carry heavy objects. This finding goes in line with the study done in Bahir Dar, Northwest Ethiopia [12]. This might be due to the reason that most Ethiopian rural women engage in carrying heavy objects during farming, fetching water, and collecting wood which may increase intra-abdominal pressure that results in POP. The odds of developing POP were 3 times higher among women who deliver their last child at home compared to those who deliver at the health facility. This finding is consistent with the studies done in India [15] and Wolita Sodo, Southern Ethiopia [13]. This could be because giving birth at home and delivery supervised by non-health professionals in the home lead to obstetric complications such as prolonged labor, and perineal tear which causes injury to the supporting structures of pelvic organs and predisposes to POP. The odds of developing POP were 3 times more higer among women who gave birth with instrumental assistance compared with those who gave birth with spontaneous vaginal delivery. This finding is similar to the study done in South Australia [14]. This might be because instrumental delivery causes injury to pelvic floor muscle and loss of muscle tone that supports the pelvic organs, this may be a risk factor for the descent to one or more vaginal compartments [25]. The odds of developing POP were 3 times higher among women with food insecure households than in those with food secure households. This might be explained by poor nutritional status is a cause of weakness in the muscles and other supportive structures of the pelvic floor, this may be a risk factor for the development of pelvic organ prolapse [26]. The odds of developing POP were 4 times higher among obese women compared with women with normal BMI. This finding is in line with the studies conducted in India [15] and China [27]. This might be because obesity increases intra-abdominal pressure which causes weakening of pelvic floor muscles and fascia [28]. The odds of developing POP were 4 times higher among women who had a family history of POP compared with those who didn't have a family history of pregnancy. This finding is supported by the studies done in the USA [29], Wolita Sodo, Southen Ethiopia [13], and Bahir Dar, Northwest Ethiopia [12]. The relationship between the family history of POP and the occurrence of POP needs further investigation.

CONCLUSION

In this study age of the mother at first delivery, carrying a heavy object, place of previous delivery, mode of previous delivery, body mass index, family history of pelvic organ prolapse, and household food insecurity were factors found to be significantly associated with pelvic organ prolapse. Therefore, health care professionals should advise mothers to maintain a normal weight, have skillful delivery, and avoid early pregnancy to prevent pelvic organ prolapse. Women in the community should also be screened for food insecurity and connected to the agricultural industry and facilitate small-scale business.

DECELARATIONS

Strength of the study

Pelvic organ prolapse symptom score was used to identify cases of POP which is validated in Ethiopia in Amharic.

Limitation

Identification of cases and control was made entirely based on the response of the participant women.

So, asymptomatic stages of Pelvic organ prolapse may be missed.

Abbreviations

AOR: Adjusted Odds Ratio; BMI: Body Mass index; EFY: Ethiopian Fisical Year; CI: Confidence Interval; COR: Crude Odds Ratio; POP: Pelvic Organ prolapse; POPSS: Pelvic organ prolapse symptom score

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Conflict of interest

We want to reassure you that the material was provided with full accountability and communication. We stated that there are no conflicts of interest with any people or organizations that could unfairly influence or skew the content of the work.

Authors' Contributions

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

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MAGNITUDE AND ASSOCIATED FACTORS FOR SEXUALLY TRANSMITTED DISEASE AMONG HAWASSA INDUSTRIAL PARK WORKERS, SOUTHERN ETHIOPIA

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ABSTRACT

BACKGROUND: Sexually Transmitted Infections are a group of infectious diseases spread through unprotected sexual intercourses and resulting in curable and incurable diseases. Around the world estimated about 376 million people become ill each year with one of four common curable Sexually Transmitted Infections. It is estimated about 86 million new cases of curable STIs occurred in Africa region.

OBJECTIVES: To assess the magnitude and associated factors for Sexually transmitted infections among Hawassa industrial park workers, Southern Ethiopia, 2020.

METHOD: Institution based cross-sectional study design was conducted from July to August, 2020. Self-reported syndromic approach was used to assess magnitude and associated factors for STIs. Multistage sampling technique was used. Both bivariate and multivariable logistic regression analyses were employed. P-value of <0.05 and AOR with 95%CI was used to determine the presence of association between covariates and dependent variable.

RESULT: Self-reported Sexually Transmitted Infection magnitude in the last 12 months was 18.7% (18.54-18.91) among the Hawassa industry park workers. Hometown of residence (AOR=2.03; 95%CI: 1.16-3.55), Poor knowledge of STIs (AOR=2.59; 95%CI: 1.59-4.21,) Drinking alcohol (AOR=3.10; 95%CI: 1.68-5.71) ,View/read pornographic materials (AOR=4.28; 95%CI: 2.63-6.97) and age at first sexual intercourse<18 years (AOR=2.01; 95%CI: 1.23-3.28) were significantly associated with the magnitude of STIs.

CONCLUSION AND RECOMMENDATION: Self-reported magnitude of STIs among HIP was found to be high. Design and implement work place based STI prevention and control programs which focus on reduction of risky sexual practice and promotion of safer sexual practices among these high-risk population is very crucial.

KEYWORDS: STIs, Syndromes, Risky sexual practices, Industry Park.

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INTRODUCTION

Globally, a total of 376.4 million new curable urogenital infections with chlamydia, gonorrhoea, trichomoniasis and syphilis in 15–49-year-old occur among women and men in 2016. This estimate corresponds to an average of just over 1 million new infections each day. [3,4] It is projected about 86 million new cases of curable STIs occurred in Africa regions. [1]

STIs have enormous health, social and economic consequences. The most serious health consequences of STIs, other than HIV/AIDS, tend to occur in women and newborn children. Complications in women include cervical cancer, pelvic inflammatory disease with resulting infertility, chronic abdominal pain, ectopic pregnancy, preterm labor and related maternal mortality. In neonates it results in neonatal death, low birth weight and prematurity, sepsis, pneumonia, neonatal conjunctivitis, and congenital deformities. In addition, the costs of STI drugs may place a heavy financial burden on families, communities and the country at large. Generally, failure to diagnose and treat STIs at an early stage may result in serious complications .[1,2,5–7]

Taking this into account, countries across the world set a goal to end sexually transmitted infection epidemics as major public health concerns. In 2030 its targeted 90% reduction of T. pallidum,90% reduction in N. gonorrhoeae incidence globally and 50 or fewer cases of congenital syphilis per 100 000 live births in 80% of countries. [4]

One of the priority actions to reach the targets is achieving early diagnosis of sexually transmitted infections and linkage to treatment. Globally, one of etiologic, clinical and syndromic diagnostic approach is being used for early diagnosis. However, the syndromic approach has been shown to be highly effective for the management of majority of the STIs in resource limited countries. It helps to have prompt and efficient case detection and treatment, results in immediate health benefits for individual patients. Ethiopia has been implementing syndromic approach since 2001 by adopting the WHO generic guidelines to serve as a national guideline for the management of STIs.[2,8] In the presence of large scale up of health care investments and strategies applied for the prevention and treatment of STIs in Ethiopia the issue continues to be a young adults' health problem. According to Ethiopian demographic and health survey 2016(EDHS 2016), overall 4% of women and men age 15-49 reported having syndromes of STI in the last 12 months. [9] Other studies conducted among Wolaita Sodo University and University of Gonder students shows that self-reported prevalence of STIs to be 19.5% and 18.2%, respectively. [10,11] Similar studies conducted among high school students at Bahir-dar 13.1% reported to have syndromes of STIs. [12]

Factors affecting the high prevalence of STIs, including HIV, have been documented in many epidemiological studies across different populations. Behavioral, socioeconomic and demographic risk factors, including age at first sexual intercourse, inconsistent condom use, having multiple sexual partners, female sex, being single and the partner's sexual behavior, the location and culture are some of them. [3,11–16]

Currently the Ethiopian government came up with the decision to develop and expand industrial parks providing the necessary services and facilities for industries. [17] Industry Parks workers are one of the risk population to acquire STIs. However, there is no information on the prevalence and factors associated with STIs among industry park workers. The availability of epidemiological data on STIs and associated risk factors in this population is essential for the development of successful prevention, diagnosis and management strategies in the country. This study was therefore, conducted to determine the prevalence and risk factors associated with STIs among industry park workers.

METHODS AND MATERIALS

Study area

The study was conducted at Hawassa city which is the capital of the Sidama and Southern Nation Nationalities Peoples Regional State, and located

273 km south of Addis Ababa, the capital city of Ethiopia. The park is developed under the national industrial park development corporation covering a total area of 300 hectares. Currently, about 30,000 workers were hired across the 52 factory sheds of the park.

Study design and period

- Institution based cross-sectional study was conducted among Hawassa industrial park workers from July 26 to August 26, 2020.

Source and study Population

Source population was HIP workers and Workers in randomly selected factory sheds during the study period were Study population.

Inclusion and exclusion criteria

All HIP workers were included, and HIP workers who are severely ill during study period and Recruitment time less than 30 days were excluded.

Operational definitions

- STI cases for Male/Female: They were considered STIs cases if he/she reported at least one of history of urethral discharge, genital ulcer/sores, scrotal swelling, inguinal bubo, abnormal vaginal discharge, or lower abdominal pain syndromes in the last 12 months.

Sample size determination

The sample size was determined using single population proportion formula by taking the prevalence of STIs (19.5%) obtained from a study conducted among Wolaita Sodo University students.[10],Design effect of 2.6,Non-response rate of 15% ,n= 384, Multiplied by design effect of 2.6 and non-response rate (15%) was added.Final sample size (nf) = [(242×2.6) + 15%] =666

Sampling technique and procedures

There are 52 sheds in HIP and about 30,000 regular workers within it. Multistage sampling technique was used to select representative study subjects. Simple random sampling technique (lottery method) was used to select the factory shed from the total of 52 sheds by taking 29% (15 sheds) of the total factory sheds. To assure the representativeness of the data, the sample size was proportionally allocated to all (15 sheds) proportional to their number of workers.

Data collection procedures

Data was collected using structured self-administered questionnaires. The questionnaire was first prepared in English, and translated into Amharic then, translated back into English, to check the consistency. Five data collectors and one supervisor were participated in the data collection process, and monitoring.

