

**ADDIS ABAAB UNIVERSITY**  
**COLLEGE OF HEALTH SCIENCES, SCHOOL OF MEDICINE,**  
**DEPARTMENT OF OBSTETRICS AND GYNECOLOGY POST**  
**GRADUATE PROGRAM**



**Prevalence of Anal Incontinence Six Weeks After Vaginal Delivery: Prospective study in the three teaching hospitals in Addis Ababa, Ethiopia**

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**THESIS TO BE SUBMITTED TO THE DEPARTMENT OF OBSTETRICS AND GYNECOLOGY, ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT FOR THE REQUIREMENTS OF SPECIALIZATION CERTIFICATE IN OBSTETRICS AND GYNECOLOGY**

**July, 2021**

## **ACKNOWLEDGEMENT**

I would like to express my gratitude to department of Gynecology and Obstetrics, Addis Ababa University College of Health Science, for giving me the opportunity to undertake this research as part of partial fulfillment for specialization in Gynecology and Obstetrics.

I am profoundly indebted to my advisors, Dr. Eyasu Mesfin and Dr. Kiflom Tesfaye, who were very supportive during the proposal development process and until the end of this thesis.

## **Abbreviation and Acronyms**

AA	Addis Ababa
AAU	Addis Ababa University
ABD:	Assisted Breech Delivery
BLH	Black Lion Hospital
CHS	College of Health Science
CRADIC	Colorectal-Anal Distress Inventory
DVD:	Destructive Vaginal Delivery
ICIQ-UI-SF	International Consultation on Incontinence Questionnaire on Urinary Incontinence–Short Form
DRPC	Department Research Proposal Committee
EPDS	Edinburgh Postpartum Depression Scale
GMH	Gandhi Memorial Hospital
OASIS	Obstetric anal Sphincter Injury
PI	Principal investigator
SSOL	Second stage of labor
SVD	Spontaneous Vaginal Delivery
ZMH	Zewditu Memorial Hospital

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## **Abstract**

**Background:** Anal incontinence, defined as the involuntary loss of fecal material or flatus once in a week or more. It ranges in severity from an occasional involuntary leakage of stool or flatus to a complete loss of bowel control. The overall prevalence in the population is reported to be approximately 8.3%. It is associated with reduced quality of life, negative psychogenic effects, and social stigma, yet many women do not report their symptoms or seek treatment. For childbearing women Obstetric anal sphincter injury (OASIS) is a well-known risk factor for AI. However, only half the cases of AI after childbirth can be attributed to OASIS. The other half may in part be caused by clinically unrecognized sphincter injury visible on ultrasound (occult OASIS) or by chronic pudenda neuropathy.

Because the long-term success of primary sphincter repair in resolving anal incontinence is reported to be as low as 44%, it is important for health care providers to reduce trauma to the perineum during the second stage of labor to avoid anal sphincter damage. In addition, postpartum care and follow up should not overlook detection and treatment of anal incontinence.

**Statement of the problem:**The overall prevalence of anal incontinence in childbearing women ranges from 7% to 15% according to some literatures. Less than 3% of women who do self-report fecal incontinence will have this diagnosis recorded in their medical record. But the real figure of the problem in our population is unknown. The most common risk factor is OASIS which occurs during child birth. Despite the anticipated magnitude of this public health problem, there is limited data on the prevalence of AI after childbirth in our country.

**Rationale of the study:**Obstetrician–gynecologists are in a unique position to identify women with anal incontinence because pregnancy, childbirth, obstetric anal sphincter injuries (OASIS), and pelvic floor dysfunction are important risk factors that contribute to anal incontinence in women. Thus, this study is meant to identify the magnitude of AI, associated factors and increase our diagnosis of AI and suggest possible interventions to prevent the condition.

**Objectives:** To Assess Prevalence of Anal Incontinence after vaginal delivery at 6weeks postpartum in three selected teaching hospitals (BLH, GMH and ZMH) in Addis Ababa, Ethiopia, 2021.

**Methods:** A prospective cross sectional study was done to assess the prevalence of anal incontinence after 6 weeks of vaginal delivery. The study participants will be those women who gave birth through vaginal delivery. Sample sizes of 384 women were studied. The data were collected through questionnaire developed using International Consultation on Incontinence Questionnaire on Urinary Incontinence –Short Form (ICIQ-UI-SF) and risks factors associated with anal incontinence mentioned in different literatures, immediately after delivery and 6 weeks later. After data collection, each questionnaire was checked for completeness based on the code given during data collection. Data were entered in to SPSS version 20.5 statistical package. Descriptive statistics like frequency, tables, graphs and descriptive summaries were used to describe the independent variables. The association of anal with independent variables is analyzed individually by binary logistic analysis and final association between dependent and independent variable is analyzed by multiple regression analysis.

**Result:**The prevalence of anal incontinence at 6 weeks of vaginal delivery was 8.6%. According to bivariate analysis result, fetal presentation (vertex}, mode of delivery (forceps), duration of second stage of labor (>120minutes), perineal tear were significantly associated with AI. After controlling the effect of confounding factors (variables), multiple logistic regression analysis revealed that perineal tear is significantly associated with AI (AOR = 7.641; 95% CI (1.443, 40.453)P=0.17, and those mothers had second degree of perinatal tear with (AOR =5.344; CI (1.144, 25.635) P=0.36, had significant association with AI.

**Conclusion and recommendation:**The prevalence of AI at 6 weeks of vaginal delivery was 8.6%. Perineal tear was significantly associated with AI, especially with increasing degree of perineal tear. Thus, it is important to prevent perineal tear. In addition, creating awareness about AI and making integral part of postpartum follow is necessary.

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# 1. INTRODUCTION

## 1.1. Background

Anal incontinence (AI), defined as the involuntary loss of fecal material or flatus, ranges in severity from an occasional leakage of stool while passing gas to a complete loss of bowel control. The overall prevalence in the population is reported to be approximately 8.3 % (1). Fecal incontinence, or the involuntary leakage of solid or loose stool, is estimated to affect 7–15% of community dwelling women. Altered fecal continence has been reported in as many as 25% of primiparous women at 6 weeks postpartum (2). Because of embarrassment and the reluctance to seek medical help, the prevalence of anal incontinence is underestimated and the real figures are unknown. Less than 3% of women who do self-report fecal incontinence will have this diagnosis recorded in their medical record (1).

