



PARTOGRAPH UTILIZATION AND ASSOCIATED FACTORS
AMONG OBSTIETRIC CARE PROVIDERS AT PUBLIC
HEALTH FACILITIES IN HADIYA ZONE, SOUTHERN
ETHIOPIA

BY: - YOSEF HAILE (BSc)

A THESIS TO BE SUBMITTED TO JIMMA UNIVERSITY, INSTITUTE OF
HEALTH, DEPARTMENT OF HEALTH POLICY AND MANAGEMENT IN
PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF
MASTER OF PUBLIC HEALTH IN HEALTH SERVICES MANAGEMENT

JUNE, 2019

JIMMA, ETHIOPIA

PARTOGRAPH UTILIZATION AND ASSOCIATED FACTORS
AMONG OBSTETRIC CARE PROVIDERS AT PUBLIC HEALTH
FACILITIES IN HADIYA ZONE, SOUTHERN ETHIOPIA

INVESTIGATOR: - YOSEF HAILE (BSc)

ADVISORS: -

1. FIKRU TEFESA (MPH, ASSISTANT PROFESSOR)
2. TESHAYE DAGNE (BSc, MPH)

JUNE, 2019

JIMMA, ETHIOPIA

ABSTRACT

Background: Even though partograph has great importance on reducing maternal and neonatal mortality due to prolonged and obstructed labor, it is not widely used in many countries. Finding of the studies conducted in Ethiopia filled the gap related with factors affecting partograph utilization among respondents but some factors such as pre service training on partograph and level of education were not studied well in our country.

Objective: To determine the level of partograph utilization and associated factors among obstetric care providers at public health facilities in Hadiya Zone, Southern Ethiopia, 2019.

Methods: Facility based cross sectional study was employed from March 04- April 07, 2019. Single population proportion formula was used to estimate the sample size and it was 436. Simple random sampling method was carried out to select 19 health facilities and 436 participants at the primary level and at the secondary level respectively. Data was collected by six trained data collectors and entered into Epidata version 3.1 statistical packages and exported to SPSS version 20.0 for analysis. Binary logistic regression analysis was used to see the association between variables. The lack of fitness of the regression model was tested using the Hosmer-Lemeshow goodness of fit. Independent variables with a p-value of less than 0.25 at the bivariate analysis were entered into the multivariable logistic regression model.

Results: The overall magnitude of partograph utilization was found to be 54.4%.and finding from data abstraction from document revealed that out of 18 parameters only 10 parameters were recorded completely. Type of health facility (hospital as compared to HC) (AOR=2.96, CI= (1.71, 5.12)), received on job training on partograph (AOR=7.06, CI= (4.3, 11.37)), knowledgeable about partograph (AOR=2.12 CI=1.3, 3.9)) and favorable attitude toward partograph use (AOR=1.8, CI=1.12-2.97) were significantly associated with partograph use

Conclusion and Recommendation: Over all partograph utilization was low and incomplete recording of required parameters on partograph was observed in this study. Participants who received on job training on partograph, who are working in hospital, knowledgeable about partograph and who have favorable attitude toward partograph use were factors affecting partograph use positively. On job training on partograph and working to improve knowledge and attitude of the obstetric care providers toward partograph utilization were recommended.

ACKNOWLEDGMENTS

First, I would like to express my deepest gratitude to Jimma University, Institute of Health, Department of Health Policy and Services Management for providing me the opportunity to this work. Secondly, I would like to extend my deepest appreciation to my advisors Mr Fikru Tafese and Mr Tesfaye Dagne, from the Department of Health Policy and Services Management for their valuable advice and comments they have provided during the development of the proposal and thesis.

Lastly, I would like to express my deepest gratitude to staff of Hadiya Zone Health Department, District Health Offices, Data Collectors and Supervisors, Study Participants and My Friends for their nice support in this work.

