

ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCE
SCHOOL OF ALLIEDHEALTH SCIENCES
DEPARTMENT OF NURSING AND MIDWIFERY

**ASSESSMENT OF FREQUENCY OF VAGINAL EXAMINATION AND
ASSOCIATED FACTORS BY HEALTH CARE PROVIDERS DURING
NORMAL LABOUR IN SELECTED PUBLIC HOSPITALS**

IN ADDIS ABABA, ETHIOPIA

BY: ABERASH EIFA (BSc.M)

**THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS
ABABA UNIVERSITY COLLEGE OF HEALTH SCIENCES, DEPARTMENT OF
NURSING AND MIDWIFERY IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN MATERNITY
AND REPRODUCTIVE HEALTH NURSING**

JUNE 2015

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Approval by the Board of Examiners

This thesis is by Aberash Eifa accepted in its present form by the Board of Examiners as satisfying thesis requirement for the degree of Masters of Science in Maternity and Reproductive Health Nursing.

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Abbreviations

AAU	Addis Ababa University
AOR	Adjusted Odd Ratio
APH	Ante partum Hemorrhage
COR	Crude Odd Ratio
GO	Governmental Organization
L & D	Labour and Delivery
MDG	Millennium Development Goal
MOH	Ministry Of Health
NGO	Non Governmental Organization
NICE	National Institute for Health and Clinical Excellence
PI	Principal Investigator
PROM	Prolonged Rapture of Membrane
SPSS	Statistical Package for Social Science
VE	Vaginal Examination
WHO	World Health Organization

Abstract

Background: The National Institute for Health and Clinical Excellence (NICE) Intrapartum guidelines recommend that vaginal examination (VEs) should not be routinely performed and that women should be ‘offered’ a VE every four hours. Research has shown that the performance of multiple vaginal examinations can be a risk factor for maternal or fetal infection.

Objectives: To assess the reasons and frequency of vaginal examination by health care providers during normal labour in selected public hospitals of Addis Ababa, Ethiopia from April to May 2015

Methods: Institutional based cross-sectional descriptive study was conducted and the study participants were health personnel who attend to labour cases in the selected public hospitals and clients with normal labour who consented to participate in the study during the study period were included. Study setting was selected purposively based on its client flow from the total public hospitals in Addis Ababa and convenience sampling technique was used for selecting study participants.

Result: In this study the number of vaginal examination performed for each women ranges from one to seven (mean 2.24, SD 0.67), the majority of them were examined 3-4 times 93 (50.0%) during their labour time. The main reason given by health care providers to conduct vaginal examination was to check the onset of labour and to check progress of labour .Logistic regression analysis showed that 1-2 health care providers 0.043 times less likely had frequent vaginal examination when compared to 3-7 health care providers with adjusted OR 0.043; 95% CI (0.006, 0.330).

Conclusion and recommendation: frequency of vaginal examination is mostly affected by number of health care providers who conduct VEs and duration of labour. So, vaginal examination should have performed only when it is necessary by following WHO guidelines.

Keywords: Vaginal examinations; Progress in labour; health care provider; Labour

1. Introduction

1.1 Back ground

The vaginal is not a sterile cavity, so every vaginal examination increases the danger of intrauterine infection, if carelessly performed. A vaginal examination is uncomfortable and embarrassing for the patient. Careful abdominal examination gives a lot of information and it is always before vaginal examination. When doing a vaginal examination, it is useful to find out all the information you can, this may save it having to be repeated (1).

A vaginal examination (VE) is an extremely intimate examination which is performed regularly and accepted as a routine procedure by midwives during labour. VE can be performed digitally, or by using instruments such as a speculum. In midwifery care, a woman in labour is often subjected to at least one VE, and often these are repeated every 4 hours on obstetric orders or according to the practice requirements of the birth unit. As the average labour lasts between 8 and 12 hours, most women can expect to have at least two or three VEs during their labour. The woman in labour and her labour companions often rely solely on the VE as the indicator of labour progress. In midwifery care, a VE is used to assess the degree of opening of the cervix so that the labour progress and time of birth can be estimated (2).

Puerperal infection (also known as childbed fever) is a global leading cause of maternal death, over 6 million cases yearly lead to at least 77,000 maternal deaths worldwide, most of which occur in low-resource countries (3).

Death rates from genital tract sepsis have risen considerably over the last decade, from 0.85 deaths per 100 000 maternities in 2003–5 to 1.13 deaths in 2006–8. It has become the leading cause of direct maternal mortality in the UK for the first time. In the most recent report of the Confidential Enquiries into Maternal Deaths in the United Kingdom there were 26 direct and 3 late direct deaths due to genital tract infection and almost 70% of them occurred due to substandard care (4). Puerperal infections are caused by transfer of an infectious agent from the cervix or vagina to the uterus during labor or pelvic examination or by transfer of bacteria from skin, nostrils, and perineum by contaminated fingers or instruments (5)

A study done in Hawassa shown that the top four causes of maternal mortality in the year 1980-1999 were abortion related complications (31%), obstructed labor/uterine rupture (29%), sepsis/infection (21%) and hemorrhage (12%).

In the last decade, however, the top four causes of maternal mortality were obstructed labour/uterine rupture (36%), hemorrhage (22%), hypertensive disorders of pregnancy (19%) and sepsis/infection (13%). Particularly, the reports from Jimma and Ambo hospitals showed that more than a quarter of maternal deaths were due to infection. Among single hospital-based studies, relatively low proportion of maternal deaths due to infection was reported from Atat Hospital. Similarly, the national study revealed that the proportion of infection related maternal mortality was the lowest among the top five causes of maternal mortality reviewed above (obstructed labour, Hypertensive Disorder during Pregnancy, hemorrhage, abortion and sepsis) (5,6).

In Ethiopia Overall, septic complications of pregnancies are responsible for 40% of maternal deaths (7). Vaginal examination provides a variety of information, such as fetal presentation, position and descent of the presenting part along with information on cervical effacement, consistency and dilatation of the cervix these factors can be variable, overall the vaginal examination is an important skill that midwives should develop and which can help them to interpret labour rhythms and signal deviations from the physiological process (8).

Vaginal examination offered 4 hourly, or where there is concern about progress or in response to the woman's wishes (after abdominal palpation and assessment of vaginal loss (9). The WHO recommends that VE should be conducted at 4 hours interval and by the same provider if possible (10).

1.2 Statement of the problem

A vaginal examination is an internal examination of the vagina and cervix (bottom part of the uterus at the inside end of the vagina) and is sometimes called an 'internal,' 'VE' or 'internal examination (11).

For most labour and delivery (L & D) nurses, vaginal examinations have almost become routine procedure and are often performed without much forethought for negative consequences. Although a quick vaginal exam can deliver an abundance of information in terms of cervical effacement, dilatation, membrane integrity and fetal position and station, it is inherently an invasive procedure that may be risky in certain situations.

Furthermore, research has shown that the performance of multiple vaginal examinations can be a risk factor for maternal or fetal infection. Maternal infection may occur during labor (chorioamnionitis) or after birth (postpartum endometritis), and prolonged rupture of membranes and multiple vaginal examinations are known risk factors for the development of maternal and neonatal infection. However, infection can also be an etiologic factor that causes pre-labor rupture of membranes (12).

There is a reported link between the numbers of VEs a woman has and the risk of puerperal sepsis. Currently, in the USA, 5.5% of vaginal deliveries and 7.4% of caesarean deliveries are complicated by postpartum infections; the greater the number of VEs associated with an increased risk of genital tract infection. Due to the problems associated with VEs noted above, guidelines have recommended their restricted use. For example, the National Institute for Health and Clinical Excellence (NICE) Intrapartum guidelines recommend that VEs should not be routinely performed and that women should be ‘offered’ a VE every four hours in the first stage of labour. The relationship between VEs during labour and infections was documented. VE adds more pain, discomfort and anxiety, triggers feelings of fear, shame, guilt, exposure and powerlessness, and thus negatively influences women’s satisfaction. For these reasons, the International Clinical Guidelines recommended a limited number of VEs during labour (10, 13).

