Determinants of Utero-vaginal prolapse in Western Ethiopia

Gamachis Firdisa
Metu University

Temesgen Tilahun
Wollega University

Gemechu Kejela (✉ gemechukejela86@gmail.com)

Abstract

Background: Uterovaginal prolapse is a significant public health concern in developing countries like Ethiopia where access to health care is limited. It significantly affects women's health and productivity. Thus, it is very important to identify determinant factors and take preventive actions.

Methods: A hospital-based unmatched case-control study was conducted on 86 cases and 258 controls who attended gynecologic outpatient departments in Nekemte town, from May 1 to July 30/2019. Cases were women with grade II, III & IV uterovaginal prolapse while controls were women free from uterovaginal prolapse but with other gynecologic diseases. Data were collected using pretested interviewer-administered structured questionnaires and measurements on height and weight were taken to calculate the body mass index of women. Data were entered using Epi Data version 3.1 and analysis was carried out by SPSS version 24.0. Descriptive, bivariate, and multivariable logistic regressions were performed. The adjusted odds ratio with a 95% confidence interval was used and statistical significance was declared at p<0.05.

Results: This study revealed, age ≥40 years (AOR=10.49; 95%CI: 4.03, 27.35), duration of labor ≥24 hours (AOR=8.32; 95%CI: 3.58, 19.33), instrumental delivery (AOR=7.40; 95%CI: 1.21, 45.28), non-utilization of family planning (AOR=3.14; 95%CI: 1.32, 7.47) and underweight (BMI <18.5 kg/m^2) 5.30 (AOR=5.30; 95%CI: 1.83, 15.33) were determinants of utero vaginal prolapse.

Conclusion: Age ≥ 40 years, prolonged labor, instrumental delivery, non-utilization of family planning, and underweight were identified as determinant factors of uterovaginal prolapse. Thus, family planning service utilization and appropriate and timely obstetric care are advisable.

Background

Utero vaginal prolapse (UVP) is the descent of the uterus through the vaginal canal due to defects in the support structures of the uterus and vagina because of different factors. It is manifested by protruding mass per vagina, urinary, and rectal complaints [1,2].

Utero vaginal prolapse is a common pelvic floor disorder among women of reproductive age and postmenopausal women. It occurs both in developed and developing countries with an overall global prevalence of 2-20%. For instance, it is 3.4% in Nigeria, 20.4% in the united kingdom, 14% in the united states of America, and 27.1% in Turkey [3-6].

In Ethiopia, gynecological problems are important health problems affecting maternal health outcomes and women's productivity. In Ethiopia study done in Jimma and St. Paul's millennium medical college hospitals have revealed that Pelvic Organ Prolapse (POP) accounted for 40.7% and 15% of all gynecologic surgeries respectively [7, 8].

Though pelvic organ prolapse is not a life-threatening condition, it has significant effects on socioeconomic status, woman psychology, health, sexual function, and overall quality of life [9-12].

A review of the literature around the world revealed different factors for the development of uterovaginal prolapse. The most important once are factors that increase intra-abdominal pressure, difficult labor and delivery, malnutrition, old age, connective tissue disorders, heavy exercise, and pelvic trauma [7, 13-29].

But what factors lead to the occurrence of UVP are not well studied in Ethiopia. There are only a few studies in the country that relied on patient records which might be subjected to information bias due to incompleteness and poor quality of secondary data (7, 8). Also, to the best of the authors' knowledge, there was no study on determinants of utero-vaginal prolapse in Western Ethiopia. Thus, the current study assessed the determinant factors of UVP in Western Ethiopia using primary data.

Methods

Study Area and Period

A hospital-based unmatched case-control study was conducted among women attending gynecologic Out Patient Department (OPD) in Nekemte town, from May 1 to July 30/2019. Nekemte town, the capital city of East Wollega zone is found at 331 km west of Addis Ababa. According to the 2018 Nekemte town health Office report, the total population of Nekemte town was 127,380 of which 51.03%, 49.97%, 16.4%, and 3.47% comprised of male, female, under-five children and pregnant women respectively. The dominant ethnic group is Oromo. There are two public hospitals in the town namely Nekemte specialized hospital and Wollega University referral hospital. These hospitals give services including Obstetric and gynecologic services to nearly 5 million people in western Ethiopia and adjacent areas. They have well-organized gynecology and obstetrics departments which are led by 7 gynecologists and 15 general practitioners. These two hospitals provide uterovaginal prolapse and other surgical interventions.