Data quality management

One week prior to data collection a pre-test was conducted on 5% (34) of the sample size at MOHA soft drink factory in Hawassa. Depending on the result of pretest, correction and modification were done on questionnaire before applying on the study population.

Data processing and analysis

Data was cleaned, coded and entered in SPSS version 21.0 software for further analysis. Frequencies and cross tabulations were used to summarize descriptive statistics of the data. Tables and texts were used for data presentation. Bivariable logistic regression analysis was used to identify candidate variables for multivariable logistic regression at P-value of ≤0.25. The strength of association was determined using multivariable logistic regression at p-value <0.05, and 95% CI of adjusted Odd Ratio (AOR).

Ethical considerations

Ethical clearance was obtained from the institutional review board of college of medicine and health science of Arba Minch University. Then, permission letter was written to HIP from school of Public Health. Informed written consent was obtained from each participant after informing them the purpose, benefit, risk, confidentiality of the information and the voluntary nature of the participation in the study. The respondents were assured that neither the data collectors nor the supervisors would have access to their responses. During the data collection period, participants were counseled on prevention mechanisms of Covid-19. In addition to this personal protection mechanism; such as, hand washing, face masking and physical distancing were applied for both data collectors and study participants.

RESULTS

Socio-demographic and Economic characteristics

In this study, 647 study participants were involved in the study making a response rate of (97.15%). The mean age of study participants was 27 years (SD ± 3.2 years). Among study participants 118 (17.9%) were male and 531 (82.1%) were females, 520 (80.4%) were single in marital status, and 358 (55.3%) were Protestant. (Table1).

Table 1. Socio-Demographic characteristics of HIP Workers, Southern Ethiopia, 2020.(n=647)

Variables		Frequency	Percent
Sex	Male	116	17.9
	Female	531	82.1
Age	15-19	9	1.4
	20-24	116	17.9
	25-29	405	62.6
	30-34	111	17.2
	35+	6	0.9
Length of Stay at HIP	Less than 6 months	36	5.6
	6-12 months	165	25.5
	Greater than 12 months	446	68.9
Religion	Protestant	358	55.3
	Orthodox	182	28.1
	Muslim	65	10.0
	Catholic	42	6.5
Ethnic groups	Sidama	344	53.2
	Oromo	95	14.7
	Amhara	84	13.0
	Wolayita	62	9.4
	Kambata	34	5.3
	Other*	28	4.3
Marital status	Single	520	80.4
	Married	112	17.3
	Divorced	15	2.3
Living arrangement	Separately	232	35.9
	Friends	197	30.4
	Wife or husband	108	16.7
	Family	72	11.1
	Relatives	38	5.9
Income of respondents	450-1000	24	3.7
	1001-1500	203	31.4
	1501-5000	375	58
	5001-6500	45	7.0
Hometown residence	Urban	246	38.0
	Rural	401	62.0
Education status	Read and write	20	3.1
	Primary	92	14.2
	Secondary	292	45.1
	Diploma and above	243	37.6

*others: Hadiya, Silte, Gurage, Halaba

Knowledge of respondents about STIs

The overall Knowledge of study participants shows that, about 317(49.0%) of the study participants had good knowledge of STIs.

Non sexual behavioral characteristics

Respondents were asked their experience of non-sexual risky practices to assess their exposure to substances and pornographic materials; and the findings shows that, overall, 126 (19.5%) of them used at least one substance in the last 12 months. About 185 (28.6%) of study participants view/ read pornographic materials in the last 12 months (Table3).

Table 3. Non-sexual behavioral characteristics of HIP Workers, Southern Ethiopia, 2020

Variables		Frequency	Percent
Chew khat	Yes	67	10.4
	No	580	89.6
Khat chewing frequency	Daily	6	8.9
	More than once in a week	23	34.3
	Weekly	31	46.3
	Monthly and above	7	10.4
Drink alcohol	Yes	96	14.8
	No	551	85.2
Alcohol drinking frequency	Daily	25	26.0
	More than once in a week	18	18.8
	Weekly	21	21.9
	Monthly and above	32	33.3
Shisha smoke	Yes	16	2.5
	No	631	97.5
Shisha smoking frequency	More than once in a week	3	18.8
	Weekly	3	18.8
	Monthly and above	10	62.5
Over all substance use	Yes	126	19.5
	No	521	80.5
Reason for substance use (n=126)	Satisfaction	76	60.3
	Work hard	13	10.3
	Peer pressure	20	15.9
	Relief tension	17	13.5
View/read Pornographic materials	Yes	185	28.6
	No	462	71.4
Pornography types	Mobile video	99	53.5
	Internet	51	27.6
	Movies or television	31	16.8
	Reading materials	4	2.2

Sexual behavior of the Respondents

About 647 (98.5%) respondents had a history of sexual intercourse in life time. About 577 (89.2%) of the study participants has MSPs in lifetime. (Table4).

Table 4: Sexual practices among HIP Workers, Southern Ethiopia, 2020

Variables		Frequency	Percent
Extra-marital sex(n=112)	Yes	5	4.5
	No	107	95.5
Age at first sex(n=647)	< 18	324	50.1
	≥18	323	49.9
No. of life time sexual partners(n=647)	1	70	10.8
	≥2	577	89.2
Condom ever used(n=647)	Yes	419	64.8
	No	228	35.2
Condom use frequency	Always	119	28.4
	Mostly	141	33.7
	Sometimes	159	37.9
Reason for not use condom always	Trust partner	222	42.0
	Partner refuse	127	24.1
	I didn't get it	73	13.8
	I dislike it	70	13.3
	Ashamed to buy	36	6.8
Sexual intercourse in the last 12 months(n=647)	Yes	619	95.7
	No	28	4.3
No. of sexual partners in the last 12months(n=619)	1	166	26.8
	≥2	453	73.2
Condom use in the last 12 months(n=619)	Yes	221	35.7
	No	398	64.3
Having current sexual partners	Yes	254	38.7
	No	365	61.3
Having sex for the benefit/Gift(n=619)	Yes	29	4.7
	No	590	95.3
Sex after substance use(n=619)	Yes	13	2.1
	No	606	97.9
Sex with CSWs(n=117)	Yes	12	10.3
	No	104	89.7
Condom use with CSWs(n=12)	Yes	8	66.7
	No	4	33.3

Factors Associated with STIs among HIP workers

After adjusting for the possible confounders in multivariate logistic regression analysis variables, Hometown of residence (AOR=2.03; 95%CI: 1.16-3.55), Poor knowledge of STIs (AOR=2.59; 95%CI: 1.59-4.21,) Drinking alcohol (AOR=3.10; 95%CI: 1.68-5.71) ,View/read pornographic materials (AOR=4.28; 95%CI: 2.63-6.97) and age at first sexual intercourse<18 years (AOR=2.01; 95%CI: 1.23-3.28)were significantly associated with the magnitude of STIs.

Table 5: Bivariate and Multivariable logistic regression analysis for factors associated with STIs among HIP workers, Southern Ethiopia, 2020.

VARIABLES		STI		COR (95%CI)	AOR (95%CI)
		Yes	No		
Sex	Male	15(12.9)	101(87.1)	1	1
	Female	106(20.0)	425(80.0)	1.68(0.94-3.00)*	1.86(0.86-4.02)
Marital status	Married	9(8.0)	103(92.0)	1	
	Single	102(19.6)	418(80.4)	2.79(1.36-5.71)	-
	Divorced	10(66.7)	5(33.3)	22.89(6.41-81.62)	-
Age in year	< 24	28(22.4)	97(77.6)	0.93(0.49-1.77)	
	25-29	69(17.0)	336(83.0)	0.84(0.45-1.55)	
	≥30	24(20.5)	93(79.5)	1	
Hometown residence	Urban	30(12.2)	216(87.8)	1	1
	Rural	91(22.7)	310(77.3)	2.11(1.35-3.31)*	2.03(1.16-3.55)**
Income	450-1000	5(20.8)	19(79.2)	2.69(0.65-11.19)	-
	1001-1500	53(26.1)	150(73.9)	3.62(1.24-10.59)	-
	1501-5000	59(15.7)	316(84.3)	1.91(0.66-5.54)	-
	5001-6500	4(8.9)	41(91.1)	1	
Education status	Read & Write	7(35.0)	13(65.0)	3.31(1.23-8.89)*	2.93(0.96-9.01)
	Primary	25(27.2)	67(72.8)	2.29(1.27-4.12)	1.58(0.79-3.17)
	Secondary	55(18.8)	237(81.2)	1.43(0.89-2.27)	1.06(0.60-1.84)
	Diploma & above	34(14.0)	209(86.0)	1	1
Knowledge	poor	85(25.8)	245(74.2)	2.71(1.77-4.15)*	2.59(1.59-4.21)**
	good	36(11.4)	281(88.6)	1	-
Chew khat					
	yes	14(20.9)	53(79.1)	1.16(0.63-2.18)	-
	no	107(18.4)	473(81.6)	1	
Alcohol drink	Yes	33(34.4)	63(65.6)	2.76(1.71-4.44)*	3.10(1.68-5.71)**
	No	88(16.0)	463(84.0)	1	1.00
Shisha smoke					
	yes	4(25.0)	12(75.0)	1.46(0.46-4.62)	
	no	117(18.5)	514(81.5)	1	
View/read Pornography	Yes	63(34.1)	122(65.9)	3.59(2.38-5.42)*	4.28(2.63-6.97)*
	No	58(12.6)	404(87.4)	1	1
Age at first sex					
	<18	81(25.0)	243(75.3)	2.35(1.55-3.57)*	2.01(1.23-3.28*
	≥18	40(12.4)	283(87.6)	1	1
Condom ever used					
	yes	60(14.3)	359(85.7)	0.45(0.31-0.68)	
	no	61(26.8)	167(73.2)	1	

adjusted odds ratio.