It is associated with reduced quality of life, negative psychogenic effects (3, 4), social stigma, and may result in significant physical and emotional distress, including depression, loss of self-esteem, and social isolation, anxiety and mortality, yet many women do not report their symptoms or seek treatment. The etiology of fecal incontinence is broad and typically divided into neurologic and non-neurologic causes. The most common presentations among women are non-neurologic, particularly fecal incontinence after obstetric anal sphincter injuries (OASIS) (3), which may occur remote from delivery. Other common risk factors associated with anal incontinence include female sex, disease or injury causing damage to the nerves and/or muscles controlling the anal sphincter, chronic illness such as diabetes mellitus and depression, obesity, and sedentary lifestyle. For childbearing women, OASIS is a well-known risk factor for AI (3). The severity of AI has previously been related to the degree of OASIS, that is, dependent on the involvement of the external and internal sphincter and whether the rectal mucosa has been affected (1, 4). However, only half the cases of AI after childbirth can be attributed to OASIS. The other half may in part be caused by clinically unrecognized sphincter injury visible on ultrasound (occult OASIS) or by chronic

puddental neuropathy and contribute to postpartum fecal incontinence. In observational studies, occult anal sphincter lacerations have been detected with endoanal ultrasound in large numbers in women after spontaneous (9 to 36 percent), vacuum (0 to 21 percent), and forceps deliveries (80 to 83 percent (5, 6). There are also a number of tests are available to help pinpoint the cause of fecal incontinence such as Balloon expulsion test, Analmanometry and Proctography.

Anal incontinence is a major concern after delivery with OASIS and occurs in approximately 50% of cases at long-term follow-up (3, 7, and 8). Operative vaginal delivery is associated with increased risk of anal sphincter injury (9, 10). Forceps increased the risk of fourth degree perineal tears compared with vacuum (11). In addition, it is also associated with vaginal births, genital-tract tears/lacerations, extended episiotomy, prolonged labor, macrosomia, and dystocia. Asian origin, short ano-vulvar distance, ligamentous, hyper laxity, lack of expulsion control, non-visualization of the perineum or maneuvers for shoulder dystocia also appears to be risk factors (12). Although cesarean delivery is said to be protective, recent studies have demonstrated that it is not totally so (13, 14).

Recurrence- In a 2016 meta-analysis of eight studies including over 99,000 women, OASIS occurred in 6.3 percent of women with a prior obstetric anal sphincter injury. Women with two prior OASIS, had a 10-fold increased risk of OASIS in the third pregnancy, based on one study of over 13,000 women. Risk factors for recurrent anal sphincter injury included prior third- or fourth-degree obstetric laceration, operative vaginal delivery, median episiotomy, large-for-gestational-age neonates, and shoulder dystocia.

Although the risk factors are multifactorial, episiotomy is a modifiable risk factor for anal sphincter injury. Because the long-term success of primary sphincter repair in resolving anal incontinence is reported to be as low as 44%, it is important for health care providers to reduce trauma to the perineum during the second stage of labor to avoid anal sphincter damage. Experience of the birth attendant is a protective factor (12). Secondary prevention is based on the training of birth professionals in recognition and repair of OASIs. Primary prevention of OASIs is based on training in the maneuvers of the second phase of labor; if possible, instrumental extractions should be avoided. Mediolateral episiotomy may have a preventive role in high- risk OASIs deliveries (16).

Based on the cause of anal incontinence, the treatment can be medication, exercise therapy, Lifestyle modification, home remedy or surgery.

## **1.2 Statement of the problem**

The overall prevalence of anal incontinence in childbearing women ranges from 7% to 15% according to some literatures. Less than 3% of women who do self-report fecal incontinence will have this diagnosis recorded in their medical record. But the real figure of the problem in our population is unknown. The most common risk factor is OASIS which occurs during child birth. Despite the anticipated magnitude of this public health problem, there is limited data on the prevalence of AI after childbirth in our country.

## **1.3. Rationale of study**

The anticipated magnitude of anal incontinence in child bearing women is significant. Because of embarrassment and the reluctance to seek medical help, the prevalence of anal incontinence is underestimated and the real figures are unknown. Health care providers dealing with maternal care and delivery, in particular Obstetrician–gynecologists are in a unique position to identify women with anal incontinence because pregnancy, childbirth, obstetric anal sphincter injuries (OASIS), and pelvic floor dysfunction are important risk factors that contribute to fecal incontinence in women. Thus, this study is meant to identify the magnitude of AI, associated factors, increase our diagnosis of the condition and suggest possible preventive measures.

## **2. LITRATURE REVIEW**

### **2.1. Summary**

Anal incontinence, defined as the involuntary loss of fecal material or flatus, ranges in severity from an occasional leakage of stool while passing gas to a complete loss of bowel control. The overall prevalence in the population is

reported to be approximately 8.3% (10). For childbearing women, anal sphincter injury sustained during vaginal birth is considered to be one of the primary predisposing factors for anal incontinence. AI is associated with associated significant reduction in quality of life.

A study done on Postpartum psychological distress associated with anal incontinence shows Women who reported anal incontinence at 4 months were more frequently depressed (EPDS  $\geq 10$  or antidepressant use) at 12 months postpartum: 36.0% of those with faecal incontinence were depressed, 23.3% of those with flatus-only incontinence, and only 14.8% of the continent women (4).

According to study done in Nigeria in 2015, the cumulative prevalence rate was 13.5 % for anal incontinence and 3 % for combined urinary and anal incontinence. Age, social class, parity, prolonged second stage of labor, and neonatal birth weight were significantly associated with postpartum urinary incontinence. On the other hand, age, parity, prolonged second stage of labor, episiotomy, and instrumental vaginal delivery were significantly associated with postpartum anal incontinence (10).