Source Population

All women attending gynecologic OPD at public hospitals in Nekemte town were the source population.

Study population

All women attending gynecologic OPD at public hospitals in Nekemte town during the study period. Cases were women with grade II, III & IV uterovaginal prolapse. Controls were those women free from uterovaginal prolapse but with some other gynecologic disease during the same study period. All women aged more than 18 years attending OPD during the study period were included in the study. However, women with grade I UVP, women with a total abdominal hysterectomy and vaginal hysterectomy, critically ill women, and women with mental problems were excluded from the study.

Sample Size Determination and sampling procedure

The sample size was calculated using Epi-info software version 7 using sample size determination for unmatched case-control studies. The parameters that were used to calculate sample size were; Confidence level 95%, power 80%, control to case ratio of 3: 1, the proportion of controls with exposure 6.2%, the proportion of cases with exposure 18.5%, and Odd Ratio of 3.1. It was calculated from the study conducted in Bahir Dar town, North West Ethiopia by taking BMI (< 18.5 kg/m^2) as one of the main exposure variables for pelvic organ prolapse that provide the maximum sample size [13]. Therefore, it yields 78 cases and 232 controls. Adding a 10% non-response rate, the final sample size becomes 341 (86 cases and 258 controls).

Two hospitals in Nekemte town were included because they were providing surgical intervention for cases of UVP. Then based on the number of clients who visited the gynecologic OPD of these two hospitals during the previous three months (60 cases and 358 controls for Wollega University Referral hospital, and 45 cases and 308 controls for Nekemte specialized hospital), the sample size was proportionally allocated to each hospital. Finally, cases in the two hospitals were included consecutively and three controls for each case were selected using a systematic sampling method.

Measurements

Uterovaginal prolapse is defined as the descent of either of the uterus, cervix, vagina or associated structures such as bladder and rectum(1). Inter-pregnancy interval was defined as the interval between the most recent previous childbirth and the starting time of pregnancy for the current child as reported by the mother at the time of the interview. In this study, the women faced labor-intensive work if she reported frequent engagement to works like lifting and carrying heavy objects. Chronic cough is defined as a cough that lasts two months or more. Chronic constipation is defined as a stool frequency of less than three per week that lasts several months or having difficulty passing stools. In this study, abortion is defined as either spontaneous or induced termination of pregnancy before fetal viability (before 28 weeks of gestational age according to Ethiopian context).

Data Collection Tools and Procedures

Data on socio-demographic, obstetric, gynecologic, and medical history were collected by using a pre-tested structured interviewer-administered questionnaire which was developed by reviewing different literatures [13, 27, 30, 31,32]. Four BSc nurses and two MSc supervisors were recruited and trained for data collection. All questionnaires were checked for completeness daily by the supervisors.

Physical measurement was used to obtain data on the weight and height of women. In this regard, the weight of each woman was measured using a balanced beam in kg nearest to 0.1kg and height was measured using a measuring tape to the nearest 0.1cm. To diagnose uterovaginal prolapse,

gynecologists working in Out Patient Department were used. Pelvic examination was done after a woman had emptied her bladder. The examination was done in a lithotomy position. To avoid intra-rater and inter-rater reliability, the authors had a thorough discussion with attending gynecologists on finding documentation.

Shaw's classification system of uterovaginal prolapse was used for grading of the disease. In this classification system, the descent is classified into four grades; the first grade is the descent of the cervix into the vagina, second grade is the descent of the cervix into the introitus, third grade is the descent of the cervix outside the introitus, and the fourth grade is when the whole of the uterus is outside introitus [1].

Data Quality Assurance

The questionnaire was first prepared in English and then translated to the local language (Afan Oromo). The data collectors and supervisors were trained for two days on data collection and details of the study. A pretest was conducted on 4 cases and 12 controls at Mettu Karl Hospital which is located in southwest Ethiopia.