DISCUSSION

This study shows that 121 (18.7%) with (95%CI; 18.54-18.91) of sexually active HIP workers had self-reported STIs syndromes in the last 12 months. The finding of this study is comparable with studies conducted among Wolaita sodo university and University of Gondar students, 19.5% and 18.2%, respectively. [10,11] However, it is somewhat lower than studies conducted among young women in Northern Ethiopia 21.3%.[18] This difference could be due to the study subjects of Northern Ethiopia were only women and selection was from health facilities there is a high chance to find suspected cases. While, the finding from this study is higher when compared with the EDHS 2016 national report 4% [9],and population based survey in the city of São Paulo, Brazil 6.3% [13] and School youths at Bahir-dar 13.1%.[12]This could be due to EDHS survey, People living in rural areas of Lucknow and population-based survey in Brazil was community-based, in which most study subjects could be all age groups and also may be differences in data collection method. The difference from study conducted among school youth in Bahir dar may be due to differences in age group, living condition and work habit of the HIP workers.

This study shows that those workers with poor knowledge of STIs were 2.6 times more likely to develop STIs than workers with good knowledge of STIs. The finding consistent with other studies conducted at the Wolaita Sodo university 4.8 times and University of Gondar students 3.3 times more risky than good knowledge of STI. [10,11]Overall, 334 (50.8%) of the study subjects have poor knowledge on STI. This finding was consistent with a studies conducted among University of Gondar students 55.3%, young women in Northern Ethiopia 40.4% and Madawalabu University students 57.5% have poor knowledge of STI. [11,19,20]

This study indicated that having drunk alcohol statistically significant association with risks of STIs. Those workers who had drunk alcohol were about 3.1 times more likely to have risky for STIs when compared to those who didn't drink alcohol. The finding of this studies was consistent with study conducted among the female partners of inmates in Brazil, alcohol drinkers were 1.7 times more likely to have a STI than non-drinkers. [19]

Exposing to pornographic materials could alter the normal sexual desire and care taking of exposure to STIs. This study shows that about 42.8% of respondents were view/read pornography materials in the last 12 months. Those who view/read pornographic materials were 4.4 times more likely to have STI than when compared with those who didn't view/read pornographic materials. The finding was comparable with studies conducted among University of Gondar students, 1.5 times more likely to have an STI than counterpart. [11]

This study shows that those who comes from rural areas where 2.03 times more likely to have the risks for STIs when compared to those who are urban areas. This finding was consistent with community based survey in Adami Tullu, which shows that rural residents where 2.3 times more likely to have STIs than urban residents [21]. This difference may be poor knowledge on transmission and prevention methods of STIs in rural areas. Most of workers came from different rural areas having different cultures and values. They are vulnerable to risky sexual practices in new environment, living away from the family, may limit workers to protect from peer pressure and could also be easily deceived with monetary incentives from persons who seek out sex because low monthly payment in HIP.

To sum up, the study has incorporated many variables and successfully showed important recommendations that can be used in the formulation of interventions to improve the diagnosis and treatment of STI in the area. However, since sexual behavior and practice is a private, intimate and sensitive issue, respondents may feel embarrassed to report syndromes (May subject to

bias). So, self-administered questionnaires were used to keep privacy, and study participants were informed the purpose and confidentiality of the study before data collection. In this study STI was assessed only through the self-report of the workers, no physical and laboratory examination was done and since we are using a syndromic approach, we may miss asymptomatic workers and we may misdiagnose signs and symptoms due to other health problems as similar manifestations with STI syndromes. So under/over reporting of STIs may be possible.

CONCLUSION

The self-reported prevalence of STIs among Hawassa industry park workers was high. Hometown residence, drinking alcohol, view/read pornographic materials and poor knowledge of STIs were factors significantly associated with the magnitude of sexually transmitted infections.

Hawassa city health department needs to address sexual reproductive health promotion, particularly STI prevention and control measures for workers by using condom correctly and consistently, design and implement workplace based STI prevention programs which focus on awareness creation on safer sex practices. Also, Hawassa Industry Park should design and implement awareness creation and risky sexual practices reduction activities through integrating into the workplace, promote condom use, and supply information on their importance was needed.

ABBREVIATIONS

AOR: adjusted odds ratio, COR: crudes odds ratio, CSW: commercial sex workers, EDHS: Ethiopian demographic and health survey, HIP: Hawassa industrial park, HIV/AIDS: Human Immune Deficiency Virus/ Acquired Immune Deficiency Syndrome, STIs: Sexually transmitted infections, and WHO: World Health Organization

DECLARATIONS:

Data Sharing Statement

The data used to support the findings of this study are available from the corresponding author upon request.

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Disclosure

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SEXUAL VIOLENCE AND ASSOCIATED FACTORS AMONG HIGH SCHOOL FEMALE STUDENTS IN DEBRE MARKOS TOWN, EAST GOJJAM ZONE, NORTHWEST ETHIO-PIA, 2021

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ABSTRACT

BACKGROUND: Sexual violence against women takes many forms, including rape, sexual harassment such as asking for unwanted sex as a joke, kissing, touching sensitive parts such as the breasts, and threats. The studies related to the sexual violence in our study setting are limited and the goal of this study was to find out how common sexual violence against women is among Debre Markos high school students, as well as the factors that influence it.

METHODOLOGY: Institutional-based cross-sectional study was conducted among high-school female students in Debre Markos Town. A self-administered questionnaire was used to collect data from 372 respondents. Descriptive, binary, and multivariable logistic regression analyses were carried out.

RESULT: The lifetime prevalence of sexual assault, as well as the lifetime and current year rates of attempted and completed rape, were 110 (29.6%), 18 (4.8%), and 11 (3%) respectively. The mean age of the respondents was 15.75 (SD±1.375) years. Of the respondents who encountered sexual violence, the majority of the respondents were victimized by their boyfriend/husband 9(50%) and much older than their age minimum age 20 and maximum age 26 with a mean age of 23.75 years. Factors asso-ciated with sexual violence were family control (AOR = 22.14, 95% CI 10.58-46.30), habit of drink-ing alcohol (AOR = 0.386, 95% CI 0.189-0.788), academic performance (AOR = 0.246, 95% CI 0.064-0.943), age of respondents (AOR = 0.246, 95% CI 0.064-0.943) and permanent residence (AOR = 2.922,95% CI 1.175-7.265).

CONCLUSION: The current study showed that sexual violence, in general, is high among female students. Family control, the habit of alcohol intake, academic performance, permanent residence, and age of the respondents were identified as the main associated factors for sexual violence of female students in the study area. This needs further intervention like awareness creation in school and community settings, empowering girls in different activities at school, and at a higher institutional level.

KEYWORDS: Sexual Violence, Prevalence, Factors, Female Students, Ethiopia

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INTRODUCTION

Sexual violence is violating the rights entitled to and critically endangering women's mental and physical well-being, and sexual and monetary security [1]. sexual violence has a significant detrimental effect on population health, and it can take many different forms, such as rape, sexual harassment such as asking for uninvited sex in jest, kissing, touching sensitive organs like the breast, and threats. Other possible effects include unintended pregnancy, STDs, depression, and thoughts of or attempts at suicide [2, 3].

The World Health Organization (WHO) has made statements in recent years about the public health significance of violence against women as a result of growing awareness that violence is a serious violation of women's human rights, a major cause of injury, and a risk factor for many physical and psychological health issues [3].

Because the problem is hidden, it is challenging to get data on sexual assault in women, and sometimes the problem is underreported. However, studies conducted in various parts of the world show that sexual violence against women and girls is widespread; in rural Tanzania, 47% [4], in Botswana schools, 67% [3], in Germany, 5% [5], and in Canada and the United States, it was discovered that between 27 and 34% of women interviewed had experienced sexual abuse at some point in their lives. [5, 6].

In rural Ethiopia, 49% of women in partnership have ever experienced physical violence by an intimate partner, including rape, and sexual harassment [2, 3]. Another study conducted in Addis Ababa and Western Shoa among 1401 female high school students shows that the prevalence of completed rape and attempted rape among female students was 5% and 10%, respectively [9].

The studies in Ethiopia on sexual violence are few irrespective of the different lifestyles, customs, and cultures of the society [10]. Furthermore, the frequency of sexual violence and the factors that contribute to it among high school female students in DM town remained unknown. As a result, the purpose of this study was to determine the prevalence of sexual violence among high school female students in the DM town, as well as the factors that contribute to it, and to offer interventional techniques to address the problem when appropriate. As a result, the goal of this study is to generate new data on the prevalence of sexual violence and the factors that contribute to it for residents of DM town and its surrounding areas, to provide useful information to policymakers, health care providers, stakeholders, religious and public leaders, and civil society organizations.

METHOD AND MATERIALS

An institution-based cross-sectional study design was conducted from May 1 to July 10, 2021, in DM town, East Gojjam Zone, North West Ethiopia. The sample size was calculated using a single population proportion $\frac{(n=((Z\ a/2)^2\ P\ (1-P))}{D^2\ )}$, and considering the 95% confidence interval, 5% margin error, and the prevalence of sexual violence 32.8% [11] and a non-response rate of 10%; the final sample size was 372. Those who systematically selected regular high school female students of grades from 9 - 12 who lived in the DM town for at least 6 months and above were included in the study; among them, those students who were disabled were excluded from the study.

Data collection procedure and quality assurance

A total of four government-owned secondary schools are found in the town and all would be included in the study. The total sample size was allocated to the selected schools based on the probability proportional to the size of the number of students in the school. To draw the respective students from each class, the proportional allocation method was used. Finally, a systematic random sampling method would be used to select the desired number of students from each school. In case the student selected was absent or not eligible, the next female student will be selected. Individual schools' lists are used as a sampling frame. Samples to each selected school were assigned proportionally.

To assure the quality of data, the collected data were reviewed and checked for completeness and relevance each day. After checking its completeness, the collected data were first coded, entered, and cleaned using EpiData version 4.6 and then exported into the SPSS version 26 software for analysis. Appropriate descriptive analysis and bivariate, and multivariate logistic regression was employed. Those variables having a p-value less than 0.25 in the bivariate logistic regression were reanalyzed using the multivariate logistic regression. During multiple logistic regression analyses, the variables with $P < 0.05$ at a 95% confidence interval were considered statistically significant factors associated with the presence of sexual violence.

Ethical Consideration

A letter of ethics clearance was obtained from the DMU School of Medicine after approval of the proposal. The study was conducted under the Declaration of Helsinki. The official permission was taken from the school director then, informed consent was obtained from each participant. The privacy and confidentiality of the information was kept secret. The rights of individuals must be protected.