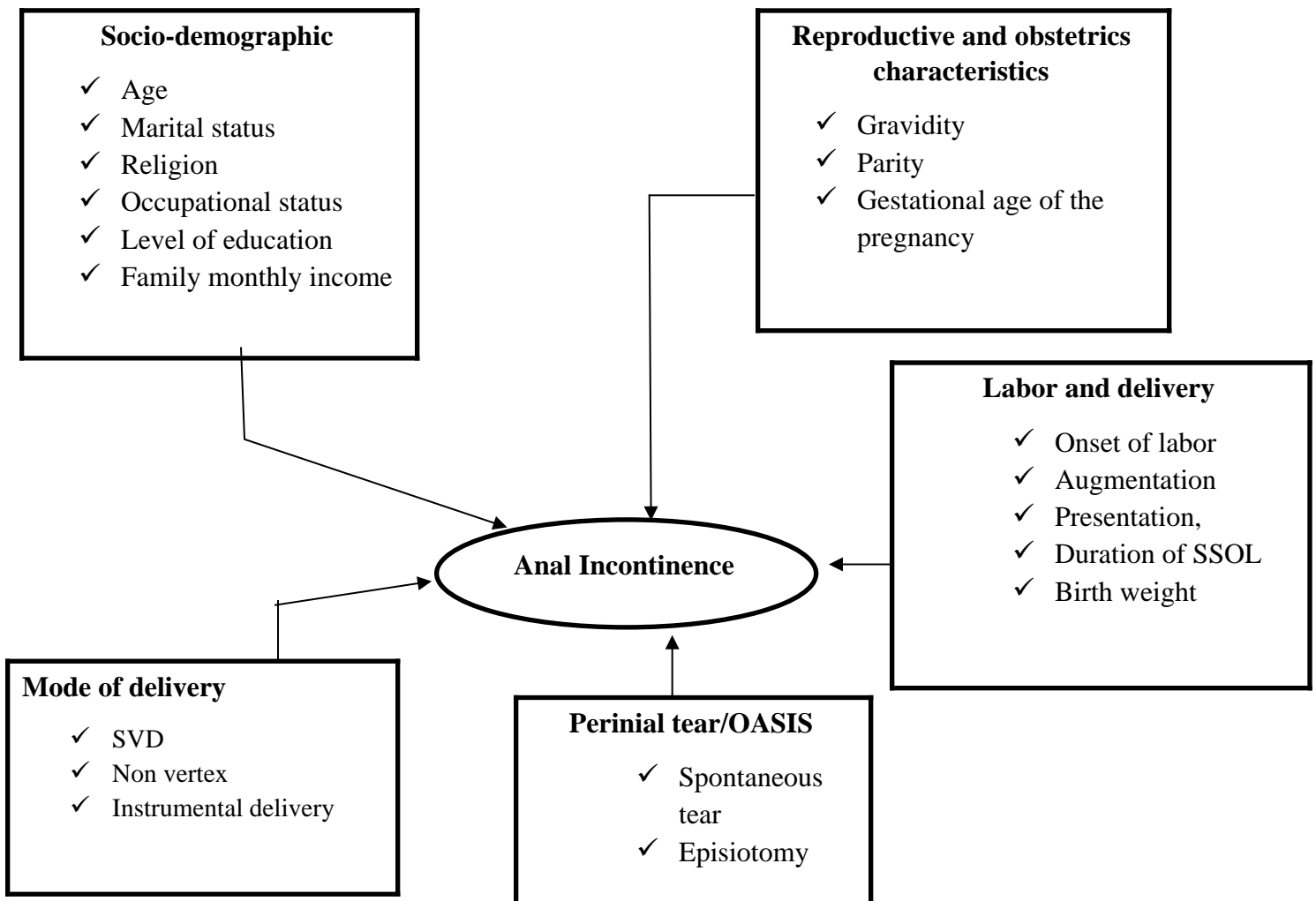
In study done in Norway on greater than 12,000 women on anal incontinence after vaginal delivery or cesarean section, one in four women with OASIS reported anal incontinence compared to one in six amongst the other women (15).

According to a Systematic Review and Meta-Analysis done on 19 articles on Obstetric Anal Sphincter Injury and Anal Incontinence Following Vaginal Birth and published on Journal of Midwifery and women's health, Pooled odds ratios (ORs) demonstrated a significant association between perineal trauma (episiotomy [OR, 1.74; 95% confidence interval [CI], 1.28-2.38;  $Q = 8.9$ ;  $P = .26$ ;  $I^2 = 21.4$ ] and third- or fourth-degree perineal laceration (OR, 2.66; 95% CI, 1.77-3.98;  $Q = 27.9$ ;  $P = .002$ ;  $I^2 = 64.1$ ) and anal incontinence (17).

A systematic review and meta-analysis done on Cesarean delivery to prevent anal incontinence in 2019 in Switzerland shows vaginal delivery was found not to be a significant predictor of postpartum AI compared to cesarean delivery in 6 studies, incorporating 18,951 deliveries (OR = 0.74; 0.54–1.02) (14).

## Conceptual framework

Studies and reports in different parts of the world reviewed different factors associated with AI. For this study according to the literature review the main factors identified are socio demographic factors, obstetric factor and maternal health condition. This conceptual framework was adopted by the different author from the different literature.



**Figure 1: The conceptual frame work of the determinants of AI**

## **OBJECTIVE**

### **3.1 General objective**

- ✓ To assess the magnitude of anal incontinence among women who delivered vaginally in three selected teaching hospitals in Addis Ababa, Ethiopia, 2021

### **3.2 Specific objectives**

- ✓ To identify prevalence of anal incontinence among women with vaginal delivery
- ✓ To identify socio-demographic factors associated with anal incontinence among women with vaginal delivery
- ✓ To identify reproductive and obstetric factors associated with anal incontinence among women with vaginal delivery
- ✓ To describe psycho social effects associated with anal incontinence among women with vaginal delivery

## **4. METHODS AND MATERIALS**

### **4.1. Study Area**

The study was done in Addis Ababa, According to Addis Ababa Health Bureau; currently the city has more than 41 hospitals, 28 health centers, 35 health posts and more than 500 clinics. There are more than 12 public and more than 25 private hospitals in the city. The study was conducted at GMH, ZMH and BLH hospitals in Addis Ababa, Ethiopia. These are among the largest public's hospitals in Ethiopia. The hospitals have maternity ward, labor ward, Emergency OPD, ANC, and different subspecialty OPDs and Gynecology ward.

### **4.2. Study Design and Periods**

A cross sectional descriptive study design was used and data collection was done at two points to assess prevalence of Anal Incontinence after 6weeks of vaginal

delivery in three selected teaching hospitals in Addis Ababa, Ethiopia, from November 2020 to March 2021.

### **4.3. Population**

#### **4.3.1. Source Population**

Women who gave birth vaginally, during the study period in Addis Ababa, Ethiopia 2021.

#### **4.3.2. Study population**

Women who gave birth vaginally in the selected Public hospitals during the data collection periods and fulfill in the inclusion criteria, in Addis Ababa, Ethiopia, 2021

### **4.4. Eligibility criteria**

#### **4.4.1. Inclusion Criteria**

- ✓ Women who delivered vaginally in the three hospitals
- ✓ Women who volunteer to participate in the study

#### **4.4.2. Exclusion criteria**

- ✓ Women who were previously diagnosed with AI
- ✓ Women with underlying neurologic disorders
- ✓ Women with diarrheal illness and IBD at the time of interview
- ✓ Laboring women admitted late in second stage with unknown duration of SSOL
- ✓ Women who delivered with cesarean section
- ✓ Those mothers delivered at GA less than 28wks or birth weight 1000 gm.