In developing countries, puerperal sepsis continues to cause many unnecessary deaths mainly because of inadequate access to care during child birth and poor quality of care. Individual studies from developing countries suggested that the incidence of puerperal sepsis is between 0.1% and 10% of deliveries. A systematic review published in 2006, data from individual studies were used to generate combined estimates of causes of death distribution by region; 11.6% of maternal death in Asia due to puerperal sepsis, 9.7 % in Africa and 7.7% in Latin America and the Caribbean, compared with only 2.1% in developed countries.(14)

Despite this there is high frequency of vaginal examination performed for laboring mother. This study aimed to investigate the number of VEs performed in relation to length of labour and the reasons given by health care providers for performing the VE (15).

1.3. Significance of the study

Information with respect to factors influencing vaginal examination among women of child bearing age group are of relevance for designing, initiating or modifying quality health care during labour and delivery. To the best of my knowledge, there are no research reports on this topic in the study setting. I believe that the scarcity of available data on this topic in the study area has limited the development of intervention strategies, which aims to improve maternal health.

Given the importance of integrating and coordinating intervention to monitor progress towards achievement of the 5th Millennium Development Goal (MDG) which aims to improve maternal health, it is vital to arrive at a set of priority actions to guide program development and the implementation process. The process for priority setting should start with the assessment and analysis of the situation that women face in the health institution during labour and delivery

This study helps the health care providers to check their practical activities and improve their practice, decrease the complication happiness to the mothers. It also provides support for police makers to design and modify quality health care.

Information gathered from this survey will provide baseline data and will elicit support and promote cooperation among the difference stakeholders towards preventing mothers and child morbidity and mortality by providing quality health care in the setting.

2. Literature review

2.1. Frequency of vaginal examination

Several studies revealed that women seem to have more VEs than expected during labour, despite the presence of institutional policy guidelines on performing VEs at certain institutions. One study found that midwives also frequently perform VEs which are not officially recorded, often referred to in the case notes as ‘quickies’ (16).

A study conducted by Berg storm *et al.* in 1992 found there was a variation between 2–17 times in the number of VEs conducted during labour; for one woman, a VE was performed following every contraction (17).

Study done in Scotland shows, the number of VEs carried out on each woman in the group ranged from one to seven (mean 2.9, SD 1.5). Approximately half of the women in this sample (n= 75, 52%) had 3 or more vaginal examinations during the course of their labour. Almost 70% (99 women) had more VEs than expected when the criteria of 4 hourly VEs was applied to their length of labour in hospital. Of those women admitted in spontaneous labour 66% (73/111) had more VEs than 1 every 4 hrs compared with 79% (26/33) women admitted for induction of labour. The mean frequency of VE was five times (SD=2.4) ranging from one to 15 times. The main impact of the VE on the women’s future reproductive decisions was fear of having another pregnancy (15).

Study done by a busy midwifery service at a large academic center in 2011 underwent an audit of the number of vaginal examinations performed in labour for 205 women admitted in spontaneous labor or with spontaneous rupture of membranes. The retrospective chart audit performed by research midwives was reports on average; a woman underwent 4 vaginal examinations during labor, a rate greater than the World Health Organization recommendation of 1 examination every 4 hours during the first stage. The rate of presumed chorioamnionitis in this group of healthy, low-risk women was 6% and women with this diagnosis averaged 7 vaginal examinations (18).

Study done on Palestinian women interviewed 176 women of age varied from 16 to 42 with a mean of 26.3 years. The majority (72%) of women were younger than 30 years. The mean (SD) years of education was 10.4 (3.52).

Around 68% of women had more than 9 years of education and the majority (74%) lived in rural areas. 26% of women were primipara. Midwives assisted 79% of women during childbirth.

The Study tested the frequency of vaginal examination against selected indicators. There was no significant difference between the proportion of women receiving low and high frequency of VEs during childbirth and their age, place of residence, education level, parity, complications and the time of delivery. The proportion of women who had potentially 'high' frequency of VEs during childbirth was significantly larger when the number of providers conducting VE was 'high' and significantly larger when the woman is a primipara than multipara women (11).

A prospective randomized study was conducted to assess whether the frequency of vaginal examinations can influence the duration of labour. One hundred and nine nulliparous patients in spontaneous labour, after 37 completed weeks of gestation, were randomly allocated to receive either 2-hourly or 4-hourly vaginal examinations to assess the progress of labour. There was no difference in the total duration of labour in both groups or in the total number of vaginal examinations. The results of the study indicate that, as far as the duration of labour is concerned, there is no added value in advocating 2-hourly vaginal examinations to shorten labour (19).

Study conducted in 2002 in three midwifery units in Cambridge shire, England, Overall, women reported an average of three vaginal examinations per labour. When age data were recorded, 41 women were placed in a younger age group (16–30 years) and 23 in an older age group (31–50 years). The younger group reported an average of 3.0 vaginal examinations in labour (standard deviation [SD]=1.8), the figure for older women was 2.8 (SD=1.3). The younger group rated the performance of their health professionals as 8.1 out of 10 (SD=2.0); the respective figure for the older group was 7.6 (SD=2.2) (20).

Research done on completion of the modified WHO partograph during normal labour in public health institute of Addis Ababa, Ethiopia from December 2011 to February 2012 reports that four hundred and twenty of the modified WHO partograph that had been used for labour management. Measurement of cervical dilatation was recorded in 248(59.1%) of the partograph but almost half [110(44.4%)] of these records were substandard while cervical dilatation was not recorded in 172(41.4%) of the partograph. Uterine contraction was not recorded in 189 (45.0%) while recorded to the standard in 87(20.7%) and sub-optimally recorded in 144 (34.3%) of the partographs (21).

Study done on Audit of use of tap water for vulval and perineal cleansing in 1998 shows the majority of staff were using tap water for vaginal examinations 90% (n=52), and normal deliveries 84% (n=49) (22) .

2.2. Reason of vaginal examination

Study done by Berg storm *et al*, the main reasons given by midwives for performing VEs during labour were to assess the progress and onset of labour, to assess the patient's contractions of the abdominal muscles and diaphragm during labour, and to teach the woman the correct way of forcefully contracting the muscles and diaphragm during labour. The findings of systematic review show that VEs were conducted too frequently and by many providers, and that the most common reasons given by midwives for performing a VE was to assess the progress and commencement of labour (2, 16)

Study done at Scotland the main reason for performing a VE was to assess labour progress with over half of the VEs (51%) conducted for this reason. The next main reason for performing a VE was to assess the onset of labour (29%) with only 20% of VEs performed for other reasons including prior to induction or analgesia. It is interesting to note that 10 women had more than one VE to diagnose labour onset. Of these 10 women, three had three VEs performed for this purpose and one woman had four. The number of VEs was clearly associated with the length of labour in hospitals with the number of VEs performed increasing as length of time in labour increased (15).

2.3. Conceptual framework

Among socio demographic factors age has an influence on frequency of vaginal examination as age decrease the number of vaginal examination increase due to complain of more pain, primigravida also have high number of vaginal examination due to their labour length. As length of labour, number of health care providers increases the frequency of vaginal examination also increase. When health care providers did not use the partograph and guide line for induction and augmentation there will be inappropriate vaginal examination. So all the factor listed have their effect on frequency of vaginal examination. Preventing repeated number of vaginal examination by appropriate use of partograph have the following out comes (1) it decrease puerperal infection, (2) It decrease distress experienced by clients and (3) It reduce the maternal morbidity and mortality from puerperal sepsis.