LIST OF TABLES

Table 1: The resultant sample size determination for the second specific objective	12
Table 2: Socio-demographic characteristics of respondents in Hadiya Zone, SNNPR Ethiopia.	19
Table 3: Professional Characteristics of Obstetric Care Providers in Hadiya Zone, 2019 (n = 399).	21
Table 4: Parameters recorded by obstetric health providers in partograph while attending labour in selected health institution of Hadiya Zone, SNNPR Ethiopia, 2019 (n=65)	23
Table 5: Results of bivariate analyses for factors associated with partograph utilization among obstetric care providers, Southern Ethiopia, July, 2019(n=399).	26
Table 6: Results of multivariable analyses for factors associated with partograph utilization among obstetric care providers, Southern Ethiopia, July, 2019(n=399)	28

LISTOFFIGURES

Figure1: Conceptual framework of partograph utilization and associated factors	8
Figure2: Schematic presentation of sampling procedure, Hadiya zone, southern Ethiopia, 2019.	14
Figure3: Reasons for not using the partograph by obstetric care providers of public health institution in Hadiya Zone, SNNPR Ethiopia; 2019	25

LIST OF ABBREVIATIONS AND ACRONYM

ANC.....Antenatal Care

AOR.....Adjusted Odds Ratio

BEMOC...Basic Emergency Obstetric Care

BSc.....Bachelor Science

CEMOC...Comprehensive Emergency Obstetric Care

CI.....Confidence Interval

COR.....Crude Odds Ratio

EDHS..... Ethiopian Demographic Health Survey

FPFamily Planning

GP.....General Practitioner

HEW.....Health Extension Worker

HO..... Health Officer

IRB Institutional Review Board

MD..... Medical Doctors

NGO..... Non-Governmental Organization

PHF..... Public Health Facilities

SNNPR..... South Nation's Nationality and People Region

SPSS Statistical Package for Social Studies

WHO..... World Health Organization

TABLE OF CONTENTS

ABSTRACT	i
ACKNOWLEDGMENTS	ii
LIST OF TABLES	iii
LISTOFFIGURES	iv
LIST OF ABBREVIATIONS AND ACRONYM	v
TABLE OF CONTENTS	vi
CHAPTER ONE: INTRODUCTION	1
1.1 Background	1
1.2 Statement of the Problem	2
1.3 Significance of the Study	3
CHAPTER TWO: LITERATURE REVIEW	4
2.1 The Importance of Partograph	4
2.2 Magnitude of Partograph Utilization	4
2.3 Factors Associated with Utilization of Partograph	5
2.3.1 Socio Demographic Factors.....	5
2.3.2 Knowledge about Partograph and Utilization of Partograph.....	5
2.3.3 Attitude of Obstetric Care Providers toward Partograph	6
2.3.4 Professional Characteristics of Obstetric Care Providers.....	7
2.3.5 Conceptual Frameworks of Partograph Utilization	7
CHAPTER THREE: OBJECTIVES	8
3.1 General Objective	9
3.2 Specific Objectives	9
CHAPTER FOUR: METHODS AND MATERIALS	10
4.1 Study Area and Period	10
4.2 Study Design	10
4.3 Population	10
4.3.1 Source Population	10
4.3.2 Study Population	10
4.3.3 Inclusion and Exclusion Criteria	10
4.4 Sample Size Determination and Sampling Procedure	11

4.4.1 Sample Size Determination	11
4.4.2 Sampling Procedure.....	13
4.5 Data Collection Tools and Procedures.....	15
4.5.1 Data Collection Tools.....	15
4.5.2 Data Collection Method.....	15
4.6 Study Variables	15
4.6.1 Dependent Variable	15
4.6.2 Independent Variables.....	15
4.7 Operational Definition.....	16
4.8 Data Quality Assurance.....	17
4.9 Data Processing and Analysis	17
4.10 Ethical Consideration	17
4.11Result Dissemination Plan.....	18
CHAPTER FIVE: RESULTS.....	19
5.1 Socio-Demographic Characteristics of Study Participants.....	19
5.2 Professional Characteristics of Obstetric Care Providers	20
5.3Knowledge of Obstetric Care Providers about Partograph.....	21
5.4Attitude of Obstetric Care Providers toward Partograph Utilization	22
5.5Partograph Utilization.....	22
5.6 Reasons for Not Using the Partograph	25
5.7Factors Associated with Partograph Utilization by Obstetric Care Providers	25
5.7.1 Results of Bivariate Logistic Analysis for Factors Associated with Partograph Utilization	25
5.7.2 Results of Multivariable Logistic Analysis for Factors Associated with Partograph Utilization.....	27
CHAPTER SIX: DISCUSSION.....	29
CHAPTER SEVEN: CONCLUSION AND RECOMMENDATION	32
7.1 CONCLUSION	32
7.2 RECOMMENDATION.....	32
REFERENCES.....	33
ANNEX	37