### **4.5. Sample Size Determination**

Considering the absence of previous data in Ethiopia, assuming the population is large and we do not know the variability in the proportion that will have the condition; 50% proportion ( $p=.5$  to achieve maximum variability) and the desired confidence level and precision of 95% and  $\pm 5\%$  respectively were used. The resulting sample size using Cochran's formula is calculated as follows:

$$n = \frac{Z^2 pq}{e^2} = \frac{(1.96)^2 0.5 \times 0.5}{(0.05)^2} = 384$$

Adding 20% nonresponse rate, the final sample size will be 461

Where n is the required sample size, P is the percentage occurrence of a state or condition, q is 1-p, e is level of precision required and Z is the value corresponding to level of confidence required

#### **4.6. Sampling Procedure**

Total deliveries for the last two months in the study area were obtained by referring the client's HMIS registration book for proportional allocation study subjects among the three hospitals. Accordingly 240,122 and 98 subjects were allocated to GMH, ZMH and BLH respectively. Finally, the study subjects were selected by using systematic random sampling technique by lottery method between odd and even individual medical record. Odd number was selected.

#### **4.7. Variables**

##### **4.7.1. Dependent variable**

Anal incontinence

##### **4.1.1 Independent variable**

##### **Socio-demographic**

- ✓ Age
- ✓ Marital status
- ✓ Religion
- ✓ Occupational status
- ✓ Level of education
- ✓ Family monthly income

##### **Reproductive and obstetrics characteristics**

- ✓ Gravidity
- ✓ Parity

- ✓ Gestational age of the pregnancy
- ✓ Onset of labor
- ✓ Augmentation,
- ✓ Presentation,
- ✓ Duration of SSOL
- ✓ Episiotomy
- ✓ Spontaneous Perineal tear(with or without episiotomy)
- ✓ Birth weight

#### **4.8. Operational Definitions**

**Anal incontinence:** the inability to control bowel movements, causing stool (feces) to leak unexpectedly from the rectum.

**Vaginal Delivery:** is the birth of offspring in mammals (babies in humans) through the vagina it is the natural method of birth for all mammals.

**Gestational age:** is the common term used during pregnancy to describe how far along the pregnancy is. It is measured in weeks, from the first day of the woman's last menstrual cycle to the delivery date.

#### **4.6 Data collection tool and procedure**

The data was collected using questionnaire adapted from International Consultation on Incontinence Questionnaire on Urinary Incontinence–Short Form (ICIQ-UI-SF) and risks factors associated with anal incontinence mentioned in different literatures.

Women who fulfill the inclusion criteria were included in the study. The study period was 3 months, from the first data collection to the last. The data collection had two phases:

The first phase was the time of collecting information regarding socio-demographic and clinical characteristics of the subjects in the immediate postpartum before the patient is discharged. Informed consent was attained from each participant for both phases of data collection before conducting the first phase data collection. The information to be collected in the first phase were independent variables like Age, GA, Episiotomy.... If additional information is required, the patient's medical record was used. After completing the first phase, the patient's phone number were documented and told the next interview will be after 6weeks of delivery.

The second phase of data collection was through telephone and questionnaire related to anal incontinence will be filled for respective patients in the first phase. The data completeness was checked and entered into spss version 25 for analysis.

Before data starting data collection, ethical clearance was obtained from the Research and Publication Committee (RPC) of the Department of Gynecology and Obstetrics, School of Medicine, AAU. The respondents were briefed about the research using an information sheet and asked to participate in the study voluntarily. The respondents were volunteers and gave consent were assured that the privacy and confidentiality of the study will be maintained. And the phase two telephone interview was conducted at the participants' chosen time of the day to assure their privacy and confidentiality.

## 5. RESULT

### 5.1. Socio demographic characteristics

From a total sample size of 460 mothers who delivered vaginally at Gandhi Memorial Hospital, Zewditu Memorial and Black lion Hospitals, 384 mothers responded to second phase data collection, making a response rate 83.3%. From all, 173 (45.1%) were in the age group 20-25 years followed by age group of 26 – 30 years, 135 (35.2%). The mean and median age of the mothers was 26 and 25 years respectively. More than 94% of them were married. More than half of the respondents, 210 (54.7%), completed primary education. (see Table 1).

**Table 1: Socio -demographic characteristics of the study group, (n=384).**

Variables	Category	Frequency	Percent
Age	< 20	16	4.2%
	20 – 25	173	45.1%
	26 – 30	135	35.2%
	31 – 35	45	11.7%
	> 35	15	3.9%
Marital status	Married	362	94.3%
	Single	22	5.7%
Religion	Orthodox	216	56.3%
	Muslim	108	28.1%

	protestant	55	14.3%
	Catholic	1	0.3%
	Others	4	1%
Educational status	Uneducated	30	7.8%
	Primary school	210	54.7%
	Secondary school	92	24%
	College and above	52	13.5%
Occupational status	House wife	281	73.2%
	Gov. employ	24	6.3%
	Private E.	79	20.6%

## 5.2. Obstetrics characteristics

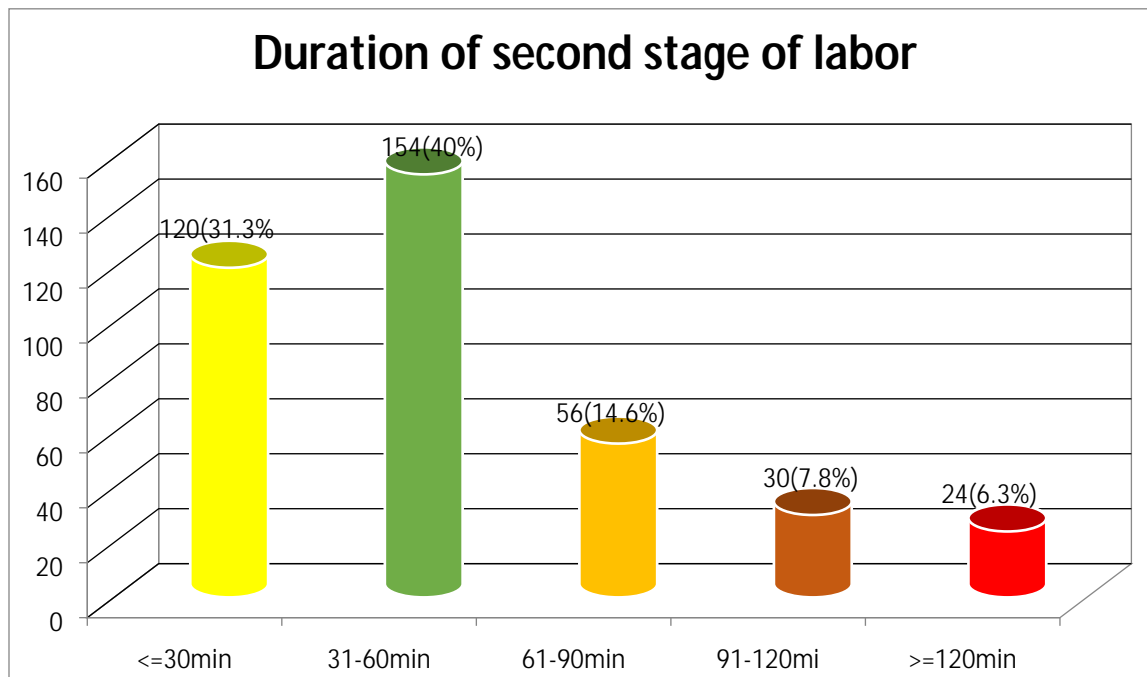
Regarding maternal obstetrics, almost half of them 194 (50.5%) of the participants were primiparous followed by para II (27.6%). The Gestational age of about two third (65.6%) of the participants was between 37 – 41 weeks. Late term and post term pregnancy account for 19.5%. Breech and face presentation only account for 3.6% (14/384) and the remaining 96.45% (370/384) were vertex. Majority of the deliveries were via SVD, 88.8% (341/384) and instrumental deliveries account for 8.8% (34/384). The still birth rate was 2.6% ( ). Nearly half of all mothers 181(47.1%) had episiotomy while 75(19.5%) of them has spontaneous perineal tear.