Data Processing and Analysis

After checking for completeness, data were entered using Epi Data version 3.1. It was then cleaned and exported to SPSS Version 20 for analysis. Frequency distribution and percentage were used to describe predictor variables. Also, descriptive statistics including mean and standard deviation were conducted to describe continuous variables. Bivariate analysis was used to examine the association between dependent and independent variables; Odds Ratios (ORs) and their 95% Confidence Intervals (CIs) were calculated. All variables that had a P-value of < 0.2 in the bivariate analysis were included in the multivariate logistic regression analysis model to identify determinant factors of uterovaginal prolapse. Statistical significance was set at a p-value of < 0.05. In the model development process, the existence of multi-collinearity was assessed to rule out the interaction among independent variables using the variance inflation factor (VIF). Accordingly, the result of VIF was close to one which showed minimal collinearity. The model was assessed for the goodness of fit using the Hosmer-Lemeshow test. Since the p-value for the Hosmer-Lemeshow chi-square was greater than 0.05(P=0.965), the model estimate was adequate to fit the data at an acceptable level.

Result

Socio-Demographic Characteristics of study participants

Out of the total sample size, 325 respondents (82 cases and 243 controls) participated in the interview with the response rate of 95.3%. The mean age of study participants was 34.9 years with mean and SD of ±10.5 (45.9(±10.4 SD) years for cases and 31.2(±7.6 SD) years for controls. The proportion of older age women (age ≥ 40) was found to be higher among cases (65.9%) compared to controls (8.6%)

(p=0.001). The majority of study participants, both in cases and controls, were Oromo by ethnicity, protestant in religion, and married. Forty seven (57.3%) of cases and 122(50.2%) of controls had no formal education (p=0.01). More than half of participants among cases 47(57.3%) and controls 140(57.6%) were housewives (p=0.022). From a total of women involved, 54(65.9%) of cases and, 135(55.6%) of controls were rural residents (Table 1).

Obstetrics Characteristics of study participants

From the total study participants, 57(70.4%) of cases and, 180(75.6%) of controls were married at the age of eighteen and above (p=0.043). Greater than three-fourths of cases 66(81.5%) and nearly half 108(47.6%) of controls had pregnancy experience great or equal to four (p=0.001). Forty nine (62.8%) of cases and 111(56.6%) of controls had an average inter-pregnancy interval of ≤2 years. Fifty one (63%) of cases and 62(27.3%) of controls had no ANC follow up for the last pregnancy (p=0.001). The larger proportion of cases 58(71.6%) and controls 151(66.5%) did labor-intensive work during the last pregnancy (p=0.001). Sixty (74.1%) of cases and 78(35.6%) of controls had ≥4 total number of delivery (0.001). Forty-two (51.9%) of cases and 34(15.5%) controls gave birth at home (0.001). The majority of cases (80.2%) and (86.8%) of controls gave birth vaginally to the last baby (p=0.022). The proportion of women who experienced vaginal tear during the last delivery were 7(8.6%) among cases and 14(6.4%) among controls (p=0.002) (Table2).

Fifty-four (66.7%) of cases and fifty-five (25.1%) of controls stayed in labor for great or equal to 24 hours during the last childbirth. However, 28 (33.30%) of cases and 188 (74.90%) of controls stayed in labor for less than 24 hours during the last childbirth (p=0.016).

Medical Problems among study participants

From study participants, 17(20.7%) of cases and 16(6.6%) of controls had a history of chronic cough (p=0.001). Thirty-six (43.9%) of cases and 40(16.5%) of controls had a history of carrying heavy objects (p=0.001). Among women involved in the study, 47(14.5%), 3(0.9%), 63(19.4%), 5(1.5%), 6(1.8%) had hypertension, diabetes mellitus and chronic constipation respectively (p=0.003, p=0.201, p=0.001). Regarding participants' BMI, 50(61.0%) of cases and 183(75.3%) of controls had BMI of 18.5-24.9 kg/m^2 (p=0.001) (Table 3).

Determinants of uterovaginal prolapse among study participants

The odds of developing UVP concerning different characteristics of women were estimated by odds ratio using binary logistic regression analysis. Variables having a p-value of less than 0.2 at bivariate analysis were taken to multivariable analysis. In the final model, the odds of having UVP across each independent variable were adjusted for confounding effects. Accordingly, age, duration of labor, mode of delivery, family planning use, family history of UVP, and low BMI were predictor variables that remained significantly associated with UVP at p-value less than 0.05.