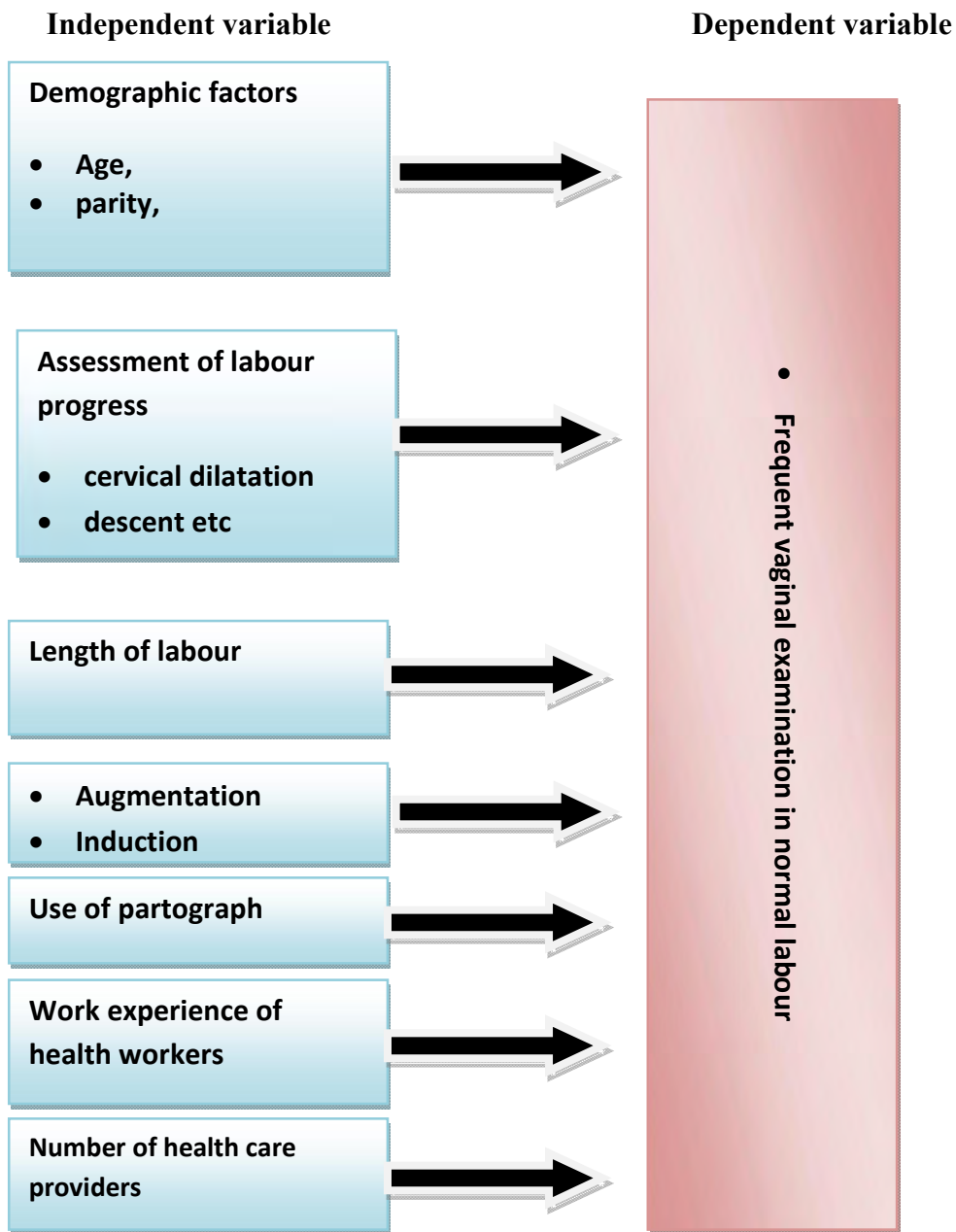


Fig 1: Modified conceptual frame work adopted from (Hassan et al. Reproductive Health 2012, 9:16 and A. Shepherd, H. Cheyne,) (11,15).

3. Objective

3.1 General objective

- ❖ To assess the frequency of vaginal examination and associated factors by health care providers during normal labour in a selected public hospitals in Addis Ababa, Ethiopia from January to June 2015.

3.2 Specific objective

- ✓ To assess the frequency of vaginal examination performed for labouring mother by health care providers in response to their labour length
- ✓ To identify the associated factors of frequent vaginal examination

4. Methodology

4.1 Study area

The study was conducted in Addis Ababa, the capital city of Ethiopia and seat of African Union & United Nations World Economic Commission for Africa. Addis Ababa has a population size of over 3 million (3,038,096) with annual growth rate of 2.1% (data obtained from central statistical agency of Ethiopia). The city is divided into ten sub-cities and 100 Kebeles (lowest administrative units in Ethiopia). Addis Ababa is located at 9° 1' 48" North and 38° 44' 24" East and the total land area is 54,000 hectares. Its average elevation is 2,500 m above sea level, and hence has a fairly favorable climate and moderate weather conditions.

In Addis Ababa there are 45 Hospitals, 29 health centers 130 health stations. And 43 health post owned by Ministry Of Health (MOH), Governmental Organization (GO), None Governmental Organization (NGO) and private the total estimated number of nurses and midwives working in the maternity department of hospitals and health centers are about 424. Medical personnel in Addis Ababa excluding man power outside the MOH are 128 where 42% are working at the city government health facilities. There are 120 Nurse and 60 midwives in five governmental hospitals. There are 336 nurses in health centers and 42 midwives totally 558 nurses and midwives (23).

Tikur Anbessa Specialized Hospital (TASH)

In 1998, the TASH, the largest referral hospital in the country, with 700 beds, was transferred to the School by the Federal Ministry of Health, and it has since become a University teaching hospital. The Tikur Anbessa Specialized Hospital is now the main teaching hospital for both clinical and preclinical training of most disciplines. It is also an institution where specialized clinical services that are not available in other public or private institutions are rendered to the whole nation.

Gandhi Memorial Hospital, Addis Ababa, Ethiopia

This hospital was established by Mahatma Gandhi in 1948 E.C. and it gives primarily cares for women and babies. It gives service for 58,000 populations annually. Gandhi memorial hospitals have 384 total staffs. Labour and delivery room have give service on seven waiting beds & two catches.

Tirunesh Beijing General Hospital

Tirunesh Beijing Hospital was established in 2004 E.C. It is found in Akaki Kality Kfle Ketema around 25 km from Addis Ababa, under Addis Ababa health bureau. It was named after athlete Tirunesh Dibaba who won two gold medals at the 2008 Beijing Olympics; it was built by the Chinese government. It has 100 beds

4.2 Study design and period

Institutional based, cross-sectional study was conducted from April to May 2015.

4.3. Source population

The source population comprised of all health care providers working in maternity units and laboring mother who are admitted to labour ward of selected public hospitals in Addis Ababa.

4.4. Study subject

All health care providers who attend to labour cases in selected public hospital and Clients with normal labour including induction and augmentation.

4.4.1. Inclusion criteria

All health care providers who attend to labour cases in selected public hospital and clients with normal labour including induction and augmentation, who consented to participate in the study, were included

4.4.2. Exclusion criteria

Health professionals who did not attend labour cases in selected public hospitals Client with abnormal labour like multiple pregnancies, mal-presentation, Ante-partum hemorrhage (APH), preterm rupture of membrane (PROM) and obstructed labour.

4.5. Sampling procedure

Study setting was selected randomly from the eight public hospitals in Addis Ababa and convenience sampling technique was used for selecting study participants. So all normal laboring mothers admitted to labour ward during the study period was included in the study.