**Table 2: Participants obstetric characteristics, (n=384).**

Variables	Category	Frequency	Percent
Parity	I	194	50.5%
	II	106	27.6%
	III	48	12.5%
	IV and above	36	9.4%
Gestational age of the pregnancy	< 37 wks.	31	8.1%
	37 – 41 wks.	252	65.6%

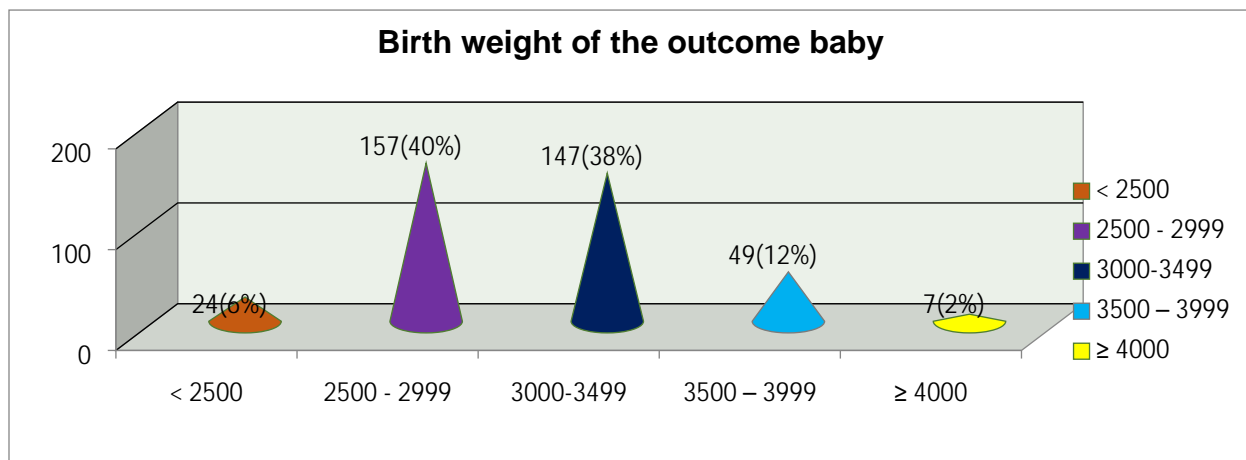
	>41 wks.	75	19.5%
	UK	26	6.8%
Presentation of fetus	Vertex	370	96.4%
	Breech	7	1.8%
	Face	7	1.8%
Onset of labor	Spontaneous	341	88.8%
	Induced	43	11.2%
Mode of delivery	SVD	338	88%
	Forceps	20	5.2%
	Vacuum	14	3.6%
	ABD	12	3.1%
Was labor augmented (n=341)	Yes	55	16.16%
	No	286	83.84%
Outcome of delivery	Alive	374	97.4%
	Stillbirth	10	2.6%
Spontaneous Perineal tear	Yes	75	19.5%
	No	309	80.5%
Perineal tear despite episiotomy	N=14 (14/75)		
Degree of perinea tear	1 <sup>st</sup> degree	58	15.1%
	2 <sup>nd</sup> degree	21	5.5%
Episiotomy	Yes	181	47.1%
	No	203	52.9%

**Duration of second stage of labor:** The following graph shows total duration of second stage of labor in minutes among study participants



**Figure 2: Frequency of Duration of second stage of labor (n=384).**

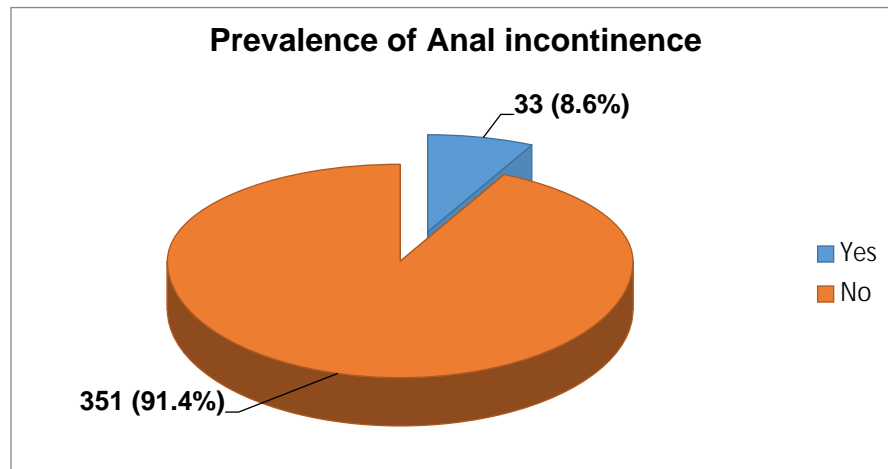
**Birth weight of the newborns among all study participants**



**Figure 3: Birth weight (n=384)**

### 5.3. Prevalence of anal incontinence at 6 weeks of vaginal delivery

In this study the prevalence of anal incontinence at 6 weeks of vaginal delivery was 8.6% (33/384). From all women having AI, 84.8% (/384) of them have only flatus incontinence whereas fecal incontinence account for 6% (2 /384) only. Both flatus and fecal incontinence constitute 9% ( 3/384).



**Figure 4:** Prevalence of anal incontinence at 6 weeks of vaginal delivery (n=384)

#### 5.4. psycho-social effects of AI among those women with the condition

In this study among those mothers who have anal incontinence, 5(15.5%) isolated themselves from social activities and seven (21.2%) of them felt sad due to their condition. Only two out of 34 sought medical advice. Three of them (8.8%) also had involuntary leakage of urine.