Measurements and Definitions

Rape: to commit sex using force when a female doesn't want to.

Attempted rape: an attempt/trial to have non-consensual intercourse with a female student where she was having a chance of escaping the attempt.

Sexual harassment: refers to an intended, strong verbal expression and threat against female students when somebody (perpetrator) failed his plan to gratify one's sexual interest which is unwelcome by the recipient.

Sexual violence: is defined in this study defined as asking for unwanted sexual intercourse through joking, touching sensitive body parts like breasts, and or unwelcome kiss on a female student.

RESULTS

Sociodemographic characteristics

A total of 372 female students participated in the study with a 100% response rate. Based on the sample size among the total respondents 50 (13.4%) in the ninth grade, 79 (21.2%) in the 10^{th} grade, 198 (53.2%) in the 11th grade, and 45 (12.1%) in the 12^{th} grade. The mean age of the respondents was 15.75 (SD ±1.375) years. Among the total of respondents, the predominant religion was orthodox 369 (99.2%) and the ethnic group of all respondents was Amhara. The majority 358 (96.2%) of respondents were never married, and 286 (76.9%) of respondents' usual place of residence was a rural area. Regarding current living conditions, 258 (69.4%) were reported to live together with both parents and 95 (25.5%) of the respondents lived alone.

Among 372 respondents, 300 (80.6) sources of income were their parents and 31 (8.1%) were their husbands/boyfriends, 324 (87.1%) respondents were having average academic performance and only 19 (5.1%) were having good and above academic performance.

Table 1: Sociodemographic characteristics of high school female students in Debre Markos town, northwest Ethiopia, 2021.

Variables and Category	Number	Frequency %
Age group		
12-16 years	160	43
17-20 years	212	57
Marital status of respondents		
Married	14	3.8
Single	358	96.2
Grade level of respondents		
Grade 9	46	12.4
Grade 10	80	21.5
Grade 11	192	51.6
Grade 12	54	14.5
Ethnicity		
Amhara	372	100
Religion		
Orthodox	369	99.2
Muslim	2	0.5
Protestant	1	0.3
Permanent residence		
Urban	109	29.3
Rural	263	70.7
Source of income		
Parents	300	80.6
Relatives	35	9.4
Boyfriend/husband	30	8.1
Self-support	7	1 .9
Academic performance of the respondents		
Good and above	40	10.8
Average	325	81.1
Low	30	8.1
Total	372	100
Duration of living in Debre Markos		
<one year	36	9.7
>one year	336	90.3
Currently, live with		
Both parents	249	66.9
Alone	108	29
Relatives	8	2.2
Boyfriend /husband	7	1.9
Family control		
Tight	84	22.6
Medium	224	60.2
Free	64	17.2

The sociodemographic character of the family

Of the total of 372 respondent's majority of 273 (73.4%) of their family income were average and 59 (15.9%) were low, 244 (65.6%) of respondent's fathers were unable to read and write, 111 (29.8%) were up to 8th-grade level, 13 (3.5%) were up to secondary school level and 4 (1.1%) were diploma and the majority of respondents mother educational level 265 (71.2%) were unable to read and write, 93 (25%) 8th grade complete, 7 (1.9%) were 10th grade complete and 7 (1.9%) were diploma and above.

Table 2: Frequency distribution of parent or family history of female high school students in De-bre Markos town, East Gojjam, Zone, Amhara Region, Ethiopia 2021 G.C.

Variables and Category	Number	Frequency %
Level of income		
Good and above	39	10.5
Average	274	73.7
Poor	59	15.9
Educational status of the father		
No education	244	65.6
Primary school	111	29.8
Secondary school	13	3.5
Diploma and above	4	1.1
Educational status of a mother		
No education	265	71.2
Primary school	93	25.0
Secondary school	7	1.9
Diploma and above	7	1.9
Do father and mother live together		
Yes	348	93.5
No	24	6.5

Behavioral-related factors of respondents

In this study of the total of 372 respondents, 79 (21.2%) have a history of drinking alcohol in their lifetime, 293 (78.8%) had no history of drinking alcohol, l.5 (1.3%) had experienced in chewing chat, 1 (0.3%) have experienced smoking cigarettes and 5 (1.3%) of respondents' friends use a substance such as chat, alcohol, and the like in their lifetime.

Table 3: Frequency distribution of factors associated with sexual violence among female high school students in Debre Markos town, Ethiopia, 2021GC.

Variable	Frequency	Frequency in%
Alcohol drinking		
Drinking alcohol	79	21.2
Didn't drink alcohol	293	78.8
Chewing chat		
Chewing chat	51.3	
Didn't	367	98.7
Cigarette smoking		
Smoking cigarette	10.3	
Didn't smoke a cigarette	371	99.7
Substance use		
Substance use of friends	51.3	
Didn't use a substance	367	98.7

The sexual history of the respondents

In this study, of a total of 372 participants, 17 (4.6%) of them had boyfriends or husbands and 16 (4.3%) of them engaged in sexual activity. The mean age at first sexual intercourse was 15.75 years, with the minimum age being 14 and the highest being 17 years. Nine (56.3%) of those who began having sex did so because they were married, four (25%) because forced by love affairs, and three (18.8%) because of forced by their boyfriends and teachers. 12 (80%) of those who engaged in sexual activity did so under duress, and 3 (20%) did so out of love. Almost all of those involved in sexual activity had sex with considerably older offenders. In terms of sexual harassment, out of the total respondents, 113 (30.4%) had experienced unwanted sex, such as asking for sex in jest or touching delicate body parts like the breasts.

Table 4: frequency distribution of sexual history by respondents, Debre Markos town, Ethiopia, July 2021.

Variables	Number	Frequency %
Having a boyfriend/husband		
Yes	25	6.7
No	347	93.3
Having sexual intercourse		
Yes	16	4.3
No	356	95.7
Age at 1st sexual intercourse		
12-16	12	75
17-20	4	25
Sexual violence		
Yes	110	29.6
No	264	70.4
History rape		
Yes	18	4.8
No	354	95.2
A consequence of the raped girl		
Depressed	15	4.0
STI	1	.3
Being pregnant	2	.5
Age of rapper		
17-20	1	.3
≥20	17	4.6
Place of rape		
School	5	1.3
Road	12	3.2
Home	1	.3

Factors associated with sexual violence against female high school students at Debre Markos town. Binary and multiple logistic regression analyzes were done using the backward logistic regression method to analyze factors associated with lifetime and current year sexual violence. As shown in Table 5 after controlling for the effect of confounders, age, academic performance, family con-trol, having a boyfriend/husband, permanent residence, a habit of drinking alcohol, and whether parents living together were associated with lifetime sexual violence.

Multivariant regression analysis revealed that as the age of female students is increases, the risk of having sexual violence is decreasing which means 51.2% of female students above the age of 17 years protected from sexual violence (AOR = 0.512 95% CI 0.264-0.996). The academic perfor-mance of female students had a significant association with lifetime sexual violence. Students with good and above grades on the exam were protected by 24.6% from sexual violence (AOR = 0.246, 95% CI 0.064-0.943). Family control was shown to have a significant association with lifetime sex-ual violence. The odds of having sexual violence were 22 times more among female students who didn't have family control than those having tight family control (AOR = 22.14, 95% CI 10.587-46,303). The lifetime experience of drinking alcohol had a significant association with lifetime sexual violence. Of those female students who didn't drink alcohol 38.6% were protected from sexual violence (AOR = 0.386, 95% CI 0.189-0.788). Permanent residence of female students has a significant association with lifetime sexual violence. The odds of having sexual violence were 3 times greater among female students whose permanent residence is urban as compared to those who live in rural areas (AOR = 2.922, 95% CI 1.175 - 7.265).

Table 5 Multivariate analysis showing the association of factors with lifetime sexual violence among female students in Debre Markos Town, Northwest, Ethiopia, July 2013EC.

Variable	Sexual violence		COR (95% CI)	AOR (95% CI)	p value
	Yes	No			
Age of respondents					
12-16	30 (18.7)	130 (81.3)	1	1	
17-20	83 (39.2)	129 (60.8)	2.778 (1.719,4.521)	0.512 (0.264,0.996)	0.049
Academic performance of respondents					
Good and above	27 (67.5%)	13 (32.5)	7.321 (3.268,16.403)	0.244 (0.064,0.936)	0.040
Average	70 (23%)	232 (77)	0.297 (0.117,0.758)	2.347 (0.803,6.861)	0.119
Low	16 (53.3)	14 (46.7)	1	1	≤0.01
Permanent residence					
Urban	9 (10.5)	77 (89.5)	0.205 (0.098,0.0425)	2.922 (1.175,7.265)	0.021
Rural	104 (36.3)	182 (63.7)	1	1	≤0.01
Family control					
Tight	16 (22.2)	56 (77.8)	3.469 (1.593,7.555)	9.586 (4.082,22.513)	
Medium	14 (7.6)	170 (92.4)	0.114 (0.057,0.226)	22.205 (10.606,46.486)	≤0.01
Loose	83 (71.5)	33 (28.5)	1	1	≤0.01
Are father and mother live together					
Yes	101 (29)	247 (71)	10.848 (5.40,21.78)		
No	12 (50)	12 (50)	1		
Lifetime prevalence of drinking alcohol.					
Yes	46 (58.2)	33 (41.8)	4.702 (2.785,7.938)	0.386 (0.189,0.788)	0.009
No	67 (22.8)	226 (77.2)	1	1	
Having boyfriend /husband					
Yes	29 (67.4)	14 (32.6)	0.166 (0.083,0.328)		
No	84 (25.5)	245 (74.5)	1		

DISCUSSION

This study shows that sexual violence is a public health problem among female high school students in Debre Markos town. We found that the prevalence of sexual violence, associated factors, and effects of sexual violence were assessed and the lifetime prevalence of sexual violence among high school female students in the study area was 110 (29.6%). This finding is lower than the studies conducted in Dabat (33.3%) [11], Butajira (32.8%) [12], and Bahir Dar 37.3% [13]; this could be due to differences in living conditions, as well as lifestyle. However, this finding was higher as compared with finding from DILLA town (13.5%) [14]. This variation might be due to various factors like culture, ethnicity, lifestyle, socioeconomic status, and living environment.