Multivariable logistic regression analysis indicated that women aged ≥40 years had 10.5 times greater odds of experiencing uterovaginal prolapse compared to those aged <40 years (AOR=10.49; 95%CI: 4.03, 27.35). Women who had a duration of labor greater or equal to 24 hours during the last childbirth had 8.32 times higher odds of developing UVP compared to those who stayed less than 24 hours (AOR=8.32; 95%CI: 3.58, 19.33). Women who gave birth by instrumental delivery had 7.40 times higher odds of developing UVP compared to women who gave birth by cesarian section (AOR=7.40; 95%CI: 1.21, 45.28). Women who did not ever use family planning had 3.14 times higher odds of developing UVP compared to their counterparts (AOR=3.14; 95%CI: 1.32, 7.47). Similarly, women with a family history of UVP had 3.77 times higher odds of developing UVP compared to their counterparts (AOR=3.77; 95%CI: 1.10. 12.88). Also, underweight women had 5.3 times higher odds of developing UVP compared to women with normal weight (AOR=5.30; 95%CI: 1.83, 15.33).

However, the effect of residence, gravidity, parity, place of delivery, menopausal status, history of chronic cough, chronic constipation, and carrying heavy objects were no longer significant after adjusting for confounders (Table 4).

Discussion

The main objective of the study was to identify the determinant factors of UVP among women attending gynecologic OPD at public hospitals in Western Ethiopia. Accordingly, many modifiable factors were identified to affect the occurrence of UVP.

Different studies reported that the risk of UVP increases with age [7,13,15,26,28]. This study also revealed that women aged ≥40 years had 10.49 times higher odds of experiencing UVP compared to women aged <40 years. This might be due to age-related weakening of pelvic supportive structures, decreased level of estrogen, and high parity in this age group. However, a study conducted in Gondar Dabat district, Ethiopia, reported a contradictory finding [33].

The duration of labor great or equal to 24 hours was significantly associated with the development of uterovaginal prolapse. This finding is consistent with previous reports from India [25], Nepal [30], Tanzania[35], Nigeria [19], and Ethiopia [7]. This could be because prolonged labor causes more damage to supportive structures of the uterus and other pelvic organs. Prolonged labor can also be complicated by obstructed labor which might need aggressive interventions like operative deliveries that might worsen damage to already weakened structures.

Previous studies indicated a controversial association between instrumental deliveries and pelvic prolapse. A study in Greater Baltimore Medical Center in Towson has suggested that operative delivery(forceps or vacuum) substantially increases the odds for pelvic organ prolapse[36] while a population-based study in Sweden [37] failed to show this association. Interestingly, this study identified a significant association between instrumental delivery and UVP. Women who delivered either by forceps or vacuum had 7.4 times higher odds of developing UVP compared to women who delivered by cesarian

section. A possible explanation could be due to stretching and tearing as a result of excessive traction applied during difficult instrumental deliveries[31].

Women who did not use family planning had 3.14 times higher odds of developing UVP compared to their counterparts. This finding is similar to the study conducted at Wolaita Sodo University Referral Hospital [32]. This is because mothers who do not use family planning have repeated deliveries during which cumulative effects of pushing down pain might damage the pelvic support structures. However, a study conducted in England [3] did not show an association between the utilization of family planning and the development of UVP.

In this study, family history was found to be a predictor for UVP. Women with a family history of UVP had 3.77 times higher odds of developing UVP compared to their counterparts. This is consistent with studies conducted in Addis Ababa, Ethiopia [8], and Nepal [33]. Similarly, a study conducted in Italy reported that the risk of urogenital prolapse was higher in women with a family history of prolapse as compared to women without a family history of prolapse [17]. This could be due to the presence of congenital connective tissue disorders in these families.

Like a report from Bahir Dar, Ethiopia [13], underweight (BMI <18.5 kg/m^2) was also found to be a determinant of UVP in this study. This is due to the possibility of micronutrient deficiencies which are necessary for connective tissue strength. On the other hand, other studies showed that obesity (BMI ≥25 kg/m^2) is a risk factor for UVP [15, 23,30].

Limitations of this study include; small sample size that might lead to statistical imprecision; since participants were asked about some of their previous health-related events, it is subjected to recall bias; cases and controls were not matched by age, which might be an important contributor to the occurrence of UVP; and the possibility of errors in measuring exposure variables of interest which might impact the internal validity of the study.