**Table 3: Impact of Anal incontinence among mothers with the condition (n=33).**

Variables	category	Frequency	Percent
Pain during/after defecation	Yes	2	6.6%
	No	31	93.4%
Leakage hamper relationship with husband	Yes	0	0
	No	33	100%
Self-isolation from social activities	Yes	5	15.5%
	No	28	84.5%
Feel sad due to condition	Yes	7	21%
	No	26	79%

Seeking medical attention	Yes	2	6.6%
	No	31	93.4%
Involuntary leakage of urine	Yes	3	9%
	No	30	91%
Difficult to differentiation feces and gas in rectum	Yes	1	3%
	No	32	97%
Postpone defecation for 15 min.	Yes	23	69.7%
	No	10	30.3%
Wear dippers	Yes	3	9%
	No	30	91%
Did soil pants	Yes	3	9%
	No	30	91%
Did soil the bed	Yes	2	6.6%
	No	31	93.4%
Leakages	Feces	2	6.1%
	Flatus	28	84.8%
	Both	3	9.1%

### 5.5. Factors associated with AI among women the condition

Questionnaires were complete for 384(90.99%) of the total sample size. These women constitute the study population described above.

To identify factors associated with AI among women who gave birth vaginally, each variable was assessed independently whether they were predictor of AI or not. Thus, bivariate analysis was done to test for significant associations between independent variables and AI. Variables (factors) which were associated with AI in the bivariate logistic regression analysis ( $P < 0.05$ ) were; Presentation of fetus, Mode of delivery, Duration of second stage of labor, Perineal tear and Degree of perineal tear. Variables which were associated with AI in the bivariate analysis were tested in the final multivariate analysis to see their significant association. After adjusting for potential confounders in multivariate logistic regression

analysis, two variables; Perineal tear and Degree of perineal tear were significantly associated with AI based on  $P < 0.05$ . respectively in this study (Table 7)

**Table 4: Factors associated with anal incontinence after vaginal delivery**

Variables	Category	AI		COR 95% CI	P-Value	AOR 95% CI	P-Value
		Yes (%)	No (%)				
Age							
	< 20	4(25)	12(75)	1			
	20 – 25	13(7.5)	160(92.5)	2.857(0.720,11.335)	0.135		
	26 – 30	10(7.4)	125(92.6)	3.906(0.913,16.705)	0.066		
	31 – 35	2(4.4)	43(95.6)	3.583(0.639,20.081)	0.147		
	> 35	4(26.7)	11(73.3)	0.055(0.106,2.860)	0.477		
Marital status							
	Married	29(8)	333(92)	2.552(0.810,8.042)	0.110		
	Single	4(18.2)	18(81.8)	1			
Educational status							
	Uneducated	5(16.7)	25(83.3)	0.306(0.068,1.386)	0.124		
	primary school	12(5.7)	198(94.3)	1.010(0.274,3.719)	0.988		
	Secondary school	13(14.1)	79(85.9)	0.372(0.274,1.372)	0.138		
	College and above	3(5.8)	49(94.2)	1			
Occupational status							
	house wife	21(7.9)	260(92.5)	1.592(0.698,3.630)	0.269		
	Gov. employ	3(12.5)	21(87.5)	0.900(0.23,3.630)	0.882		
	Private E.	9(11.4)	70(88.6)	1			
Parity							
	I	17(8.8)	177(91.2)	2.082(0.760,5.706)	0.154		
	II	6(57)	100(94.3)	3.333(1.001,11.099)	0.050		
	III	4(8.3)	44(91.7)	2.200(0.572,8.466)	0.251		
	IV and above	6(16.7)	30(83.3)	1			
Gestational age							
	< 37 wks.	2(6.4)	29(93.6)	1			
	37 – 41wks.	22(8.7)	230(91.3)	0.721(0.161,3.225)	0.669		
	>41 wks.	8(10.6)	67(89.4)	0.578(0.116,2.888)	0.504		
	UK.	1(3.8)	25(96.2)	0.1.724(0.147,20.167)	0.664		
Presentation							
	Vertex	28(7.6)	342(92.8)	1		1	
	Breech	3(42.9)	4(57.1)	<b>0.109(0.023,0.512)</b>	<b>0.005*</b>	0.723(0.019,28.096)	0.862
	Face	2(28.6)	5(71.4)	0.205(0.038,1.103)	0.065	8.029(0.001,12.062)	0.106
Onset of labor							
	Spontaneous	28(8.2)	313(91.8)	1			
	induced	5(11.6)	38(88.4)	0.680(0.248,1.866)	0.454		
MOD							
	SVD	19(5.6)	320(94.4)	<b>5.614(1.404,22.454)</b>	<b>0.015*</b>	4.829(0.309,75.434)	0.262

	Forceps	7(31.8)	15(68.2)	0.714(0.146,3.485)	0.677	0.776(0.039,15.376)	0.868
	Vacuum	4(36.4)	7(63.6)	0.583(0.097,3.506)	0.556	8.724(0.067,11.061)	0.968
	ABD	3(25)	9(75)	1		1	
Labor augmented							
	Yes	8(13.8)	50(86.2)	1			
	No	25(7.7)	301(92.3)	1.926(0.823,4.510)	0.131		
Duration of SSOL							
	< 30 min.	7(5.8)	113(94.2)	1		1	
	31 – 60 min.	13(8.4)	141(91.6)	0.672(0.259,1.740)	0.413	0.326(0.038,2.821)	0.316
	61 – 90 min.	5(8.9)	51(91.1)	0.632(0.191,2.086)	0.451	1.598(0.087,29.211)	0.752
	91 – 120 min.	3(10)	27(90)	0.558(0.135,2.298)	0.419	0.140(0.003,6.523)	0.316
	≥ 120 min.	5(20.8)	19(79.2)	<b>0.235(0.068,0.819)</b>	<b>0.023*</b>	0.152(0.009,2.601)	0.194
Outcome							
	Alive	31(8.3)	343(91.7)	1			
	Stillbirth	2(20)	8(80)	0.362(0.074,1.777)	0.210		
Birth weight							
	< 2500gm	1(4.2)	23(95.8)	1			
	2500 – 3000gm	11(7)	146(93)	0.577(0.071,4.683)	0.607		
	3000 – 3500gm	15(10.2)	132(89.8)	0.383(0.048,3.0390)	0.363		
	3500 – 4000gm	5(10.2)	44(89.8)	0.383(0.042,3.472)	0.393		
	≥ 4000gm	1(14.3)	6(85.7)	0.261(0.014,4.807)	0.366		
Had perineal tear							
	Yes	12(16)	63(84)	<b>2.612(1.22,5.585)</b>	<b>0.013*</b>	<b>7.641(1.443,40.453)</b>	<b>0.017*</b>
	No	21(6.8)	288(93.2)	<b>1</b>		<b>1</b>	
Degree of perineal tear							
	1st degree	5(8.6)	53(91.4)	<b>1</b>		<b>1</b>	
	2nd degree	7(33.3)	14(66.7)	<b>5.300(1.459, 19.253)</b>	<b>0.011*</b>	<b>5.344(1.144,25.635)</b>	<b>0.036*</b>
Episiotomy							
	Yes	15(8.3)	166(91.7)	1			
	No	18(8.9)	185(91.1)	0.929(0.454,1.901)	0.840		

## 6. DISCUSSION

Anal incontinence (AI), defined as the involuntary loss of fecal material or flatus, ranges in severity from an occasional leakage of stool while passing gas to a complete loss of bowel control.