Regarding factors associated with sexual violence in this study, family control, the habit of alcohol intake, academic performance, permanent residence, and age of the respondents were the im-portant contributing factors to the presence of sexual violence in female students. More specifical-ly the finding of this study showed that those respondents who have tight family control have 22 times more likely to experience sexual violence. This is because those females cannot tackle the challenges. Females who have used alcohol have a higher probability of experiencing sexual vio-lence. When we compare with other past studies on sexual violence, a study conducted in Dilla town showed that the habit of alcohol intake had been identified as the most significant factor for sexual violence [14].

The findings of this study revealed that academic performance was one of the most important associated factors of sexual violence among female high school students in Debre Markos town (AOR = 0.244,95% CI,0.064,0.936). Those students who had good and above grades were pro-tected from sexual violence as compared to those who scored low grades in exams. Permanent res-idence and age of female students were also other contributing factors of sexual violence among female students in the study area with (p = 0.021) and (p = 0.049), respectively. Findings of this study showed that female students who come from urban were at risk of sexual violence as com-pared to those who come from a ruralareas with (AOR = 2.922,95% CI,1.175,7.265), and female students whose ages were between 12-16 were protected from sexual violence with (AOR = 0.512,95% CI,.064,0.996) as compared to those whose age 17 and above.

The current and lifetime prevalence of both attempted and completed rape in the study area was 11 (3%) and 18 (4.8%) respectively. This finding was lower than a similar study conducted in Addis Abeba (8.8%) [15], and Debark (10%) [4]. This might be due to variations in living conditions, and lifestyle and increase awareness about rape and its consequence.

Of the total attempted and completed rape 5(27.5%) occurred at school, 12 (66.7%) happened on roads, and one at victims' homes, this finding is almost comparable with similar studies done in Dabat [11], Debark [4], and Dilla town [14]. Most of the rapists were boyfriends/husbands (50%), whereas relatives were 3 (16.7%) and neighbors 6 (33.3%). In this study, almost all perpetrators were known by the victim but only 4 (22.2%) victims have applied the case to the police or legal system. However, a similar study conducted in ADDIS ABABA in two hospitals revealed that there is a significant delay in reporting cases to health institutions and the police [16]. In the study done in Adigrat hospital, 42% of rapists were arrested by the police, even though 90% rapists were known by the victim. Most of the perpetrators used force 16 (88.8%) to rape the victims. In this study unwanted pregnancy, sexually transmitted infection, depression, and psychological trauma were identified as the main consequences that a raped high school student experienced. A similar study conducted in Jimma town showed that Unwanted pregnancy, trauma to the genital area, and psychological trauma were shown to be the consequences of sexual violence [17].

CONCLUSION

This study revealed that sexual violence is a problem with all its negative effects among female students in the study area. The lifetime prevalence of sexual violence was 29.6% and the lifetime and current prevalence of rape in the study area was also 4.8% and 4%, respectively. The lifetime prevalence of sexual violence was highly associated with family control, alcohol intake habits, academic performance, permanent residence, and age. unwanted pregnancy, depression, sexually transmitted infections, and psychological trauma were identified as the main consequences of rape.

This needs further intervention like awareness creation in school and community settings, empowering girls in different activities at school, and at a higher institutional level.

DECLARATION

Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
DMU	Debre Markos University
DM	Debre Markos
DEVT	Development
HIV	Human Immunodeficiency Virus
EDHS	Ethiopian Demographic Health Survey
MSC	Master of Science
PTSD	Post Traumatic Stress Disorder
STDs	Sexually Transmitted Diseases

Consent to publish

Not applicable

Availability of data and materials

The data used to support the finding of this study are available from the corresponding author upon request.

Competing of interests

The authors declare that they have no competing interests regarding the publication of the paper.

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Authors Contribution

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or critically reviewing it for important intellectual content; agreed to submit it to the current journal; gave final approval of the version to be published, and agreed to be responsible for all aspects of the work

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UTILIZATION OF LONG-ACTING REVERSIBLE CONTRACEPTIVES AND ASSOCIATED FACTORS AMONG FEMALE HEALTH CARE PROVIDERS IN GAMO AND GOFA ZONE HOSPITALS, SOUTHERN ETHIOPIA: CROSS-SECTIONAL STUDY, 2021

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ABSTRACT

BACKGROUND: Female health care providers' use of family planning is critical for the community, as it encourages the use of long-acting family planning methods. But there is a paucity of studies on the utilization of long-acting reversible contraceptives (LARCs) and associated factors among female health professionals.

OBJECTIVE: To assess the utilization of LARCs and associated factors among female health care providers in Gamo and Gofa Zone Hospitals in 2021.

METHOD: An institution-based cross-sectional study was conducted among randomly selected 464 female health care providers working at Gamo and Gofa Hospitals, Southern Ethiopia. The data was collected by a pre-tested interviewer-administered questionnaire. Binary logistic regression analyses with a p-value <0.05 was used to declare statistical significance.

RESULT: The utilization of LARCs among female health care providers was 28.8%. Earning ≥5000 family monthly income [AOR=2.005; 95% CI: 1.236-3.251], desire to have 0-2 children [2.147; 1.249-3.693], good knowledge on LARCs [2.320; 1.236-3.251], age 25-34 years [2.407; 1.240-4.672], being ≥18 age at first sexual intercourse [0.401; 0.219-0.734] and being trained on family planning methods [3.460; 1.203-4.589] were positively associated with utilization of LARCs.

CONCLUSION: The study revealed that utilization of LARCs among female health care providers in Gamo and Gofa zone hospitals was low. Age 25-35 years, earning ≥5000 families monthly income, having good knowledge of LARCs, desire to have 0-2 children, being trained on family planning, and starting sexual intercourse ≥18 years were significantly associated with the utilization of LARCs. Providing training and intensifying information dissemination on LARCs is essential.

KEYWORDS: Long-acting reversible contraceptives, Utilization, Female health care provider

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INTRODUCTION

Long-acting reversible contraceptives (LARCs) are birth contraceptives that prevent pregnancy for a long period without requiring user activity. Implants and intrauterine contraceptive devices (IUCDs) are examples of these approaches [1]. Globally in 2019, 44 percent of women of reproductive age were using a modern method of contraception. Although the use of modern contraception in 2019 was lower in Sub-Saharan Africa (SSA) compared to other regions, several countries in this region have seen a significant increase in recent years [2]. According to several researchers, the utilization of long-acting reversible contraceptives is low, with 13 percent of the world's population using them and 2 percent in Sub-Saharan Africa. [3]. The utilization of modern contraceptives was steadily increased over the last two decades in Ethiopia. But the utilization of long-acting reversible contraceptives (LARCs) is still low compared to short-term contraceptives [4].

In Ethiopia, the maternal mortality ratio is still too high with 412 per 100,000 live births in 2016. Also shares a high burden on infant and neonatal mortalities with 48 and 29 per 1,000 live births, respectively. Also, Ethiopia is one of the most populated countries in Africa making it the second nation in Africa with a total fertility rate of Ethiopia is 4.6 children per woman [5,6]. One major reason for the persistent high fertility level and high maternal and child mortality rate across SSA including Ethiopia is the low level of contraceptive uptake and high unmet needs for contraceptives [7].

A study done in Ethiopia Gojjam town showed that the utilization of long-acting reversible contraceptives among female health care providers was 22.7% which is low. A supportive attitude of their husbands/partners, low economic status, supportive attitude towards the utilization of long-acting contraceptive methods, and the desire to have 0–2 children were associated factors for the utilization of long-acting contraceptive methods [8].

The Ethiopian reproductive health strategy prioritizes the provision of all family planning (FP) methods, with a particular focus on long-acting reversible contraceptives (LARCs), as a key strategy for achieving the strategy's primary goals of reducing unwanted pregnancies and enabling individuals to have desired family size [9]. Based on a study conducted in the United States peers and providers strongly influence women's decision to use (IUCD) and disclosure of personal use of IUCD by a provider increased choosing of methods during counseling of clients [10]. The use of health services, particularly family planning, by female health care professionals is very essential for the community and encourages the use of health services, particularly long-acting family planning methods. But there is a scarcity of study that shows the utilization of LARCs and factors affecting it among female health care providers. So this study aimed to assess the utilization of LARCs and associated factors among female health care providers in Gamo and Gofa Zone, Southern Ethiopia.

METHOD

Study design

An institution-based cross-sectional study design was conducted.

Study setting and Population

The study was conducted in Gamo and Gofa zone hospitals, in Southern Ethiopia. Gamo and Gofa zone are in the Southern Nations, Nationalities, and Peoples' Region of Ethiopia. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), this Zone has a total population of 1,659,310 of whom 779,332 are men and 879,782 women; with an area of 18,010.99 square kilometers [11]. There are around five and two hospitals in Gamo and Gofa zone respectively. The hospitals provide preventive and curative services for the community and comprise all types of health professionals, like physicians, specialized doctors, nurses, health technology technicians, lab technicians, pharmacies, etc. The total number of female health care providers in these hospitals was 641. This study was conducted from March 18 to May 18, 2021. The source populations were all female health care providers who were working in Gamo and Gofa zone hospitals. Whereas, the study

population was all female health care providers who were working in selected Gamo and Gofa zone hospitals during the data collection period.

Inclusion criteria

All female health care providers were in the reproductive age group (15-49).

Exclusion criteria

All female health care workers who were pregnant, unmarried, and infertile during the data collection period were excluded.

Sample size determination

A total of 464 sample size was calculated by using single population proportion formula based on the following assumption; the proportion of 22.7 % for utilization of long-acting reversible contraceptives among female health care providers in east Gojam district (8), 95% confidence interval, 4% margin of error and 10% non-response rate.

Sampling procedure and technique

All the seven hospitals in Gamo and Gofa zone were included in the study. Proportional allocation was made to all hospitals based on the number of female health care providers available. The lists of female health care providers were obtained from the hospital human resource management office and the identification number was given to each provider and a simple random sampling technique by using a computer generating method was used to select study participants (Figure 1).