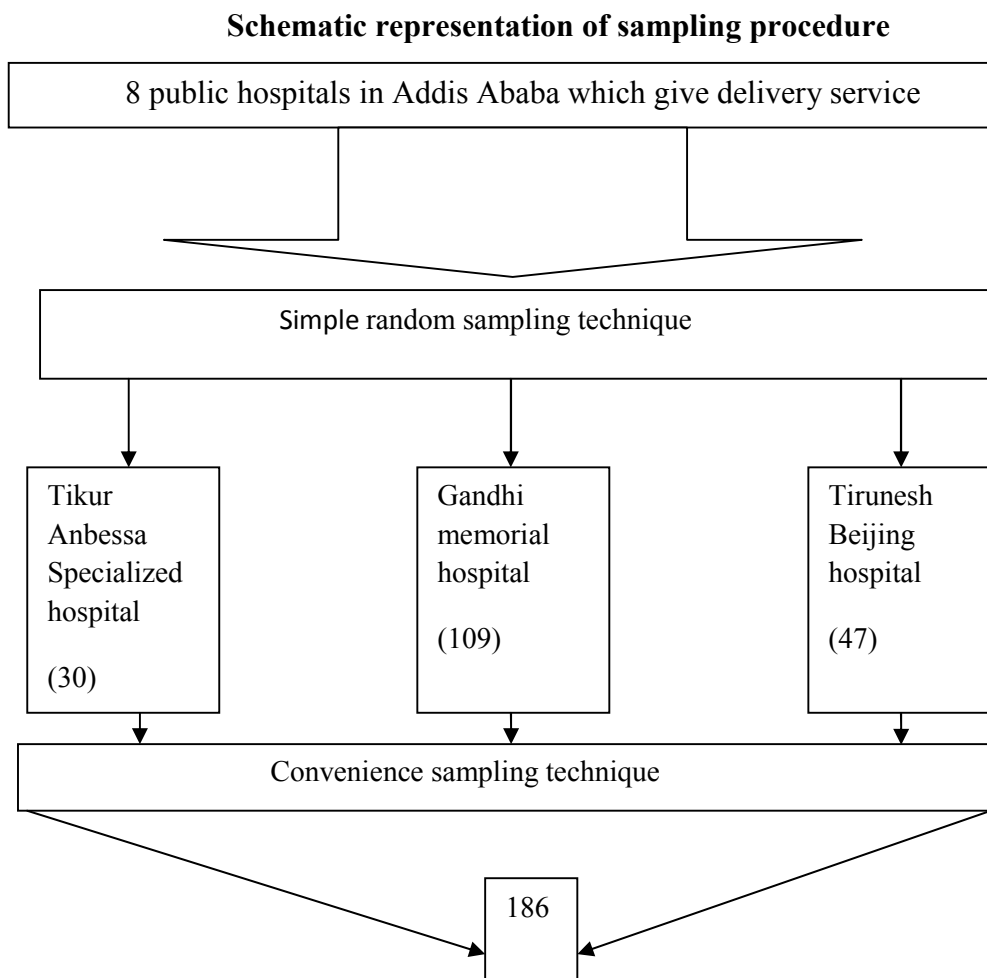


Figure 2: Schematic representation of sampling procedure

4.6. Data collection procedures

Semi structured questionnaires in English language was developed for data collection on the variables needed. Health care providers were asked to document on a data collection questioner, the time that active labour commenced (regular moderate/ strong contractions and cervix 4 cm), and time of delivery. Throughout labour they were also asked to record the time when each VE was performed, the dilatation of the cervix and the main reason for conducting that VE. For each woman, the total number of VEs was documented along with total length of labour. Ethical approval was granted

4.7. Pretest

Pretest was done in Yekatit 12 Memorial Hospital which was not included in the study for one week on 10 respondents before conducting main study and modification was done on the questioners based on the finding.

4.8. Data collectors

Data was collected by three trained diploma female midwives using a pretested self administered semi structured questionnaire. The data collectors were trained for one day on how to administer questionnaires. The questionnaire was adopted from reviewed literatures (Hassan et al. Reproductive Health 2012, 9:16 and Women and Birth (2013) 26, 49—54). The questionnaire consists of four parts which include: socio-demographic characteristics (age, religion, marital status, and educational status), obstetric characteristics, vaginal examination characteristics and reason of vaginal examination. The principal investigator and the coordinators were strictly follow the overall activities on daily base to ensure the completeness of questionnaire, to give further clarification

4.9. Variable of the study

4.9.1. Dependent variables

- Frequency of vaginal examination done by health care providers

4.9.2. Independent variables

- Socio- Demographic factors
- Parity/gravidity
- Progress of labour
- Length of labour
- Partograph
- Intervention like augmentation
- work experience of health workers
- Number of health care providers

4.10. Operational definitions

Frequent vaginal examination: It is vaginal examination performed by health care providers more than WHO guide line recommendation (one in every four hours).in relation with length of labour.

Correct vaginal examination: It is vaginal examinations performed according to the standard that is one examination every four hours in relation to length of labour.

Incorrect vaginal examination:. It is vaginal examinations performed more than the standard of WHO guide line that is more than one examination within four hours in relation to length of labour.

4.11. Data quality assurance

The data collection tool was used and the questionnaires were pre-tested on 10 respondents on the same source population in hospital which was not selected for the study. Based on the findings of the pre –test some modification and improvement or correction of the tool was done. Training was given for data collectors and coordinator. Data collectors were instructed to check the completeness of each questionnaire whether each and every question was completely

answered and also the coordinator was recheck the completeness of the questionnaire immediately after submission

4.12. Data analysis procedures

The questionnaires were checked for completeness by the principal investigator. There was no unfilled and partially filled questionnaire. The questionnaires were coded and then the data was entered into EPI data version 3.1 statistical software package. Then the data was export& analyzed by SPSS soft ware version 21. The descriptive analysis such as frequency distribution, percentages, and measures of central tendency was used. Binary and multiple logistic regression analysis were used to identify the independent predictor of frequent vaginal examination performance. Confidence interval of 95% was also used to see the precision of the study and the level of significance was taken at $\alpha < 0.05$. Final result was presented in text, tables & graphs.

4.13. Ethical consideration

Ethical clearance was obtained from AAU Health Science College, Department Of Nursing and Midwifery Research Ethical Clearance Review Committee. Then formal letter of cooperation was written to Addis Ababa Health Bureau, and selected Addis Ababa public hospitals. Each study participant was adequately informed about the objective, purpose and method of the study by data collectors. Informed consent was obtained from study participants. Confidentiality of information was ensured by removing personal identifiers from the completed questionnaires.

4.14. Dissemination of results

The thesis will be presented to Addis Ababa University department of Nursing and midwifery as partial fulfillment of master degree in maternity and reproductive health nursing. The finding of this study will be disseminated through presentation, publication, and distribution to the MOH, selected hospitals. Hard and soft copy will be made available in the library of AAU (Addis Ababa University), for graduate students as well as for other concerned readers.

5. Result

From the total of 186 labouring mothers the majority of them were in the age group of 26 -30 years 69 (37.1%). Regarding their educational status most of the mothers were secondary level which was 85 (45.7%). In their ethnicity most of them were Amhara 63 (33.9%) and 110 (59.1%) had a religion of Orthodox Christian. Concerning their work condition, marital status and address the majority of them were house wives 95 (51.1%) , married 173 (93.3%) and urban 138 (74.2%) respectively.

Table 1: Distribution of socio-demographic variables of respondents in selected public hospitals, Addis Ababa, Ethiopia, 2015

Variables	Frequency (N)	Percent (%)
Age(years)		
15-20	13	7.0
21-25	63	33.9
26-30	69	37.1
31-35	36	19.4
Above 35	5	2.7
Total	186	100.0
Religion		
Orthodox	110	59.1
Protestant	34	18.3
Muslim	42	22.6
Total	186	100.0
Ethnicity		
Amhara	63	33.9
Oromo	49	26.3
Tigre	31	16.7
Gurage	42	22.6
Others	1	0.5
Total	186	100.0

Educational status		
No education	11	5.9
Primary level	78	41.9
Secondary level	85	45.7
Higher level	12	6.5
Total	186	100.0
Occupation		
House wife	95	51.1
Government employed	47	25.3
Merchant	15	8.1
Private	29	15.6
Total	186	100.0
Address		
Urban	138	74.2
Rural	48	25.8
Total	186	100.0

In this study 186 labouring mothers were selected among the mothers who come to Tikur Anbessa specialized Hospital, Gandhi Memorial Hospital and Tirunesh Beijing General Hospital for delivery service. From the total of 186 labouring mothers 30 (16.1%), 109 (58.6%) and 47(25.3%) were obtained from Tikur Anbessa specialized, Gandhi Memorial and Tirunesh Beijing General hospitals respectively (Table 2).