The prevalence of fecal incontinence varies based on the definition used, how frequently the episodes occur, and the specific characteristics of the population studied, including age and whether the individuals are community dwelling or institutionalized. The prevalence of AI is often underestimated because more than three quarters of those having AI symptoms do not seek medical advice or intervention (1).

In this study, the prevalence of anal incontinence is 8.6% at 6 week postpartum. Flatus incontinence account for 85%, whereas fecal and both flatus and fecal incontinence account for 9% and 6% respectively.

This study shows nearly similar prevalence of anal incontinence after 6 weeks of delivery with study done in Nigeria in which the prevalence of AI was 12.6% (8).

Study done in Canada in 2006 shows altered fecal continence has been reported in as many as 25% of primiparous women at 6 weeks postpartum but data are lacking to know the prevalence of anal incontinence during specific postpartum period (2).

There was similar study done in France in 2003 on the prevalence of flatus-only incontinence or fecal incontinence showing 14.4 and 1.7%, respectively, between 3 and 6 months postpartum, with figures ranging from 6.3 to 45.3% for flatus incontinence and between 0.7 and 9.6% for fecal incontinence (9).

Anal incontinence is associated with reduced quality of life, negative psychogenic effects (3, 4), social stigma, and may result in significant physical and emotional distress, including depression, loss of self-esteem, and social isolation, anxiety and mortality, yet many women do not report their symptoms or seek treatment.

In this particular study, 5 out of 33 patients who have anal incontinence reported they have isolated themselves from social activity because of their condition. Seven of them also reported that they felt sad. Only two of them visited health facility to seek treatment. The major reason they stated for not seeking medical intervention is they have information from elder women as it often happens and do not know if it has treatment.

In the previously mentioned study in France, the percentage of depressed women was especially high among women with fecal incontinence (50.0%) but also higher in women with flatus incontinence (26.6%) than in continent women (17.2%) (4).

This study has similar findings with study done in New Mexico University done in 2013. In focus groups of women who reported fecal incontinence symptoms to their health care providers, patients stated that their physicians did not provide guidance on how to address the quality-of-life effects of fecal incontinence. Paradoxically, physicians reported that women with FI don't seek care because

they (patients) “don’t think treatment is available.” Perhaps it is true that both patients and physicians do not believe effective treatment is available.

The etiology of fecal incontinence is broad and typically divided into neurologic and non-neurologic causes. The most common presentations among women are non-neurologic, particularly fecal incontinence after obstetric anal sphincter injuries (OASIS) (3).. The other risk factors in different literatures include; instrumental delivery, genital-tract tears/lacerations, extended episiotomy, prolonged labor, macrosomia, and dystocia.

In this study, perineal tear is significantly associated AI(AOR = 7.641; 95% CI (1.4 43, 40.453)) compared to those who do not have recognized perineal tear. Third and fourth degree perineal tear was not registered in this particular study because it might be clinically unrecognized. Comparing first and second degree perineal tear, second degree perineal tear is significantly associated with AI i.e second degree tear is five times more risk than first degree tear (AOR=5.344(1.114,25.635)) which is similar to previous studies (1,4)

For childbearing women, OASIS is a well-known risk factor for AI. The severity of AI has previously been related to the degree of OASIS, that is, dependent on the involvement of the external and internal sphincter and whether the rectal mucosa has been affected (1,4). However, only half the cases of AI after childbirth can be attributed to OASIS. The other half may in part be caused by clinically unrecognized sphincter injury visible on ultrasound (occult OASIS) or by chronic pudendal neuropathy and contribute to postpartum fecal incontinence.

There is lack of studies whether first or second degree perineal tear is associated with anal incontinence to compare with this study. Even though there was no recognized of 3<sup>rd</sup> or 4<sup>th</sup> degree perineal tear in this particular study, there could be occult such degree of tear which needs further ancillary tests such as endoanal ultrasound

## **7. CONCLUSION AND RECOMMENDATION**

This study identified the prevalence of anal incontinence at 6 weeks of vaginal delivery was 8.6%. Perineal tear and higher degree of perineal tear are significantly associated with AI after vaginal delivery.

Since anal incontinence is associated with poor quality of life and majority of those women who have the condition do not report or seek medical advice because of embarrassment, giving information during ANC follow up and postpartum follow up, especially those women who had perineal tear/OASIS is necessary. In addition, health care providers should have adequate knowledge on prevention, detection and treatment. Researchers are recommended to conduct similar study in the area with different design, especially follow-up studies, and community based designs to explore the actual prevalence of AI and to further examine variables associated with the AI.

## **8. STRENGTH AND LIMITATION**

### **8.1. Strength of the Study:**

- ✓ In this study, the prevalence of AI and its determinant factors after six weeks of vaginal delivery in the study area was assessed.

### **8.2. Limitation of the Study:**

- ✓ Some mothers didn't pick up their phone during call for second phase data collection and non-respondent rate was 20%.
- ✓ In addition, for those who have anal incontinence symptoms, they need to be evaluated with complete medical history, physical examination and ancillary tests if necessary.

- ✓ This is institutional based study and the deliveries were conducted by professional birth attendants, so it would have been better if it was community based study to get real figures.

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## 10. ANNEXES

### ANNEX I– Information Sheet

Here, I the undersigned at Addis Ababa University, College of Health Science, Department of Obstetrics and Gynecology, currently I will be undertaking research on a topic entitled Prevalence anal incontinence six weeks after vaginal delivery: prospective study in the three teaching hospitals (BLH, ZMH, GMH) in Addis Ababa, Ethiopia. For this study, you will be selected as a participant and before getting your consent or permission of your participation, you need to know all necessary information related to the study. Thus, this information will be detailed as;

**Objective:** To assess the prevalence and Determinant factors of anal incontinence among delivered mothers who are attending post natal care at selected Public hospitals in Addis Ababa, Ethiopia.