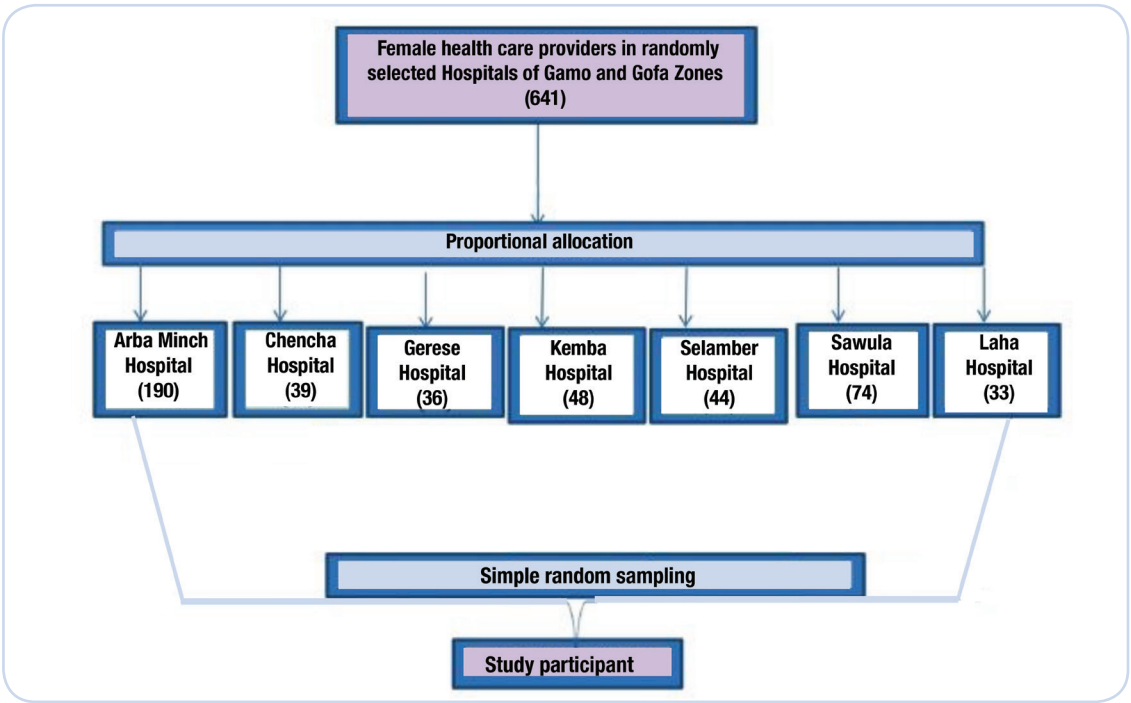

Figure 1: Presentation of sampling procedure on utilization of long-acting reversible contraceptive methods and its associated factors among female health care providers in Gamo and Gofa Zone Hospitals Southern Ethiopia in 2021.

Operational definition

Utilization of Long-acting reversible contraceptive: Currently a woman who uses at least one of the long-acting reversible family planning methods [12].

Long-acting reversible contraceptives: are methods of birth control that provide effective contraception for an extended period without requiring user action and return fertility after the removal which are implants and IUCD [1].

Positive Attitude: From six attitudes measuring questions those who scored mean and above mean the correct answers from attitude measuring of LARCS [12].

Negative Attitude: From six attitudes measuring questions those participants who scored below mean to the correct answers [12].

Good knowledge: From eight knowledge measuring questions those who scored mean and above mean

the correct answers from knowledge measuring of LARCS [13].

Poor Knowledge: From eight knowledge measuring questions those who scored below mean to correct answers from knowledge measuring of LARCS [13].

Data collection tool and technique

A structured self-administered questionnaire adopted from different works of literature was used to collect the data [12,13]. The questionnaire contains socio-demographic characteristics, reproductive health factors, Knowledge and attitude-related factors, and utilization of long-acting contraceptive parts. The questions and statements were grouped and arranged according to the particular objectives that they have to address. Seven diploma nurses and one BSC level health professional were recruited and trained as data collectors and supervisors, respectively.

Data quality assurance

The questionnaire was translated from English to Amharic and then back to English with language experts to keep consistency. A pretest was conducted on 23 female health care providers (5%) of the sample before collecting the data on Gidole Hospital. The data collection training was given for one day concerning the aim of the study, the contents of the questionnaire, the definition of terms in the questionnaire, and issues of confidentiality and privacy. Collected data was checked for incompleteness and inconsistency by the supervisors and principal investigators. The necessary feedback was given to the research team before the actual procedure was started. Data clean-up and cross-checking were done before analysis.

Data processing and Analysis

The data obtained from each respondent was entered using Epi-data version 7.1 and exported to SPSS version 24 for analysis. Data were coded, cleaned, and analyzed using SPSS version 24 software. Descriptive statics (frequency, mean and standard deviation) was used to describe the study population with relevant variables. Bivariate and multivariate regression was performed to assess the presence of an association between the independent variable and dependent variable. Those candidate variables at Bivariate logistic regression with a p-value <0.25 were moved to the Multivariate logistic regression model for the dependent variables to control potential confounding variables and model fitness (goodness of fit) was checked by the Hosmer Lemeshow test. P-value<0.05 at multivariate analysis was considered statically significant to this study.

Ethical approval

Ethical clearance letters were obtained from the institutional review board (IRB) of Arba Minch University, College of Medicine and Health Sciences with IRB number IRB/1096/21. Official letters were received from the department of public health and were submitted to the selected hospital management office. The aim of the research was explained to the study participants. Written Informed consent was obtained from respondents during data collection. Respondents were informed that participating in the research is not harming them. The right to withdraw their consent whenever they want was also respected. All data collectors and supervisors used personal protective equipment based on WHO standards during the training and data collection period to prevent the COVID 19 pandemic disease transmission. Besides, this study was conducted following the Declaration of Helsinki, and all ethical and professional considerations were followed throughout the study to keep participants' data strictly confidential.

RESULT

Socio-demographic characteristics

A total of 464 female health care providers were included in the study with a response rate of 100%. The mean age of female health care providers was 30.47 with a standard deviation (SD) ± 5.73 years. More than half 262(56.5%) of study participants were from Gamo ethnic group and 207(44.6%) were orthodox religious followers. Among study participants 403 (86.85%) were married and 266 (57.3%) had a diploma level of education. Regarding the occupation of their husbands, 255(55%) were governmental employers. The majority of the study participants were nurses 150 (32.3) and followed by midwifery 94 (20.2%) a profession (Table 1).

Table 1: Socio-demographic characteristics of female health care providers in Gamo and Gofa zone hospitals, southern Ethiopia in 2021(N=464)

Variables (464)	Categories	Frequency	Percent
Age (years)	15-24	54	11.60
	25-34	296	63.80
	35-49	114	24.60
Religion	Orthodox	207	44.60
	Protestant	212	45.60
	Muslim	27	5.80
	Other	18	3.70
Ethnicity	Gamo	262	56.50
	Wolayta	57	12.30
	Amhara	37	8.00
	Gofa	93	20.00
	Others	15	3.23
Marital status	Married	403	86.85
	Others	61	13.15
Educational status	Diploma	266	57.30
	Degree and above	187	40.30
	Others	11	2.40
Profession	Nurses	150	32.30
	Midwifery	94	20.20
	Laboratory	70	15.00
	Health officer	54	11.70
	Pharmacy	40	8.60
	HIT	39	8.40
	Other	17	3.70
Occupation of the husband	Governmental employer	255	55.00
	Self-employer	102	22.00
	Merchants	97	21.00
	Others	10	2.00
Monthly income of family (Ethiopian Birr)	<5000	211	45.50
	>=5000	253	54.50

Reproductive health history

Of 464 study participants majority 302 (65.09%) of the respondents started their first sexual intercourse 18 years and above. Of a total of respondents who gave birth 338 (72.83%) of them give birth after the age of 18 years. About 121 (26.1%) of the participants had given birth 3-to 4 times (Table 2).

Table 2: Reproductive health history of female health care providers in Gamo and Gofa zone hospitals, Southern Ethiopia in 2021(N=464)

Variables (464)	Categories	Frequency	Percent
Age at first sex	<18 years	162	34.91
	>=18 years	302	65.09
Ever gave birth	Yes	376	81.03
	No	88	18.97
Age at first birth	<18 years	38	8.20
	>=18 years	338	72.83
Number of birth given	1-2	225	48.46
	3-4	121	26.10
	>=5	30	6.47
Number of alive children	<=2	235	50.60
	>2	141	31.00
Ever had abortion	Yes	57	12.28
	No	407	87.72

Knowledge and attitude toward long-acting reversible contraceptive

Concerning the knowledge of study participants to ward LARCs 366 (78.9%) of respondents had good knowledge about LARCs and 281 (60.6%) of female health care providers had a favorable attitude toward the utilization of LARCs.

Ever use of modern contraceptives and training

Of a total of 464 female health care providers, 304 respondents ever used different types of modern family planning methods. The majority 36.6% of respondents had ever used implants. One hundred ninety-nine respondents had ever used long-acting reversible contraceptives and most of the method ever used by respondents was implants 36.6%. About 331(71.35%) respondents were not trained on family planning methods (Table 3).

Table 3: Ever use of modern family planning methods among female health care providers in Gamo and Gofa zone hospitals, southern Ethiopia, in 2021(N=464)

Variables (464)	Categories	Frequency	Percent
Had ever used modern family planning methods?	Yes	304	65.51
	No	160	34.48
What type of modern contraceptive did you use	Pills	52	1.20
	Injectable	111	24.00
	Implants	91	19.60
	IUCD	13	2.80
	Condoms	37	7.90
The shift from one method to another?	Yes	98	32.20
	No	206	67.80
Methods shift	Long to long contraceptives	12	8.05
	Long to short contraceptives	30	20.13
	Short to long contraceptives	38	8.19
	Short to short contraceptives	18	12.08
Reason to change from one contraceptive to another	For the inconvenience of previous methods	59	18.73
	For the convenience of previous methods	37	11.75
	Lack of access to previous methods	6	2.00
	Due to side effects	51	16.20
	Need for long-acting methods	22	6.90
	Provider advise me	16	5.07
	Partner influence	9	2.86
Had trained on family planning methods	Yes	133	28.70
	No	331	71.30

Utilization of long-acting reversible contraceptive

The current utilization of long-acting reversible contraceptives among female health care providers was 28.8%. Most female health care providers used implants 118 (25.8%) and followed by IUCD 14 (3%) (Figure2).