CONCLUSIONS: Age ≥ 40 years, prolonged labor, instrumental delivery, non-utilization of family planning, family history of UVP, and underweight were identified as determinant factors of uterovaginal prolapse. Therefore, creating awareness for women regarding possible risk factors and preventive measures of uterovaginal prolapse, training for health professionals on how to manage prolonged labor and how to use instrumental delivery cautiously, and further study that utilize strong designs are recommended.

Declarations

Ethical Considerations

Ethical clearance was obtained from Wollega University Institute of Health Sciences Ethical Review Board. Additionally, a letter of cooperation was written to respective hospitals by Wollega University Institute of Health Sciences. To obtain permission, hospital administrations were informed before starting data collection. All participants were given adequate information regarding the purpose, risk and benefit,

and confidentiality of the study as described in the information sheet. Participation was fully voluntary and written informed consent was taken from each participant. Confidentiality of patient was kept and the information was merely used for this study.

Authors' contributions

GF, TT, and GK were involved in all components of this research, including conception, design, and supervision of data collection, data analysis and write up of the manuscript. All authors read and approved the final manuscript.

Availability of data and materials

The data sets used and analyzed for the current study are available from the corresponding author on reasonable request.

Consent for publication

Not applicable.

Competing interest

The authors declare that they have no competing interests.

Authors detail

[1]Department of Nursing, College of Medicine and Health Sciences, Mettu University, Mettu, Ethiopia. [2]School of Medicine, Institute of Health Sciences, Wollega University, Nekemte, Ethiopia. [3]Department of Public Health, Institute of Health Sciences, Wollega University, Nekemte, Ethiopia.

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Tables

Table 1: Socio demographic characteristics of women attending gynecologic OPD among cases and controls at public hospitals in Nekemte town, Western Ethiopia, 2019

Characteristics of Respondents	Cases Number (%)	Controls Number (%)	P-Value
Age			
≥40	54(65.9)	21(8.6)	0.001
<40	28(34.1)	222(91.4)	
Ethnicity			
Oromo	74(90.2)	225(92.6)	0.527
Amhara	7(8.5)	13(5.3)	
Other(Tigre, Guraghe)	1(1.2)	5(2.1)	
Religion			
Protestant	50(61.0)	150(61.7)	0.253
Orthodox	25(30.5)	55(22.6)	
Muslim	6(7.3)	35(14.4)	
Other(Catholic, Adventist)	1(1.2)	3(1.2)	
Education of Women			
No education	47(57.3)	122(50.2)	0.010
Primary(1-8 grade)	25(30.5)	76(31.3)	
Secondary(9-12 grade)	7(8.5)	35(14.4)	
College and above	3(3.7)	10(4.1)	
Occupation			
House wife	47(57.3)	140(57.6)	0.022
Merchant	10(12.2)	35(14.4)	
Government employee	2(2.4)	11((4.5)	
Daily laborer	3(3.7)	4((1.6)	
Farmer	20(24.4)	53(21.8)	
Marital Status			
Single(single, divorced, widowed)	3(3.7)	8(3.3)	0.081
Married	79(96.3)	235(96.7)	
Residence			
Urban	28(34.1)	108(44.4)	0.102
Rural	54(65.9)	135(55.6)	

Table 2: Obstetrics and gynecologic history of women attending gynecologic OPD among cases and controls at public hospitals in Nekemte town, Western Ethiopia, 2019

Characteristics	Cases	Controls	P-Value
	Number (%)	Number (%)	
Age at first marriage			
≥18 years	57(70.4)	180(75.6)	0.043
<18 years	24(29.6)	58(24.4)	
Age at first pregnancy			
<20 years	36(44.4)	112(49.3)	0.370
≥20 years	45(55.6)	115(50.7)	
Gravidity			
≥4	66(81.5)	108(47.6)	0.001
<4	15(18.5)	119(52.4)	
Inter-pregnancy interval			
≤2 years	49(62.8)	111(56.6)	0.348
>2 years	29(37.2)	85(43.4)	
History of abortion			
Yes	41(50.6)	105(46.3)	0.500
No	40(49.4)	122(53.7)	
ANC follow up			
Yes	30(37.0)	165(72.7)	0.001
No	51(63.0)	62(27.3)	
Labor intensive work			
Yes	58(71.6)	151(66.5)	0.001
No	23(28.4)	76(33.5)	
Ever gave child birth			
Yes	81(100.0)	219(96.5)	0.087
No	0(0.0)	8(3.5)	
Parity			
≥4	60(74.1)	78(35.6)	0.001
<4	21(25.9)	141(64.4)	
Number of vaginal deliveries			
≥4	59(72.8)	69(32.2)	0.001
<4	22(27.2)	145(67.8)	