Table-2: Frequency distribution of hospitals participated in the study, Addis Ababa, Ethiopia,2015

Hospitals	Frequency(N)	Percent (%)
Tikur Anbessa	30	16.1
Gandhi Memorial	109	58.6
Tirunesh Beijing	47	25.3
Total	186	100.0

Among the total of 186 labouring mothers most of them were multipara 104 (55.9%) and for most of laboring mother their gestational age were between 39-42 weeks 114 (61.3%) (Table3).

Table-3: Frequency distribution of obstetric characteristics of laboring mothers in selected public hospitals, Addis Ababa, Ethiopia, 2015

Variables	Frequency(N)	Percent (%)
Gravida		
Primigravida	82	44.1
Multipara	104	55.9
Total	186	100.0
Gestational age		
36 -38	59	31.7
39-42	114	61.3
above 42	13	7.0
Total	186	100.0

Regarding the condition of labour majority of the mothers came with contraction of 3-4 times per ten minute, 3-4 cm cervical dilatation, high station and 70-80% cervical effacement that is 91 (48.9%), 81 (43.5%), 110 (59.1%) and 71 (38.2%) respectively. Most of the mothers were admitted by medical doctors 169 (90.9%).

This study shows that from the total of 186 labouring mothers 158 (84.9%) of them were followed by partograph and 144 (77.4%) their labour onset were spontaneous. The number of VEs performed for each woman ranged from one to seven (mean 2.24, SD 0.67). The majority of them were examined 3-4 times 93 (50.0%) during their labour time.

During vaginal examination only for 59 (31.7%) of the mothers were used antiseptic solution to clean the vulva and 3-4 health care providers 146 (78.5%) were mostly conduct the examination. The work experience and educational level of most health care providers were two years' service 122 (65.6%) and had degree 135 (72.6%) respectively. The labour duration for most of the mothers were between 3-4 hrs and 5-6 hrs that is 40 (21.5%) for both (table4).

Table-4: Frequency distribution of characteristics of vaginal examination for labouring mothers in selected public hospitals, Addis Ababa, Ethiopia, 2015

Variables	Frequency(N)	Percent (%)
Contraction(N ₀)		
No	40	21.5
1-2	54	29.0
3-4	91	48.9
5-6	1	5
Total	186	100.0
Cervical dilatation(cm)		
Closed	38	20.4
3-4	81	43.5
5-6	39	21.0
7-8	20	10.8
9-10	8	4.3
Total	186	100.0

Station		
High	110	59.1
Zero	18	9.7
+1	31	16.7
+2	27	14.5
Total	186	100.0
Effacement (%)		
No	36	19.4
30-40	11	5.9
50-60	44	23.7
70-80	71	38.2
90-100	24	12.9
Total	186	100.0
Who admit the mothers		
Midwife	16	8.6
Doctor	169	90.9
Nurse	1	5
Total	186	100.0
Use of partograph		
Yes	158	84.9
No	28	15.1
Total	186	100.0
Number of health care providers		
One	16	8.6
two–three	146	78.5
four-seven	24	12.9

Total	186	100.0
Work experience of health workers(Yrs)		
1	19	10.2
2	122	65.6
3-5	45	24.2
Total	186	100.0
Educational level of health workers		
Diploma	39	21.0
Degree	135	72.6
Other(gynecologist)	12	6.5
Total	186	100.0

Pie chart

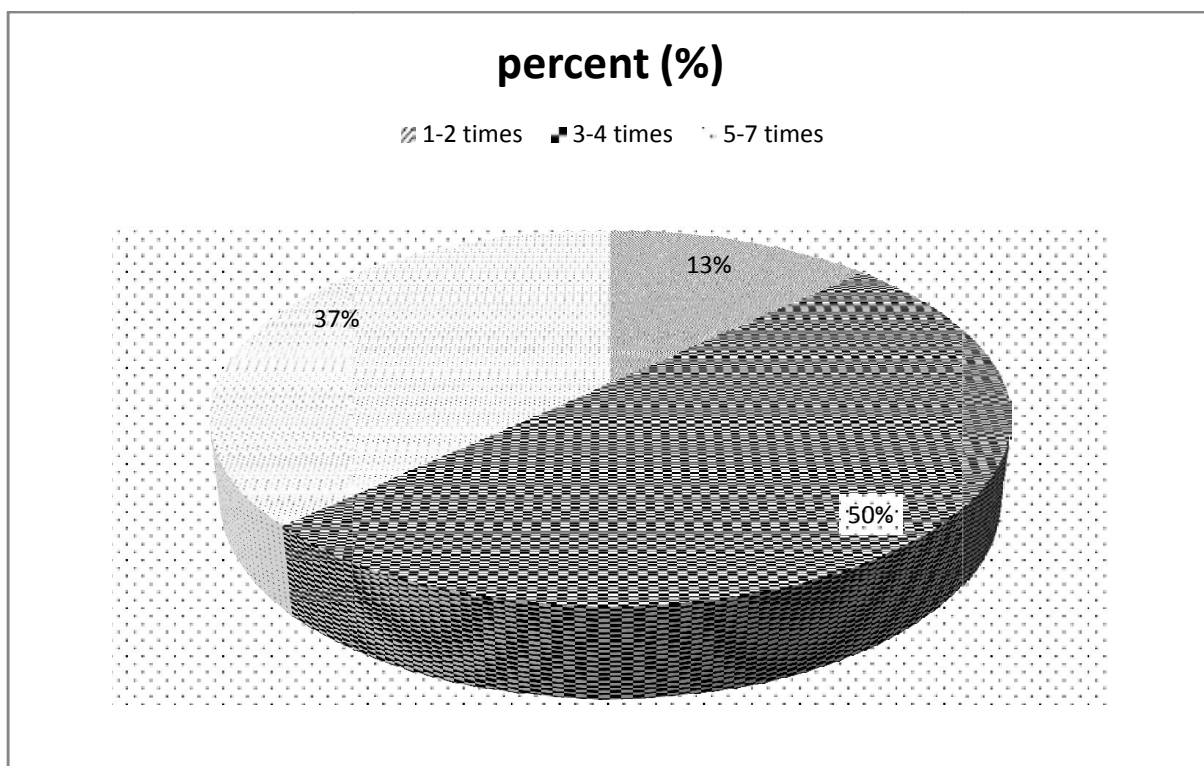


Fig-3: Pie chart number of vaginal examination performed by health care providers during normal labour in selected public hospitals, Addis Ababa Ethiopia, 2015

Table-5: Binary and multiple logistic regression analysis of variables with frequency of vaginal examination during normal labour in selected public hospital, Addis Ababa, Ethiopia, 2015

No	Variables	Frequency of vaginal examination		COR (95% CI)	AOR (95% CI)
		Correct N(%)	Incorrect N(%)		
1	Age				
	15-20	4(3.4)	9(13.0)	0.563(0.047,6.769)*	0.173(0.007,4.223)
	21-25	37(31.6)	26(37.7)	0.176(0.019,1.663)*	0.036(0.002,0.618)
	26-30	46(39.3)	23(33.3)	0.125(0.013,1.183)*	0.074(0.005,1.158)
	31-35	29(24.8)	7(10.0)	0.060(0.006,0.627)*	0.034(0.002,0.611)
	Above 35	1(0.9)	4(5.8)	1	1
2	Effacement (%)				
	No	21(17.9)	15(21.7)	5.000(1.259,19.860)*	2.821(0.4484,16,434)
	30-40	6(5.13)	5(7.24)	5.833(1.071,31.762)*	6.102(0.539,69,095)
	50-60	25(21.4)	19(27.5)	5.320(1.381,20.497)*	3.475(0.699,17,266)
	70-80	44(37.6)	27(39.1)	4.295(1.169,15.779)*	3.587(0.743,17.308)
	90-100	21(17.9)	3(39.1)	1	1
3	Gravid				
	primigravida	38(32.5)	44(63.8)	3.659(1.958,6.836)*	8.820(3.242,23.997)**
	Multiparaous	79(67.5)	25(36.2)	1	1
4	No of health care providers				
	1	11(17.9)	5(7.3)	0.091(0.020,0.410)*	0.043(0.006,0.330)**
	2-3	102(87.2)	44(63.8)	0.086(0.028,0.267)*	0.102(0.027,0.386)**
	4-7	21(17.9)	20(34.8)	1	1
5	Work experience of health workers				
	1 year	15(12.8)	4(5.8)	0.233(0.067,0.813)*	0.120(0.018,0.810)**
	2 years	81(69.2)	41(59.4)	0.443(0.221,0.888)*	0.298(0.113,0.790)**