CHAPTER ONE: INTRODUCTION

1.1 Background

Partograph is graphic representation of labor which is used by health professionals for monitoring labor progress, fetal and maternal wellbeing (1). The main aim of using it is to prevent prolonged and obstructed labor which are the major causes of maternal and prenatal mortality and morbidity in developing countries (2,3).

Friedman (1954) was the first obstetrician to graphically identify four phases of cervical dilation, in a study of 100 women in their first pregnancy. His graphic recordings of labor progression became known as a cervicograph. In 1972, Philpott and Castle expanded on this cervicograph by including other intrapartum information, such as the relationship to the presenting part and uterine contractions, producing the first partograph. Then they introduced action and alert lines, in an effort to manage labor in the best possible way in a setting where doctors were generally unavailable. Years later, during the 1987 Safe Motherhood Conference in Nairobi, Kenya, the World Health Organization (WHO) revised, approved, and promoted the universal use of the partograph with a view toward reducing maternal and fetal mortality (4,5).

Partograph consists of three components, maternal & fetal condition as well as progress of labor. It involves various parameters to assess progress of labor and maternal and fetal conditions during labor. The progress of labor is assessed through cervical dilatation and descent of the head and uterine contractions. On the other hand, fetal condition is monitored by fetal heart rate, color of liquor, and the molding of the fetal skull. Furthermore, the maternal condition is also assessed through monitoring maternal pulse rate, blood pressure, temperature and urine for volume, protein, and ketone bodies and additional crucial factor in active management of labor is the timing of interventions as and when needed, such as augmentation with oxytocin, caesarean section, or transfer to a higher center(2,6).

When partograph is used effectively, it prevents obstructed labor, which accounts for about 8% of maternal deaths worldwide and 13% maternal deaths in Ethiopia. It serves as an 'early warning system' (3,4,7). Thus, timely detection of abnormal progress of labor by routine use of partograph significantly reduce the complications of prolonged and obstructed labor such as, sepsis, uterine rupture and postpartum hemorrhage and thereby reduce the maternal mortality (2).

1.2 Statement of the Problem

Even though maternal death is decreasing in the world, still it is the main health problem of low income countries. These countries account the vast majority of total maternal death; from these more than one third of global maternal death occurred in sub-Saharan Africa alone which become 546 per 100,000 live births. In Ethiopia, maternal death is still high. According to EDHS 2016, it is estimated 412 per 100,000 live births. However, majority of deaths can be prevented with simple and cost effective interventions like using partograph during labor and delivery (3,8).

Prolonged and obstructed labor are the most common causes of maternal and neonatal illness and death in developing countries because of inadequacy and poor quality of obstetric care including poor utilization of partograph in monitoring of labor. The women who experiences obstructed labor usually suffer from postpartum hemorrhage, uterine rupture, puerperal sepsis and obstetric fistula. Furthermore, it is highly associated with birth trauma, birth asphyxia, stillbirths, neonatal sepsis, and neonatal deaths(3,7,9,10).

It is one of the common easily preventable causes of maternal and prenatal morbidity and mortality in developing countries including Ethiopia. Thus; prevention of prolonged and obstructed labor by using simple and inexpensive tool known as partograph is a key intervention for reduction of maternal and prenatal morbidity and mortality(5,11).

To reduce maternal and neonatal morbidity and mortality due to obstructed and prolonged labor especially in developing countries World Health Organization (WHO) recommends universal and routine partograph utilization. Studies have shown that using the partograph to monitor labor can be highly effective in reducing complications from prolonged and obstructed labor for the mother and newborn (9,12).