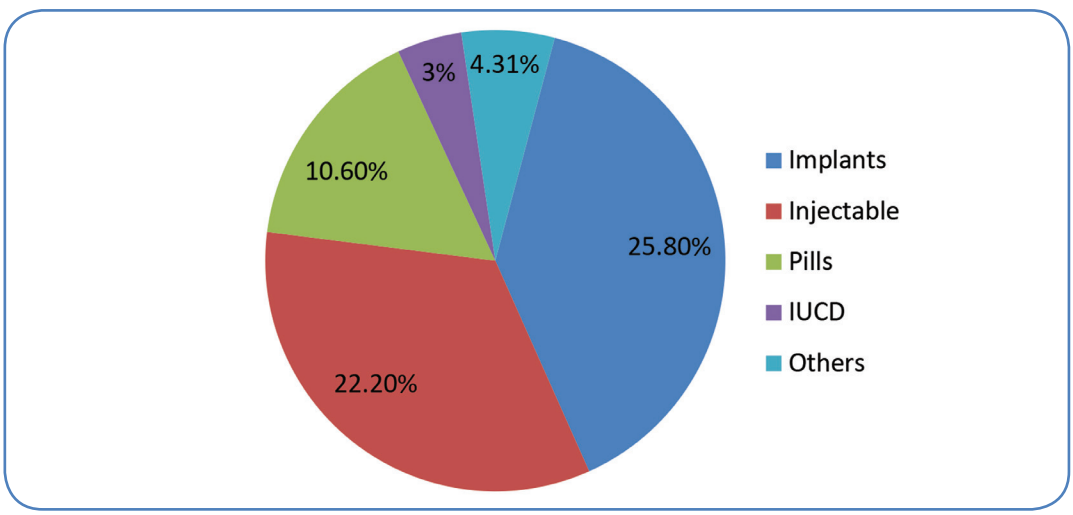

Figure 2: Current utilization of modern family planning methods among female health care providers in Gamo and Gofa zone hospital, southern Ethiopia in 2021

Factors associated with the utilization of long-acting reversible contraceptive

In the study age, women's level of education, monthly income of the family, age at first sexual intercourse, number of birth given, number of children alive, the desired number of children, knowledge of LARCs, ever use of long-acting contraceptives and training on methods of family planning were associated with utilization of long-acting reversible contraceptives in bivariate analysis. Finally, age, age at first sexual intercourse, the desired number of children, knowledge about LARCs, and training on family planning methods were significantly associated with the utilization of long-acting reversible contraceptives.

Female healthcare providers with the age category of 25-34 years and 15-24 years were 2.407 [AOR=2.407; 95% CI: 1.240-4.672] and 2.105 [AOR=2.105; 95% CI: 0.668-6.632] times more likely use LARCs than that of 35-49 age category respectively. Respondents who had 5000 and more family monthly income were 2 times [AOR=2.005; 95% CI: 1.236-3.251] more likely to utilize LARCs than women with a monthly income of less than 5000. Those who started sexual intercourse at 18 and above years 60% [AOR=0.401; 95% CI: 0.219-0.734] are less likely to utilize LARCs than those who started first sexual intercourse before 18 years. Participants who want to have 0-2 children were 2 times [AOR=2.147; 95% CI: 1.249-3.693] more likely to utilize LARC than women who want to have 5 and more children. Those who had good knowledge about LARCs were 2 times [AOR= 2.320; 95% CI: 1.236-3.251] more likely to utilize LARCs than that female health care providers who had poor knowledge about long-acting reversible contraceptives. Female health care providers who had training on family planning methods were 3 times [AOR= 3.460; 95% CI: 1.203-4.589] more used long-acting reversible contraceptives than female health care providers who had no training on family planning methods (Table 4).

Table 4: Factors associated with long-acting reversible contraceptive utilization among female health care providers in Gamo and Gofa zone hospitals, SNNPR in 2021

Variable	Categories	Utilization of LARC		OR(95% confidence interval)		P-Value
		Yes	No	COR (95%CI)	AOR (95%CI)	
Age	15-24	8	46	0.318[0.485-1.370]	2.105[0.668-6.632]	0.204
	25-34	102	194	0.788[0.311-1.383]	2.407[1.240-4.672]	0.009*
	35-49	22	92	1		1
Monthly income	<5000	72	139	1		1
	>=5000	60	193	1.660[0.102-1.901]	2.005[1.236-3.251]	0.005*
Age at first sex	<18 years	32	127	1		1
	>= 18 years	100	205	0.510[0.128-1.062]	0.401[0.219-0.734]	0.003*
Knowledge about LARCs	Poor	33	65	1	1	
	Good	99	267	1.360[0.150-1.752]	2.320[1.326-3.512]	0.034*
Number of birth given	1-2	83	142	1	1	
	>=3	44	107	1.120[0.237-2.622]	0.650[0.079-3.619]	0.522
Desired number of children	0-2	8	23	0.650[0.340-1.160]	2.147[1.249-3.693]	0.006*
	3-4	80	120	0.716[0.298-1.210]	1.357[0.494-3.725]	0.554
	>=5	44	189	1	1	
Level of education	Level III	1	10	1	1	
	Diploma	83	183	1.239[0.390-2.000]	0.050[0.007-0.931]	0.129
	Degree & above	48	139	0.230[0.132-0.715]	0.948[0.515-1.746]	0.865
Number of the child alive	<=2	83	142	1	1	
	>2	44	107	1.424[0.037-1.921]	1.449[0.318-6.598]	0.632
Had ever used LARCs	Yes	124	145	19.990[14.310-23.700]	0.048[0.021-0.113]	0.570
	No	8	187	1	1	
Trained on FP	Yes	56	77	2.440[1.020-3.349]	3.460[0.203-0.589]	0.001*
	No	76	255	1	1	

*significantly associated variables with p-value <0.05

DISCUSSION

The study finding showed that the current utilization of LARCs was 28.5% at 95% CI (24.8%-32.5%) which is low. This finding was in line with the study done in Gojjam (22.7%) (8). The possible reasons for this could be due to fear of side effects, religious prohibition, and cultural beliefs. However, it was lower than the studies done in Gambia (43%) and Harar city (38%) [14,15]. But higher than the findings in Kenya (20.6%), Gondar town (20.4%), and Arba Minch town (13.1%) [13,16,17]. These discrepancies can be due to differences in the target population, sample size, study setting, and participant's knowledge.

Female health care providers who had 5000 and more monthly family incomes were 2 times more likely to utilize the LARCs than women who had less than 5000 families' monthly income. This finding was in line with the study conducted in Nepal [18]. The possible reason for this could be women with high economic status may have a wider opportunity for special training in family planning and media exposure. But it was the opposite with the finding in Gojjam [8]. This was reasoned as families with lower monthly income can't afford the costs of raising children; as a result, they may be forced to utilize long-acting contraceptives for effective and long-term pregnancy prevention. Those women who want to have 0-2 children were 2 times more likely to utilize the LARCs than women who want to have 5 and more children. This is supported by studies conducted in Gojam [8], Adama town [12], and Arsi Negele [19]. The possible reason for this might be women who wish to have more children tend to utilize short-acting contraceptives to satisfy their needs, while those who only require a few children can use LARCs to stop or extend their fertility. Female health care providers in the age group of 25-35 years were 2 times more likely to use LARCs than the age group of 35-49 years. This finding is consistent with the study conducted in Jinka town [20] and Nepal [18]. The possible justification for this could be women of younger age may have a desire to have children than older age women. Female health care providers who had good knowledge of LARCs were 2 times more likely to utilize them than that with poor knowledge of LARCs. This finding is supported by the study conducted in Adama town [12], Arba Minch town [13], and Jinka town [20]. This is the fact that female health care providers who had good knowledge of long-acting reversible contraceptives will avoid the misconception about LARCs and also understand their effectiveness and utilize it. Respondents who were trained in family planning were 3 times more likely to utilize LARCs than female health care providers who were not trained on family planning methods. This can be explained by those female health care providers who were trained on family planning methods may have detailed knowledge and this may affect their attitude to be supportive of LARCs and utilize them. Participants who started their first sexual intercourse at 18 years and above were 60% times less likely to utilize LARCs than those started who started their first sexual intercourse below 18 years. The relationship between age at first intercourse and utilization of LARCs needs further study. It is recommended that the local health planner should consider the modifiable factors from the study findings during planning. Also further studies should be done to dig other unexplored factors that were not included in the current study by mixing with qualitative study design.

The study's limitation was being a self-report, which could lead to bias. The strength of the study was the huge sample size, which was representative of the target population.

CONCLUSION

The study revealed that utilization of long-acting reversible contraceptives among female health care providers in Gamo and Gofa zone hospitals was low. Age 25-35 years, earning ≥5000 families monthly income, having good knowledge of LARCs, desire to have 0-2 children, being trained on family planning, and starting sexual intercourse ≥18 years were significantly associated with the utilization of long-acting reversible contraceptives. Providing training and intensifying information

dissemination on LARCs for female health care providers is essential.

Abbreviations

AOR: Adjusted Odds Ratio; CI: Confidence Interval; COR: Crude Odds Ratio; FP: Family Planning; IUCDs: Intrauterine Contraceptive Devices; LARCs: Long Acting Reversible Contraceptives; SSA: Sub Saharan Africa

DECELARATIONS

Competing interests

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

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Arba Minch Health Science College 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 of the article, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

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CESAREAN SECTION FOR A WOMAN WITH PARTIAL TRANSVERSE VAGINAL SEPTUM FIRST RECOGNIZED IN EARLY LABOR: CASE REPORT

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ABSTRACT

BACKGROUND: Transverse vaginal septum is among the rarest form of female genital tract anomaly that arise from faulty canalization of the urogenital sinus and mullerian ducts. The clinical presentation and time of diagnosis depends on whether the septum is perforated or not. Some women with partial transverse vaginal septum are asymptomatic until first diagnosed during pregnancy or in labor.

CASE PRESENTATION: This is a 19 years old primigravida lady, came with pushing down pain of 3 hours at 40+1 weeks. Her antenatal care follow up was uneventful. She had no dyspareunia. Up on pelvic examination there was transverse vaginal septum with 1cm central opening. She gave birth by cesarean section.