**Significance of the study:** This study will assist in knowing the magnitude of AI and passing recommendation for practitioners and policy makers to pay attention on anal incontinence after vaginal delivery. And also it serves as an input in the health education program by different organizations so as to keep the community aware of the condition and increase health seeking behavior.

**Procedure:** You are invited to take part in this study based on your willingness by giving us your verbal consent. I will take your interview. All the information you give will be confidential. The information will be available only to the study team. If you are not willing to participate in the study, there will be no service to be withheld from you.

**Risk/ Discomfort:** By participating in this study, there is no harm to you. We only need 10 minutes of your time to answer some question while you are under the care and on telephone when required.

**Incentives:** You are participating in this study voluntarily and no monetary incentive will be made.

**Confidentiality:**The information collected for the study will be kept confidential and information about you that will be collected for this study will be stored in a file. And it will not be revealed to anyone except the investigators.

**Right to refuse or withdraw:**You have full right to refuse from participating in this study. You can choose not to respond to some or all questions if you do not want to give your response. You have also the full right to withdraw from this study at any time you wish, without losing any of your right.

**Persons to contact:**This study is reviewed and approved by the Ethical clearance committee of the department of the college of health science, Addis Ababa University. If in case you want to know more information about the study and its undertakings, you can contact the committee through the address of the advisor and/or the principal investigator below.

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Annex IV questionnaire

Addis Ababa University, College of Health Sciences Department of Obstetrics and Gynecology

Questionnaire designed to assess awareness, Prevalence anal incontinence after vaginal delivery in GMH, BLH and ZMH in Addis Ababa, Ethiopia.

Greetings;

My name is \_\_\_\_\_ from \_\_\_\_\_

We are conducting a study to assess Prevalence anal incontinence after vaginal delivery in GMH, BLH and ZMH. You are kindly requested to be included in the study; which will have importance in improving maternal mortality and morbidity at our hospitals and country as a whole. We need your name for the next phone contact. The study is anonymous; your personal information will be kept strictly confidential. Your participation in the study is voluntary and you have the right not to participate in the study. If you agree to participate, the study will be conducted in two phases. Phase one interview will be conducted now and will take 10 minutes. Phase two interview will be conducted after 6 weeks through telephone at your convenient time of the day and will take 10 minutes.

The study has approval and ethical clearance from department of Gynecology and Obstetrics research and publication committee of Addis Ababa University.

May I continue?

If yes, continue interviewing

If No, thank and stop interviewing.

Questionnaire No \_\_\_\_\_ Date \_\_\_\_\_ Hospital \_\_\_\_\_

Data collector name \_\_\_\_\_ Signature \_\_\_\_\_

Patient full name.....Telephone.....

Supervisor Name \_\_\_\_\_ Signature \_\_\_\_\_

**Annex III: Questionnaire**

**Instruction: Circle the code number, given parallel to the answer you choose and for Questions that you give direct answer, write the answer in the space provided**

S. No	Questions	Alternative Answers	Skip	Remark
101	<b>Socio-demographic characteristics</b>			
1	Age of the mothers in complete year	-----		

2	Marital status of respondents	A. Sigel C. Divorced E. Others specify .....	B. married D. widowed		
3	Religion	A. Orthodox C. Protestant E Others specify .....	B. Muslim D. Catholic		
4	Native language	.....			
5	Educational status	A. Illiterate B. Primary Education C. Secondary education D. Certificate and above			
6	Occupational status	A. House wife B. Government employ C. Private employ			
<b>201</b>	<b>Part-II: Reproductive and obstetrics/ clinical variables</b>				
1	Parity	.....			
2	Gestational of the pregnancy during delivery (in complete weeks)	.....			
3	Presentation of the fetus	A. Vertex C. Face specify .....	B. Breech D. Others		
4	Onset of labor	A. Spontaneous	B. Induced		
5	Mode of delivery	A. SVD C. Vacuum E. DVD	B. Forceps D. ABD		

6	Was labor augmented	A. Yes                      B. No		
7	Duration of second stage of labor	..... (in minutes)		
8	Outcome of baby	A. Alive                      B. still birth		
9	Birth weight of the baby in gram	.....		
10	Was episiotomy	A. Yes                      B. No		
11	perennial tear	A. Yes                      B. No		
12	If your answer for question 11 is yes, degree of the tear	A. 1 <sup>st</sup> degree                      B. 2 <sup>nd</sup> degree C. 3 <sup>rd</sup> degree                      D. 4 <sup>th</sup> degree		
<b>301</b>	<b>PART III questions related to anal incontinence</b>			
1	Are you having uncontrolled (involuntary) passage of feces Or flatus for the last 6weeks?	A. Yes B. No		
2	If your answer for question No. 1, go question no. 17part 3.			
3	If your answer for question No. 1 is yes, which one	A. feces                      B. flatus                      C. Both		
4	Does it soil your pant	A. Yes                      B. No		
5	Does it soil your bed	A. Yes                      B. No		
6	Do you wear diapers (such as Pampers) to prevent soiling Of yourself/bed?	A. Yes B. No		
7	Can you postpone defecation for 15min?	A. yes                      B. No		
8	Is there difficulty differentiating between gas and stool in the rectum?	A. Yes B. No		
9	Is there anal pain during or after defecation?	A. Yes B. No		
10	Does the leakage hamper your	A. Yes                      B. No		

	relationship with your husband?			
11	Does the leakage cause people to avoid/isolate you?	A. Yes	B. No	
12	Do you feel sad about you condition?	A. Yes	B. No	
13	Do you have loss of interest?	A. Yes	B. No	
14	Do you have weight loss?	A. Yes	B. No	
15	Did you seek medical advice or treatment?	A. Yes	B. No	
16	If No to Q26, what is your reason for not seeking medical advice/ treatment? Specify	A. Yes	B. No	
17	Do you have involuntary leakage of urine?	A. Yes	B. No	

### **DECLARATION**

By my signature below, I declare and affirm that this thesis is my own work. I have followed all ethical principles of scholarship in the preparation, data collection, data analysis and completion of this thesis. All scholarly matter that is included in the thesis has been given recognition through citation. I affirm that I have cited and referenced all sources in this document. Every serious efforts been made to avoid any plagiarism in the preparation of this thesis.

This thesis is submitted in partial fulfilment of the requirement for the degree of specialization in Obstetrics and Gynaecology in Addis Ababa University School of Medicine. I would like to declare that this thesis has not been submitted to any other institution anywhere for the award of any academic specialization, degree, diploma or certificate.

Name: \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_