Despite its great importance on reducing maternal and neonatal mortality due to prolonged and obstructed labor, it is not widely used in many countries (6,11) Studies from some developing countries has shown that the utilization of partograph is poor despite preparing the tool that is simple and inexpensive for intra partum monitoring of labor (4,13–15). Likewise, some studies in Ethiopia reported low utilization of the partograph (16–18).

Lack of preprinted partograph charts in the public health facilities, poor knowledge and unfavorable attitude toward partograph utilization were identified as factors affecting routine use

of partograph during labor (18–20). Providing preprinted partograph for all health facilities, local supervision, increasing the number of health workers in the maternity unit to the standard level to decrease the work load and motivating health workers were identified as a solution to solve problems related to the use of partograph (19,21,22).

Finding of the studies conducted in Ethiopia filled the gap related with factors affecting partograph utilization such as type of profession, training about partograph and the above listed factors among obstetric care providers but some factors such as pre service training on partograph and level of education were not studied well in our country. Understanding this will help to improve the quality of intrapartum care in all health facilities.

Therefore, the aim of this study is to determine the magnitude of partograph use and identify the factors associated with its use among obstetric care providers at public health facilities in Hadiya zone, Southern Ethiopia.

1.3 Significance of the Study

The finding of this study will help to inform Hadiya Zone Health Department, public health facilities, obstetric care providers participating in this study and other stakeholders about the magnitude of partograph utilization and barriers that affect partograph use. It delivers ways of improving partograph utilization for improvement of maternal and fetal outcomes. The findings of this study also will be used as an input for the policy makers in the maternal and child health department of health sector to improve maternal and neonatal outcomes.

Lastly, the obstetric care providers or health care staff will be more prepared to effectively monitor the health of mother and baby.

CHAPTER TWO: LITERATURE REVIEW

2.1 The Importance of Partograph

The partograph facilitates the tracking of maternal condition, fetal condition, and cervical dilation versus time during labor. Apart from reducing the maternal and prenatal mortality and morbidity, it will also increase the quality and regularity of all observations on the fetus and the mother in labour and aids early recognition of problems. Introduction of partograph at the maternity and health centers in developing countries is urgently needed to reduce the rising incidence of maternal and prenatal mortality and morbidity rising from mismanaged labor. A significant cause of maternal mortality in our population is prolonged labor and injudicious management of labor. The early detection of abnormal progress of labor by the use of partograph will prevent prolonged labor and its attendant risks of postpartum hemorrhage and sepsis, eliminate obstructed labor, uterine rupture and its sequelae; all of which are the major causes of maternal mortality and morbidity in our environment(21–25).

2.2 Magnitude of Partograph Utilization

Actual level of partograph use varies greatly from region to region and from facility to facility. In addition, the cadre of staff actually utilizing the partograph appears to vary greatly. Those planning training for the partograph must take this variability into account to ensure that the appropriate staff are receiving the information and developing the skills needed for implementation. An effective supervision and monitoring component to any partograph introduction and training is crucial(4).

Even though partograph is very important in the reduction of maternal and neonatal morbidity and mortality caused by prolonged and obstructed labor, studies revealed that there is low prevalence of partograph utilization in Ethiopia. Cross sectional study conducted in Amhara region showed that among the total 160 charts reviewed, 128 (80%) of them were having the partograph paper attached. From which, however, only 58 (45.3%) charts were documented to assess the progress of labor. Among those filled (58) partograph charts, only seventeen (29.3%) of them were properly documented. Finding from the Studies conducted in North Shoa and Jimma Specialized Hospital also showed poor utilization of partograph. Among the participants of the study in North Shoa, only 40.2% used partograph to manage labor(16,17,26).

However, finding from some studies revealed that above half of the participants used partograph routinely for monitoring of labor. For example, studies from Addis Ababa and Bale Zone revealed that from the study participants those who used partograph routinely are 57.3% and 73.3% respectively (19,22). The practice of respondents on frequency of recording on the partograph showed that: from 146 observed charts 146 (100%) for cervical dilatation, 144 (98.6%) for fetal heartbeat, 146 (100%) for color of liquor, 146 (100%) for contraction, 142 (97.3%) for descent, 146 (100%) for maternal BP, 145 (99.3%) for maternal pulse, 146 (100%) for the first dilatation plotted on the alert line, and 139 (95.2%) for membrane intact or ruptured (19).