Place of delivery (for the last child)			
Home	42(51.9)	34(15.5)	0.001
Health facility	39(48.1)	185(84.5)	
Mode of delivery (for the last child)			
Spontaneous vaginal delivery	65(80.2)	190(86.8)	0.022
Instrumental delivery	11(13.6)	10(4.6)	
Cesarean section	5(6.2)	19(8.7)	
Vaginal tear (during last child birth)			
Yes	7(8.6)	14(6.4)	0.002
No	74(91.4)	205(93.6)	
Sphincter damage (during the last child birth)			
Yes	2(2.5)	2(0.9)	0.007
No	79(97.5)	217(99.1)	
Episiotomy (during the last child birth)			
Yes	5(6.2)	18(8.2)	0.017
No	76(93.8)	201(91.8)	
Duration of rest after delivery (for the last child)			
≤42 days	59(72.8)	168(76.7)	0.016
>42 days	22(27.2)	51(23.3	
Ever used family planning			
Yes	16(19.5)	129(53.1)	0.001
No	66(80.5)	114(46.9)	
Menopausal status			
Premenopausal	33(40.5)	222(91.4)	0.001
Postmenopausal	49(59.5)	21(8.6)	
Family history of UVP			
Yes	17(20.7)	13(5.3)	0.001
No	65(79.3)	230(94.7)	

Table 3: Medical problems and history of pelvic surgery among cases and controls at public hospitals in Nekemte town, Western Ethiopia, 2019

Variables	Cases	Controls	P-Value
	Number (%)	Number (%)	
History of chronic cough			
Yes	17(20.7)	16(6.6)	0.001
No	65(79.3)	227(93.4)	
Hypertension			
Yes	13(15.9)	34(14.0)	0.003
No	69(84.1)	209(86.0)	
Diabetic mellitus			
Yes	1(1.2)	2(0.8)	0.201
No	81(98.8)	241(99.2)	
Chronic constipation			
Yes	30(36.6)	33(13.6)	0.001
No	52(63.4)	210(86.4)	
Ever smoke cigarette			
Yes	3(3.7)	4(1.6)	0.278
No	79(96.3)	239(98.4)	
Carry heavy objects			
Yes	36(43.9)	40(16.5)	0.001
No	46(56.1)	203(83.5)	
Previous prolapse surgery			
Yes	4(4.9)	2(0.8)	0.018
No	78(95.1)	241(99.2)	
BMI			
18.5-24.9 kg/m^2	50(61.0)	183(75.3)	0.001
<18.5 kg/m^2	27(32.9)	18(7.4)	
≥25 kg/m^2	5(6.1)	42(17.3)	

Table 4: Bivariate and multivariable logistic analysis of determinants of utero-vaginal prolapse among women attending gynecologic OPD at public hospitals in Nekemte town, Ethiopia, 2019

Variables	Cases N (%)	Controls N (%)	Crude OR(95%CI)	Adjusted OR(95%CI)
Age				
≥40	54(65.9)	21(8.6)	20.39(10.76, 38.63)	10.49(4.03,27.35)*
<40	28(34.1)	222(91.4)	1	1
Residence				
Urban	28(34.1)	108(44.4)	1	
Rural	54(65.9)	135(55.6)	1.54(0.92,2.60)	0.59(0.25,1.39)
Gravidity				
≥4	66(81.5)	108(47.6)	4.85(2.61,8.99)	1.29(0.32,5.26)
<4	15(18.5)	119(52.4)	1	1
Parity				
≥4	60(74.1)	78(35.6)	5.17(2.93,9.12)	2.12(0.88,5.04)
<4	21(25.9)	141(64.4)	1	1
Place of delivery (for the last child)				
Home	42(51.9)	34(15.5)	5.86(3.31,10.35)	1.43(0.49,4.11)
Health facility	39(48.1)	185(84.5)	1	1
Duration of labor (for the last child)				
≥24 hours	54(66.7)	55(25.1)	5.96(3.43,10.38)	8.32(3.58,19.33)*
<24 hours	27(33.3)	164(74.9)	1	1
Mode of delivery (for the last child)				
SVD	65(80.2)	190(86.8)	1.30(0.47,3.62)	1.11(0.25,4.90)
Instrumental delivery	11(13.6)	10(4.6)	4.18(1.13,15.42)	7.40(1.21,45.28)*
Cesarean section	5(6.2)	19(8.7)	1	1
Ever used family planning				
Yes	16(19.5)	129(53.1)	1	1
No	66(80.5)	114(46.9)	4.67(2.56,8.52)	3.14(1.32,7.47)*
Menopausal status				
Premenopausal	33(40.5)	222(91.4)	1	1
Postmenopausal	49(59.5)	21(8.6)	15.69(8.29.43)	1.77(0.44,7.17)
Family history of UVP				
Yes	17(20.7)	13(5.3)	4.63(2.14,10.02)	3.77(1.10,12.88)*