6	Duration of labour				
	1-2	2(17.9)	8(11.6)	0.069(0.012,0.384)*	0.020(0.002,0.199)**
	3-4	29(24.8)	11(15.9)	0.069(0.013,0.362)*	0.014(0.002,0.121)**
	5-6	26(22.2)	14(20.3)	0.098(0.019,0.505)*	0.026(0.003,0.218)**
	7-8	23(19.7)	13(18.8)	0.103(0.020,0.537)*	0.014(0.002,0.123)**
	9-10	10(8.6)	7(10.1)	0.127(0.021,0.762)*	0.014(0.001,0.174)**
	11-12	6(5.1)	5(7.3)	0.157(0.022,1.031)*	0.033(0.003,0.363)**
	Above 12	7(1.7)	11(15.9)	1	1

* Statistically significant at P <0.2

** Adjusted for gravida, number of health workers, work experience of health care providers, and duration of labour.

In the bivariate analysis the factors that have found to have an association with frequency of vaginal examination were gravidity, number of health care providers, work experience of health care providers & duration of labour with p-value < 0.05. The variables were potentially predictor for frequency of vaginal examination in the multivariate logistic regression model.

In the multivariate analysis gravidity, number of health care providers, work experience of health care providers and duration of labour had an association with frequency of vaginal examination at p- value of < 0.2.

Primigravida were 8.820 times more likely had frequent vaginal examination than multiparaous women (AOR 8.822; 95% CI [3.242, 23.997]).

One health care provider and two-three health care providers were 0.043 and 0.102 times less likely had frequent vaginal examination than four to seven health care providers (AOR 0.043; 95% CI[0.006,0.330], AOR 0.102; 95% CI [0.027,0.386]) respectively.

One year and two years work experience of health care providers were 0.120 and 0.298 times less likely had frequent vaginal examination than three to five years work experience (AOR 0.120; 95% CI [0.018, 0.810], AOR 0.298; 95% CI [0.113,0.790]) respectively.

Duration of labour 1-2hrs, 3-4hrs, 5-6hrs, 7-8hrs, 9-10hrs, 11-12hrs were 0.020,0.014,0.026,0.014,0.014 and 0.033 times less likely had frequent vaginal examination than above 12 hrs (AOR0.020; 95% CI [0.002,0.199], AOR 0.014; 95% CI [0.002,0.121], AOR 0.026; 95% CI[0.003,0.218], AOR 0.014; 95% CI [0.002,0.123], AOR 0.014 95% CI [0.001,0.174]and AOR 0.033; 95% CI [0.003,0.363])respectively (table 5).

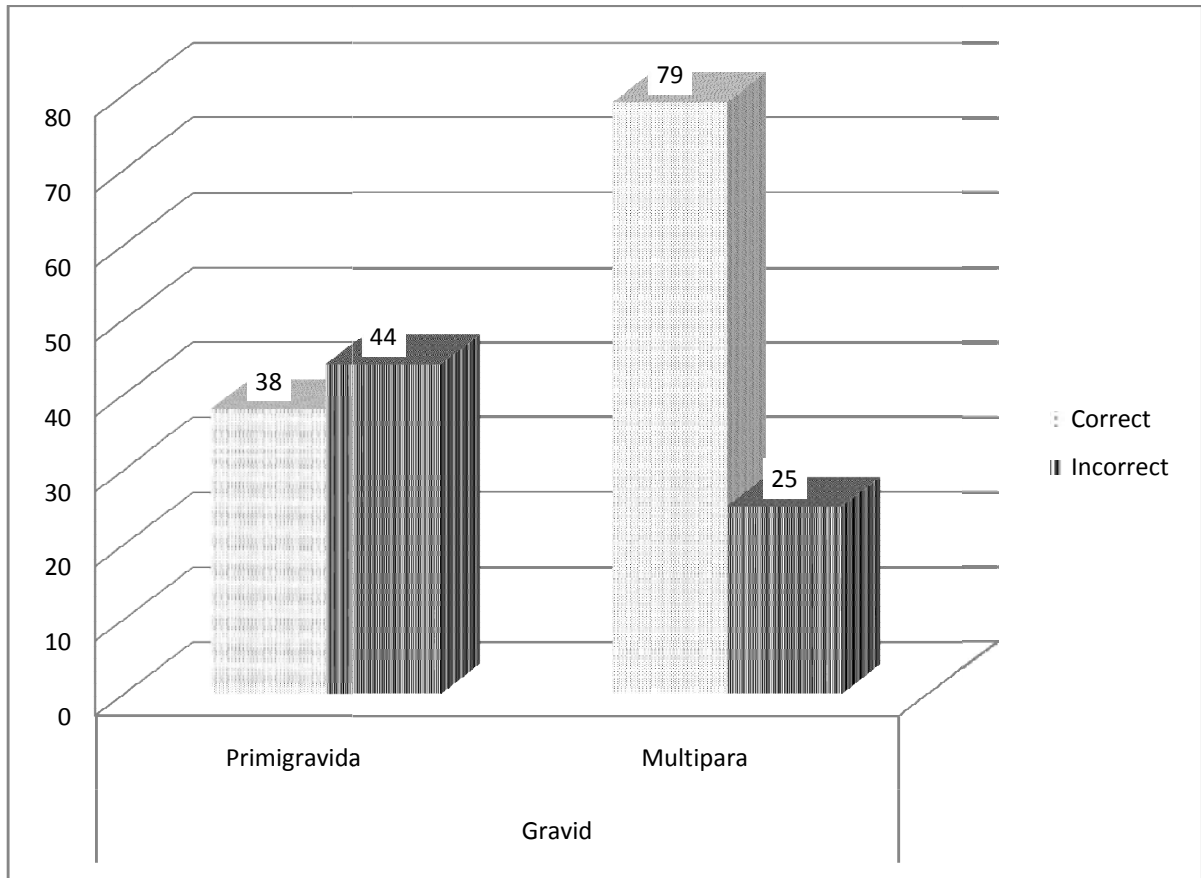


Fig-4: Frequency distribution of gravida of the mothers with number of vaginal examination during normal labour in selected public hospitals Addis Ababa, Ethiopia, 2015