2.3 Factors Associated with Utilization of Partograph

2.3.1 Socio Demographic Factors

Study conducted in western Oromia revealed that being female obstetrics care provider were significantly associated with consistent utilization of partograph or Female obstetric care providers were more likely to use partograph than male obstetric care providers (27). But, there are no other studies that support this finding. Study conducted in Eastern Gojjam revealed that level of education was one of the factors affecting utilization of partograph. The utilization of the partograph was significantly higher among obstetric caregivers holding a Bachelor of Science (BSc) degree and above, compared to diploma holders(20). However, study conducted in central zone of Tigray reported that utilization of the partograph was significantly higher among obstetric caregivers holding diploma, compared to Bachelor of Science (BSc) degree and above holders.

2.3.2 Knowledge about Partograph and Utilization of Partograph

Partograph is simple and less costly to implement and best prevention mechanism of maternal mortality from complications of prolonged and obstructed labor. But, it is not widely used due to different factors including knowledge about partograph in different parts of the world (28).

A cross sectional study conducted in Nigeria revealed that factor affecting utilization of the partograph was lack of knowledge in the use of the partograph (22.2%). A significant relationship existed between knowledge of the partograph and its utilization (29).

Cross sectional study from Amhara region revealed that only 53.4% of the study participants had good knowledge of the partograph. There were also factors which are associated with knowledge about partograph. Females were more likely to have good knowledge of the partograph than males. Similarly, those who had previous obstetric training were more likely to have good knowledge of

the partograph than counter parts. However, participants' level of knowledge of components of the partograph was very poor. While only 26.6% of participants were able to mention 50% or more of components of the partograph; females, midwives, and those having prior obstetric training were found to have better knowledge of components of the partograph than their counter parts (17).

Study from North Shoa also revealed that being knowledgeable on partograph is an influencing factor of partograph utilization. Knowledge about partograph was significantly associated with partograph utilization positively(16).

2.3.3 Attitude of Obstetric Care Providers toward Partograph

Providers' attitudes have the potential to greatly influence both the introduction of the partograph and the ability to sustain high-quality, effective use of it at a health facility. There are studies showing how much attitude of obstetric care givers toward partograph affects partograph utilization. Study from Niger delta region of Nigeria revealed that from 165 midwives,92.7% of the respondents agreed that the use of partograph would increase efficiency of labor monitoring and (84.8%) of them were agreed the use of partograph is necessary to improve the quality of care (9).

Cross sectional studies conducted in East Gojjam Zone revealed that 55% of the obstetric care providers had a favorable attitude towards partograph. However, only 40.7% of the care givers agreed to use partograph, but 64.1% of them had agreed that maternal and newborn morbidities and mortalities can be reduced by using partograph (28).

A cross sectional study which conducted in North Shoa Zone, Central Ethiopia also revealed that attitude of obstetric care providers towards partograph use were significantly associated with partograph utilization. Those who had a favorable attitude towards partograph utilization were more likely to use partograph than those with non-favorable attitude. From respondents 282 (97.6%) participants agreed on the need for all women in labor to be assisted using the partograph, 15.6% (55) of the participants disagree with the notion that all skilled birth attendants must know about the partograph (16).

Study from Amhara region revealed that although it was revealed that majority of the participants had favorable attitude toward the use of partograph, only 29% of the paragraph papers reviewed was properly filled to monitor the progress of labor. Despite significant number of study

participants reported that the partograph is useful to monitor labor and make timely decision, their level of knowledge of the partograph and its components was generally poor (17).