No	65(79.3)	230(94.7)	1	1
History of chronic cough				
Yes	17(20.7)	16(6.6)	3.71(1.78,7.75)	1.97(0.56,6.72)
No	65(79.3)	227(93.4)	1	1
Chronic constipation				
Yes	30(36.6)	33(13.6)	3.67(2.06,6.56)	1.92(0.78,4.74)
No	52(63.4)	210(86.4)	1	1
Carry heavy objects				
Yes	36(43.9)	40(16.5)	3.97(2.29,6.90)	1.94(0.82,4.60)
No	46(56.1)	203(83.5)	1	1
BMI				
18.5-24.9 kg/m^2	50(61.0)	183(75.3)	1	1
<18.5 kg/m^2	27(32.9)	18(7.4)	5.49(2.80,10.77)	5.30(1.83,15.33)*
≥25 kg/m^2	5(6.1)	42(17.3)	0.44(0.16,1.16)	0.40(0.10,1.51)

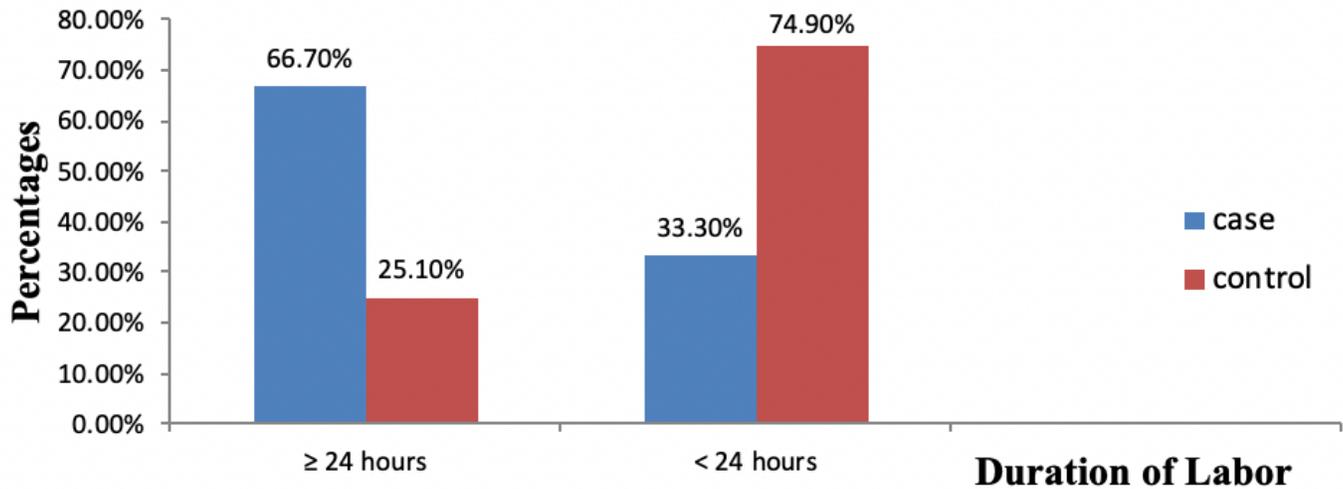Note: represents statistical significance at p<0.05

Figures

Figure 1

Duration of labor during last childbirth among cases and controls at public hospitals in Nekemte town, Western Ethiopia, 2019