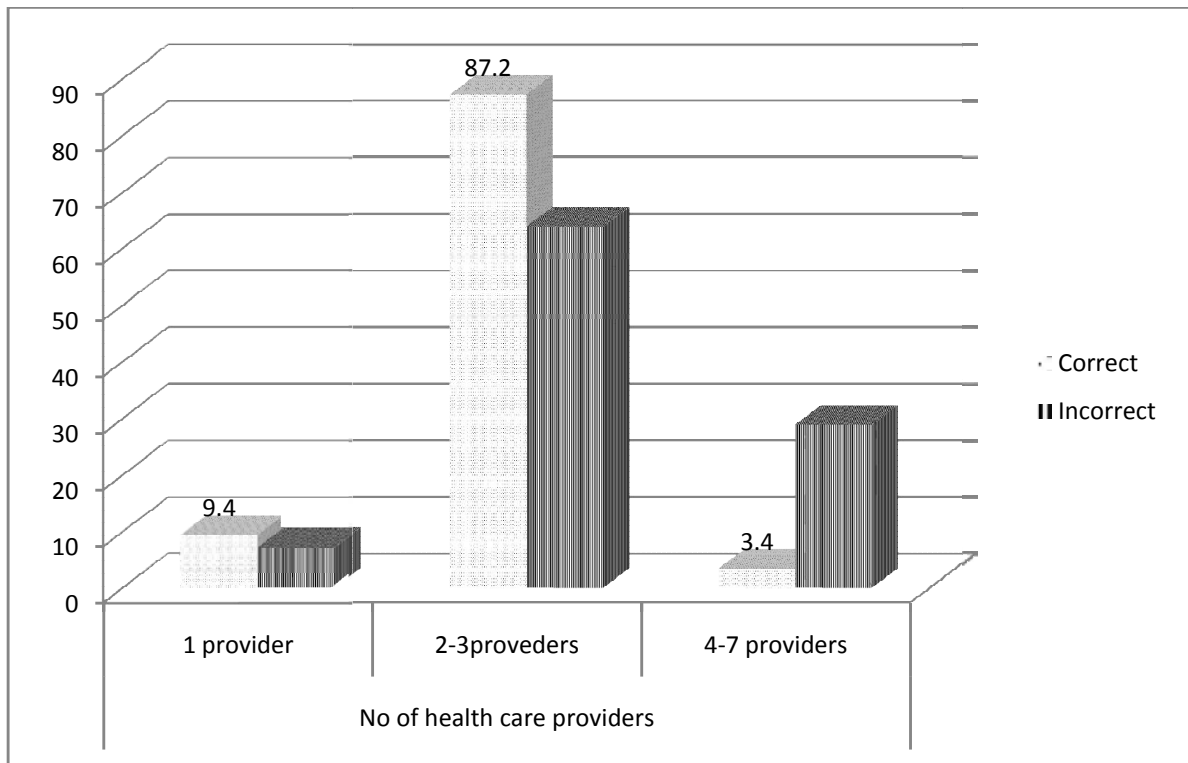


Fig-5: Frequency distribution of number of health care providers who conduct vaginal examination with the number of vaginal examination during normal labour in selected public hospitals Addis Ababa, Ethiopia, 2015

Table-6: Frequency distribution of work experience of health care providers with the number of vaginal examination during normal labour in selected public hospital Addis Ababa, Ethiopia, 2015

Variables	work experience of the health care providers			Total
	1 year	2 years	3-5 years	
Correct	15	81	21	117
Incorrect	4	41	24	69
Total	19	122	45	186

Concerning the reason given by health care provider for performing vaginal examination majority of them said that vaginal examination was performed to check the onset of labour, to check the progress of labour, after rupture of membrane and to see second stage of labour (table7).

Table-7: Frequency distribution of reasons given by health care providers for the 2nd vaginal examination during normal labour in selected public hospitals Addis Ababa, Ethiopia, 2015

Reason for 2nd vaginal examination	Frequency	Valid Percent
To see the progress of labour	142	76.3
After rupture of membrane	3	1.6
Due to mothers complain	1	.5
To start induction	13	7.0
To start augmentation	13	7.0
After fetal distress	3	1.6
To give analgesics	1	.5
To check second stage of labour	10	5.4
Total	186	100.0

6. Discussion

In this study the majority of the respondents were in the age group of 26-30 which was 69 (37.1%) or the median age was (32 years) which is somewhat the same as the study done in Scotland hospital that was 30 years (14). More frequent vaginal examination was performed in the age group of 21-25 years 26 (37.68%). This might be due to they are more complaining the pain than older age. It is less when compared to the study done on 176 Palestinian women's which were 48 (76%) (10). On study done in Cambridge shire, England more frequent vaginal examination was performed in the younger age group 16-30 years (17). The difference might be in Palestinian study the age was categorizing in to two parts, but in this study it was classified in to five categories. Logistic regression analysis shows socio demographic factors had no significant association with number of vaginal examination; it is the same as the study done on Palestinian women (10). On the educational status majority of the participants in this study were secondary levels which was 85 (45.7%). This may be due to more of the participants came from urban area which have high educational coverage and it is less when compared to educational status of the study done on Palestinian women which was from 10-17 years 119(68%) (10), this might be due to their high educational coverage. In this study most of the mothers came from urban area 138 (74.2%), when compared to the other study which was done on Palestinian women, 132 (75%) was came from rural area (10). This is because this study was done in Addis Ababa which is the capital city of Ethiopia. Most of our respondents were house wife 95(51.1%) and Orthodox Christian 110 (59.1), this might be due to socio demographic distribution.

In this study most of the participants were multiparaous 104 (55.91%) which is less when compared with the other study done on Palestinian women 130 (79%) (10). But study done in Scotland indicates that majority of the participants were primiparous 83 (53%) (14). This difference might be due to multiparaous have more family planning service than primiparous there. Also gravidity of the mothers had a significant association with the frequency of vaginal examination. More frequent vaginal examination is performed for primigravidas 44 (63.77%) than multiparaous women 25 (37.68%). This might be due to primigravida had more labour duration than multiparaous and complaining more pain

It was different when compared to the study done on Palestinian women, for primigravida 22(35%) and multiparaous 41(65%). As seen by this study logistic regression analysis indicates

primigravidas were 8.820 times more likely had frequent vaginal examination than multiparaous (AOR 8.820; 95% CI [3.242, 23.997]). It is similar to study done on Palestinian women (10). The median of gestational age in this study is the same as the study done in Scotland that is 40 weeks of gestation (14).

Status of labour during admission have no significant association with frequency of vaginal examination as seen by logistic regression, for women with contraction 3-4times per ten minute and cervical dilatation 7-8 cm, the number of vaginal examination performed was 16 (80%) and 63 (69.23%) respectively. This is due to the women's have less labour duration when compared to less number of contractions and decreased cervical dilatation. Most of the admission of the mothers took place by medical doctors 169 (90.9%) in this study, which is different from the study done on Palestinian women which was admitted by midwife 138 (79%) (10). This difference might be due to the hospitals that are selected for these studies were teaching hospitals where more number of medical doctors were available.

In this study partograph were used for 158 (84.9%) of women. Partograph usage had no significant association with frequency of vaginal examination because most of the time health care providers did not properly record the information according to the guide line, that was they performed frequent vaginal examination but they did not record it on partograph, it was the same as the study done in Addis Ababa public hospitals in 2012 on completion of modified WHO partograph(19). This might be due to negligence and not thinking about the complication that happens to the mothers. The majority of the respondents were not using antiseptic solution to clean the genital area during vaginal examination 127 (68.3%). It is different when we compare with other study done on Audit of use of tap water for vulval and perineal cleansing in 1998 which showed the majority of staff were using tap water for vaginal examinations 90% (n=52), and normal deliveries 84% (n=49). This might be due to negligence of health care providers and malpractice which his possibly aggravates the development of ascending infection in addition to repeated vaginal examination.

Of those 42 (22.58%) mothers admitted for induction of labour, 20 (47.62%) of them had more frequent vaginal examination than 144 (77.4%) of mothers admitted in spontaneous labour which was 49 (34.02%), when compared to study done in Scotland mother admitted in spontaneous

labour had more frequent vaginal examination than induced labour(14). This difference might be due to improper use of partograph or the guide line of induction of labour in this study.

This study shows majority of the mothers had frequent vaginal examination from 3- 4 times 93(50.0%) during labour time, range of the examination was from 1-7 times. This is less when compared to the study done by Berg storm et al in 1992,that ranges varies between 2-17 times during labour time, study done in Scotland also showed that it ranges from 1-15 times. And also the study done in large academic center by busy midwives indicated that on average women's underwent 4 vaginal examinations during labour time (14, 15 and 17). This may be due to improper use of partograph and high number of health care providers.