2.3.4 Professional Characteristics of Obstetric Care Providers

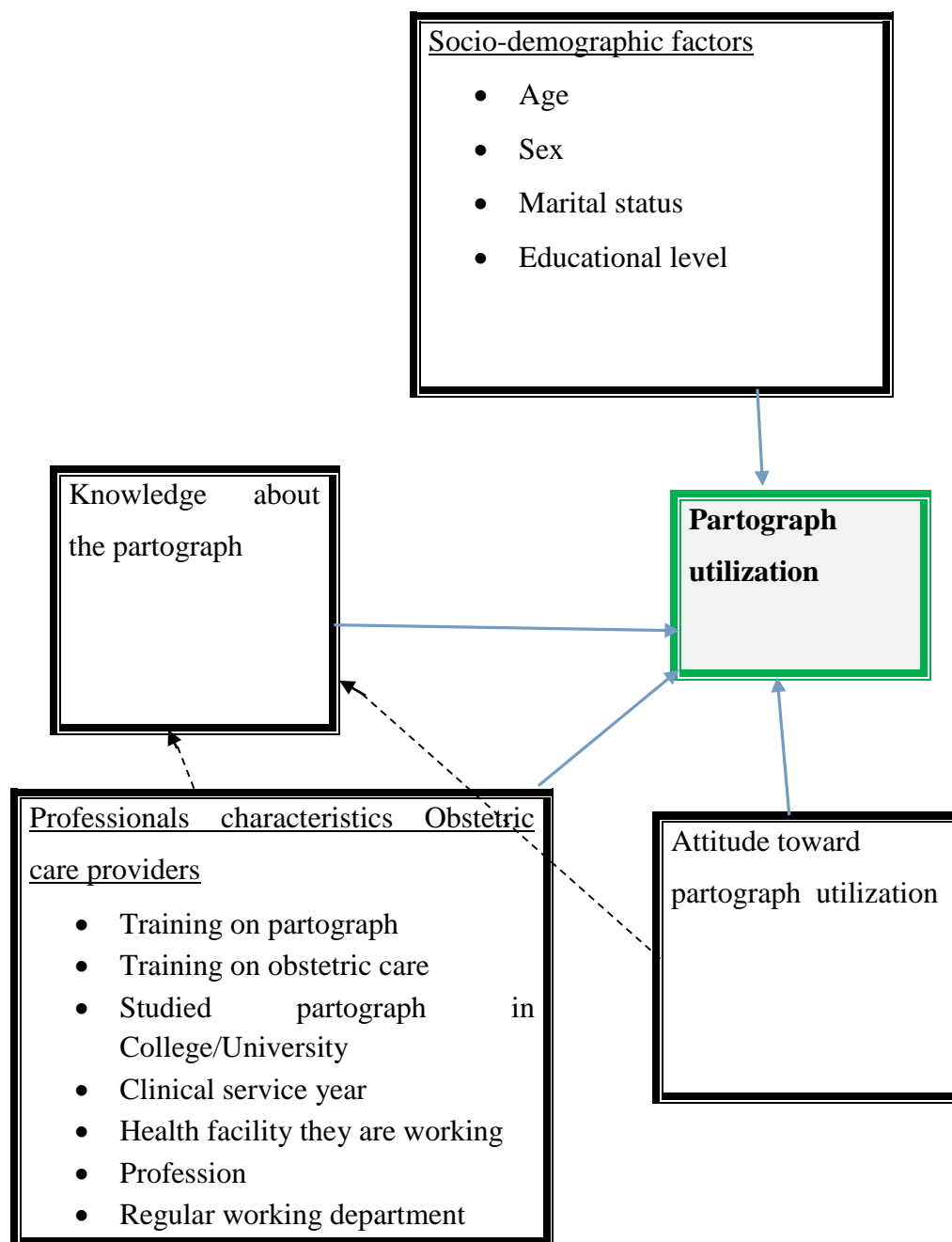
Study carried out in North East Gojjam revealed that obstetric care providers who had on job training on partograph were more likely to use partograph during labor and delivery. Study conducted in Amhara Region also revealed that participants who had previous training in obstetric care were more likely utilize partograph in monitoring of labor. Study from North Shoa zone revealed that training was significantly associated with routine partograph utilization.

A cross sectional study conducted in Nigeria revealed that a significant relationship existed between midwife's years of experience and partograph utilization and this study also revealed that those who are working in hospitals were more likely to use partograph than those who were working in health centers (9). Other study which supports the above finding is conducted in North Shoa Zone (16). However, cross sectional studies conducted in Addis Ababa, Amhara Region and Bale Zone revealed that there is no significant association between midwife's years of experience and partograph utilization (17,19,22).