CONCLUSION: Cesarean section in early labor is a reasonable management option for women with thick transvers vaginal septum first recognized in early labor.

KEYWORDS: Transverse Vaginal Septum, Cesarean Section, Early Labor.

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INTRODUCTION

Transverse vaginal septum is among the rarest form of female genital tract anomaly that arise from faulty canalization of the urogenital sinus and mullerian ducts. They vary in their thickness and location in the vagina. It can be low if it lies at <3cm from the vaginal introits, middle if it measures 3-6cm from the vaginal introits, and high if it measures >6cm from the vaginal introits.[1] The transverse vaginal septum can also be classified as complete and partial. [2] Some women with partial transverse vaginal septum are asymptomatic until first diagnosed during pregnancy or in labor, this is mainly due to the flow of menstrual blood through small aperture.[3] The etiology is generally unknown, but there are some inherited cases were reported.[4] The exact incidence is not known, but reported as 1 in 30,000 to 1 in 80,000 women.[5] The ideal management of women with incomplete transverse vaginal septum that is first recognized during their first pregnancy or in labor is unclear, because of scarcity of the case to generate strong evidences. Generally there are three basic management options which include; incision of the septum during pregnancy, [6] elective cesarean section before the onset of labor or at the early stage of labor [7], and expectant management with a plan of either spontaneous dissection of the septum or incision late in labor.[8]

We reported a case of partial transverse vaginal septum first recognized in early labor and who gave birth by caesarean section. It emphasizes the need for caesarean section in women with transverse vaginal septum first recognized in early labor to avoid potential vaginal lacerations or obstruction to labor. Relevant literatures were also reviewed.

CASE PRESENTATION

This is a 19 years old primigravida lady whose first day of last normal menustral period (LNMP) was 20/12/12 Ethiopian calendar making her gestational age (GA) 40+1 weeks which was reliable, referred to Adama Hospital Medical College Labor and Delivery unit from the nearby health center after having pushing down pain of 3 hours duration. Her antenatal care (ANC) follow up was at the health center and it was uneventful. She had additional diagnosis of oligohydramnous made at the health center on the same day. Otherwise she had no leakage of liquor per vagina; she had no vaginal bleeding, no history of headache and blurring of vision. She had no personal or family history of diabetes mellitus, hypertension, and cardiac disease. The pregnancy was planned, wanted and supported. She was married one year back and she declined difficulty of sexual intercourse, but had painful menses with prolonged duration of flow. She had no family history of similar compliant.

Up on physical examination she was in labor pain with the vital signs of; blood pressure (BP) - 110/70 mmhg, pulse rate (PR) – 88 bpm, respiratory rate – 20 breath per minute, and the temperature was afebrile to touch. Pertinent physical finding was on Abdomen; Term size gravid uterus, longitudinal lie, Cephalic presentation, fetal heart beat (FHB) was 138 beats per minute, she had 3 uterine contractions in 10 minute each lasting 20 to 25 seconds. Up on genitourinary system (GUS) examination; there was no vaginal bleeding, external genitalia looks normal, manual separation of the vulva revealed blind pouched vagina, which shows thick, transverse dividing membrane with about 1 cm central opening, which lies approximately 2-3cm from the vaginal introits, per rectal examination was done to estimate the thickness of the septum which was approximately 1.5 to 2 cm thick. (figure -1). Since the central opening was narrow, it was difficult to appreciate the cervical status.

She was investigated with complete blood count (CBC) and her result was hemoglobin (Hgb) -10 gm/dl, white blood cell count (WBC) – 8100 /mm3, and Platelet count of – 285,000/mm3. Her blood group and Rh also showed B negative. Obstetric Ultrasound showed: Alive singleton intra-uterine pregnancy, cephalic presentation, estimated fetal weight of 3246gm, Amniotic fluid index (AFI) was 3.2cm, and no gross fetal congenital anomaly was seen.

With the assessment of; Primigravida + Full term pregnancy + Transverse vaginal septum in

Labor + RH negative with unknown sensitization +oligohydramnous, she was admitted to the labor ward. In the labor ward she was counseled for cesarean section as a mode of delivery and after informed consent was taken, cesarean section was done. The outcome being alive female neonate weighing 3400gm with APGAR score of 7 and 8 at 1st and 5th minute respectively. Intraoperatively the Uterus, both tubes and ovaries looks normal; Both kidney and ureters were also visualized and looks normal. She had smooth postpartum course and discharged on her 3rd postoperative day. She had appointment on her 6th postpartum day, and 6th postpartum week, had no new development. She was given an appointment for elective septum resection.

DISCUSSION

A congenital separation within the vagina results in vaginal septum; which can be longitudinal or transverse vaginal septum.[5] Longitudinal vaginal septum causes double vagina as a result of incomplete fusion of the two lower mullerian ducts during embryogenesis [9].Transverse vaginal septum is among the rarest form of female genital tract anomaly that arise from faulty canalization of the urogenital sinus and mullerian ducts.[1] A transverse septum is commonly seen between the upper one-third and lower two-thirds of the vaginal canal.[10] The etiology is generally unknown, but there are some inherited cases were reported. The mode of inheritance was reported as sex linked autosomal recessive.[4] The exact incidence is not known, but reported as 1 in 30,000 to 1 in 80,000 women.[5]

Transverse vaginal septum varies in their thickness and location in the vagina. Based on distance between vaginal introits and distal part of septum, septum can be low if it measures <3cm from the vaginal introits, middle if it measures 3-6cm from the vaginal introits ,and high if it measures >6cm from the vaginal introits.[1] The most common location of transverse vaginal septum is the upper vagina which accounts 45 % of transverse vaginal septum. The remaining 40% occurs in the in the mid-portion of the vagina and 15% occurs in the lower part of the vagina.[1, 11] Upper transverse vaginal septum is likely to be patent, whereas the lower transverse vaginal septum is more often complete.[1]

The transverse vaginal septum can also be classified as complete and partial or incomplete. [2] Septum can be perforate or imperforate. Imperforate (complete) septum may presentin children with mucocolpos (accumulation of mucus within the vagina) and in adolescent it may present with obstructed menstrual flow resulting in haematocolpos (accumulation of blood within the vagina). Since the perforation allows the passage of menstrual blood, a woman with a perforate septum often has normal menses and usually they may present with difficulties in intercourse.[2, 9, 12] Some women with partial transverse vaginal septum are asymptomatic until first diagnosed during pregnancy or in labor, this is mainly due to the flow of menstrual blood through small aperture.[3] In this case she was married and having regular sexual intercourse for the past 1 year. She had no difficulty of sexual intercourse. She had regular menses with occasional pain and prolonged menstrual flow. She had no family history of similar compliant. She presented with pushing down pain of 3 hours duration and up on pelvic examination there was a 1.5 to 2 cm thick transverse dividing membrane which lies about 2- 3cm from the vaginal introits having a 1cm central opening.

The ideal management of women with incomplete transverse vaginal septum that is first recognized during their first pregnancy or in labor is unclear, because of scarcity of the case to generate strong evidences. Most of the evidences come from case reports, case series and expert opinions. Generally there are three basic management options for transverse vaginal septum first recognized during the first pregnancy, this includes; incision of the septum during pregnancy (before the onset of labor),[6] and elective cesarean section before the onset of labor or cesarean section at the early stage of labor to avoid potential vaginal lacerations or obstruction to labor.[7] The last option being expectant management which means allowing progress of labor with a plan of either spontaneous dissection of the septum as a result of dilation of the cervix and descent of the

fetal head, or incision late in labor, if needed, after the septum has thinned and pressure from the head can provide hemostasis.[8]

If not identified until advanced labor, a transverse vaginal septum may result in significant vaginal laceration or obstructed labor that may results in a ruptured uterus. There was a case of obstructed labor resulted from a transverse vaginal septum for which cesarean section was done, this case had also septum incision at menarche but it persisted into pregnancy.[13] On the other hand there are two cases of transverse vaginal septum that gave birth vaginally were reported in the literature; those cases presented with uncorrected transverse vaginal septum that was managed in active labor by resection of the septum. Both patients sustained some degree of lacerations over the vagina. The authors stated that resection or incision during labor resulted in acceptable outcomes in the management of transverse vaginal septum.[3]

In one case series, 36 pregnancies in women with transverse vaginal septum were reported and found that; one-half had planned cesarean delivery, most of the rest had incision or instrumental dilation during labor, and a few underwent incision before pregnancy.[2] Since it was rare to diagnose transverse vaginal septum in labor for the first time, the reviewed literature stated that the cesarean section in early labor appears to be a reasonable option. We report a case of low transverse vaginal septum first recognized in labor for which caesarean section was done. Because it was difficult to follow the progress of labor, to diagnose labor abnormalities and cephalo-pelvic disproportion in such women, cesarean section in early labor is acceptable management option.

CONCLUSION

Following the progress of labor through periodic cervical evaluation is an important parameters to pick labor abnormalities and for earlier detection of sign of cephalo-pelvic disproportion (CPD). In a woman with transverse vaginal septum this is not possible, so cesarean section in early labor is a reasonable management option in order to avoid potential vaginal lacerations or obstructed labor.

List of Abbreviations

AHMC- Adama Hospital Medical College; ANC – Antenatal Care; AFI – Amniotic Fluid Index; CPD - Cephalo-Pelvic Disproportion; LNMP- Last Normal Menstrual Period.

Declarations

Ethics approval

Ethical clearance was taken from the Institutional Ethics Review Board of Adama Hospital Medical College.

Consent for publication

For the publication of this case report and accompanying images, written informed consent was obtained from the patient.

Availability of data

If needed, data used in this case report can be obtained from the corresponding author.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

The conception of the case report was made by the corresponding author. The management and follow up of the patient was under taken by DT, GA, and AM. In the preparation of the document all authors were involved in the literature review and critically reviewing the article.

The final approval of the submitted document was given by all authors after reading the document and has agreed to be published on the journal. All authors agreed to take responsibility and be accountable for the contents of the article.

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Figure Legends

Figure 1 - Low partial Transverse Vaginal Septum first recognized in early labor

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