In this study, 146 (78.5%) of vaginal examination were conducted by 2-3 numbers of health care providers; it is similar in number of health care providers who conduct the examination to the study done on Palestinian women from 2-3 health care providers 125(71 %) (10). The number of health care provider had a significant relationship with the number of vaginal examination, when the number of health care providers increased frequency of vaginal examination also increased. The increment in number of health care provider was found to have a contribution in leading to incorrect vaginal examination , that was when the number of health care providers was four to seven, 20 (83.33%) of them had incorrect vaginal examination. It was high when compared to the study done on Palestinian women, three to seven 49 (78%) had incorrect frequency of vaginal examination (10). The high number of health care providers was related with teaching hospitals, due to loss of trust on the other health care providers who conduct initially, due to length of labour. The association of number of health care providers with frequency of vaginal examination have analyzed by logistic regression one health care provider and two-three health care providers 0.043 and 0.102 times less likely have frequent vaginal examination than four- seven health care providers(AOR 0.045; 95% CI [0.006,0.314], AOR 0.082; 95% CI [0.022,0.308]) respectively. It is the same as study done on Palestinian women which indicates there was an association between number of health care providers and vaginal examination (14).This is because if there are high numbers of health care providers all of them want to check the condition by themselves rather than trusting the other who performed vaginal examination initially.

Out of health care providers who have 3-5 years work experience 24 (53.33%) of them were conducted frequent vaginal examination. Work experience had significant association with number of vaginal examination by logistic regression analysis. work experience of one and two years have 0.120 and 0.298 times less vaginal examination than work experience of three to five (AOR 0.120; 95% CI [0.018, 0.810]) and (AOR 0.298; 95% CI [0.113, 0.790]).This might be from adaptation of the risk or complication and due to giving little attention to women's distress. Their educational levels have no significant association with frequency of vaginal examination.

Duration of labour had a significant association with frequency of vaginal examination, out of mother's who had labour duration more than 12 hrs 11 (84.62%) of them had more vaginal examination than WHO recommendation that is 1 in every 4 hrs.(14). It is more when compared to the study done in Scotland almost 99 (70 %) had more vaginal examination than expected. (14). In the other hand, labour duration from 1-2 hrs 0.020 times less likely have frequent vaginal examination than labour duration more than 12hrs(AOR 0.020; 95% CI [0.002,0.199].This might be due to increased number of health care providers, mothers complain and intervention to shorten the labour duration in relation to length of labour.

In this study the common reasons given by health care providers for performing vaginal examination was, to check the progress of labour and to assess the onset of labour, the other reasons was after rupture of membrane, after mothers complain and to check second stage of labour. This is almost the same reasons which was given on the other studies, on study done by Berg storm et al in 1992 the most reason given by midwife was to assess the progress and commencement of labour(17),and the study done in Scotland showed that the main reason for performing vaginal examination was to assess the progress of labour(51%) and the next reason was to assess onset of labour(29%). Only 20% of vaginal examinations performed for other reasons including prior to induction or analgesia (2, 14).This indicates that even though the reasons given by health care providers to perform vaginal examination were acceptable it was not performed according to the protocols.

7. Strength and limitation of the study

7.1 Strength

The questioners were used to collect the data. The questioners were pretested before main study was conducted. Before data collection was started training was given for data collectors and coordinators on how to administer the questioners and supervised. The daily data collection activity was monitored and daily supervised by principal investigator & supervisors

7.2 Limitation

Sampling procedure used for this study was convenience, the sample was also taken from selected governmental hospitals, sample size did not calculated before study was conducted, so this can limit generalization for the whole population, and there was also small sample size. Since I was asking for frequency of vaginal examination during normal labour one health care provider were asked for many times so it makes them exhausted. There is no study done in our country on this topic and also limited literatures were found which most of them had long duration.

8. Conclusion and recommendation

8.1. Conclusion

Most of the mothers had more frequent vaginal examination due to high number of health care providers who conduct vaginal examination for one labouring mother in teaching hospitals and due to length of labour. Even though partograph utilization was high, health care providers were not using it according to the guidelines. As we know antiseptic solution used for cleaning the genital area will decrease ascending infection but the health care providers were not using antiseptic solution to clean the genital area which can increase the risk of puerperal sepsis. The most common reason given by health care providers for conducting vaginal examination was to check the onset of labour& progress of labour.

8.2. Recommendation

- ✓ The health care providers should follow the guidelines for performing vaginal examination
- ✓ Even though vaginal examination is mandatory for labouring mothers, teaching hospitals should decrease the number of vaginal examination by decreasing the number of health care providers who conduct vaginal examination.
- ✓ The health care providers who performed vaginal examination should use antiseptic solution for cleaning the genital area to decrease ascending infection.
- ✓ Even though the reasons given by health care providers were reasonable they should conduct vaginal examination only when necessary.
- ✓ The hospitals should have monitor the performance of their health care providers on proper use of partograph and give training on partograph for those who are not using according to the protocol by cooperating with stakeholders.
- ✓ Ministry of Health should gives attention on frequency of vaginal examination performed by health care providers as a standard and do follow up.
- ✓ Further research should be done on the outcome of frequent vaginal examination and qualitative research.

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Annexes

1. Data collection tools

I. Information sheet:

Good morning, Good afternoon, good evening [According to its convenience]. My name is -----
----- I came from Addis Ababa University, Department of nursing and midwifery. I am here to gather information about reasons and frequency of vaginal examination during normal labour, so I want to ask you some questions. Would you mind if I take some time with you? Your name will not be included in the information, I promise to keep the confidentiality of your reply, you have the right to stop filling of the question if don't want to do so. Though it seems long time the study helps to improve the sub standard care given for the mothers during labour. As a result, I kindly request you to participate in the study genuinely answering the questions.

I agree to participate----- I don't agree to participate.....

II. Consent form:

I have been briefly informed about the study and I clearly understood the objective. Since it doesn't affect my personal life, I don't need any remedy. Consequently, I here approve my consent to take part in the study as an interviewee with my signature.

Signature-----

Date-----

2. Questionnaire

Part one demographic characteristic of women

Mark sign on the answer from the provided alternative

1. Age of the mother by year

15-20 21-25 26-30 31-35 Above 35

2. Level of education of the mother

1-4 5-8 9-12 Higher level No education

3. Ethnicity

Amhara Oromo Tigre Gurage Other

4. Religion

Orthodox Protestant Muslim Other

5. Work condition

House wife Government worker Merchant Private

6. Marital status

Married Unmarried widowed Divorce

7. Address

Urban Rural Camp

Part two obstetric characteristics of women

1. Gravida

Primigravida Multipara

2. Gestational age

36 -38 39-42 above 42

Part three characteristics of vaginal examination

1. Time of admission-----
2. Condition on admission
 - Contraction
 No one to two 3 -4 5 -6 above 6
 - Cervical dilatation-----
 Closed 3 -4 cm 5-6 cm 7-8 cm 9 -10 cm
 - Station-----
 High zero plus one plus two above two
 - Effacement-----
 No 30 -40 % 50 – 60 % 70 -80 % 90 -100 %
3. Who admit the mother
 Midwife doctor nurse student
4. Do you use partograph
 Yes No
5. What is the labour condition or onset of labour
 Spontaneous induced
6. How many times dose vaginal examination performed for the mother
 1-2 3-4 5-7 8-12
7. Dose they use antiseptic solution during each vaginal examination
 Yes No
8. How many health care providers conduct vaginal examination
 One two – three four- seven above seven
9. What was the work experience of the health care provider in labour ward
 One two three-five above five
10. Educational level of health care provider
 Diploma degree other

Part four concerns on reasons given by health care providers for performing vaginal examination

1. Why do you perform vaginal examination

The 1st examination -----

The 2nd examination-----

The 3rd examination-----

The 4th examination-----

The 5th examination-----

The 6th examination-----

The 7th examination-----

2. What was the time of delivery _____

3. Declaration of the principal investigator

I, the undersigned, declare that, this thesis is my original work, has never been presented in this or other university, and all resources and materials used herein have been duly acknowledged.

Name: Aberash Eifa

Signature _____

Date of submission _____

Place: Addis Ababa

This thesis has been submitted for examination with my approval as a university advisor.

Name: Sr Yemesirach Kalku

Signature: _____

Date _____