The other professional characteristic of obstetric care providers that may be associated with partograph utilization is types of profession. A cross sectional study which is conducted in North Shoa Zone, Northern Ethiopia revealed that types of profession were significantly associated with partograph utilization. Those who were midwives by profession were more likely to have a consistent utilization of the partograph than general practitioners and nurses who were working in the maternity unit (16).

2.3.5 Conceptual Frameworks of Partograph Utilization

The frame work is developed after reviewing related research articles with this study which are conducted in different areas in Ethiopia (Eastern Gojjam, Addis Ababa and Amhara region) (17,22,30). The following factors such as socio-demographic characteristics, knowledge and attitude towards use of partograph and professional characteristics of obstetric care providers may affect partograph utilization.



Where, —————> strong association

-----> Weak association

Figure1: Conceptual framework of partograph utilization and associated factors adapted from previous literatures

CHAPTER THREE: OBJECTIVES

3.1 General Objective

To determine the magnitude of partograph utilization and its associated factors among obstetric care providers at public health facilities of Hadiya Zone, SNNPR, and Ethiopia, 2019.

3.2 Specific Objectives

1. To determine the magnitude of partograph utilization among obstetric care providers in maternity units of public health facilities of Hadiya Zone.
2. To measure factors affecting partograph utilization among obstetric care providers in maternity units of public health facilities of Hadiya Zone.

CHAPTER FOUR: METHODS AND MATERIALS

4.1 Study Area and Period

The study was conducted from March 04 to April 07, 2019, in Hadiya Zone, which is found in Southern Nation's Nationalities and Peoples Region (SNNPR), Ethiopia. The capital city of the zone is Hossana which is about 232 KM far away from the capital city (Addis Ababa). Hadiya Zone has total area of 3542.66 square kilometers, administratively divided into 13 districts and 3 town administrations with total population of nearly 1.69 million. According to the last year report of Hadiya Zone health department, there are 1 teaching hospital and 3 primary hospitals, 80 private clinics, 61 health centers and 311 health post in the zone. Regarding health professionals, there are 2,436 health providers, among these health workers, 1,360 health workers were providing labor and delivery service.

4.2 Study Design

Facility based cross sectional study design was employed.

4.3 Population

4.3.1 Source Population

All Obstetric care providers who are working at public health facilities of Hadiya Zone, Southern Ethiopia.

4.3.2 Study Population

All selected obstetric care providers who are working at selected public health facilities.

4.3.3 Inclusion and Exclusion Criteria

4.3.3.1 Inclusion Criteria

Study participants who have worked in maternity unit either on regular basis, by rotation or at duty time from each selected health facilities were enrolled into the study irrespective of their duration of the stay in the delivery unit.

4.3.3.2 Exclusion Criteria

Those health professionals who never attend labor cases in the selected health facilities were excluded.

4.4 Sample Size Determination and Sampling Procedure

4.4.1 Sample Size Determination

Sample size determination for the first objective: The sample size was determined by using single population proportion formula, by taking prevalence of 53.85% ($p=0.53$) which is obtained from a study conducted in Eastern Gojjam Zone, Northwest, Ethiopia (20). It considers the following assumption, 5% margin of error and 95% confidence level ($Z= 1.96$). It was calculated as follows:

$$n = \frac{(Z_{\alpha/2})^2 \times pq}{d^2}$$

Where,

n = the desired sample size

p = the proportion taken from the research done in Eastern Gojjam Zone (53.85%)

Z = is the standard normal score set at 1.96 (95% confidence interval)

d = is the margin of error to be tolerated (5%)

$$n = \frac{(Z_{\alpha/2})^2 \times pq}{d^2}$$

$$= \frac{(1.96)^2 \times (0.53 \times 0.47)}{(0.05)^2} = \frac{0.956}{0.0025} = 383.4$$

$$(0.05)^2 \quad 0.0025$$

$$\approx 384$$

For the second specific objective: The sample size is determined by considering factors such as types of profession, attitude towards using partograph, and training using epinfo version 7.2.2.2. The resultant sample size for the second objective is shown in the table below.

Table 1: - The resultant sample size determination for the second specific objective

s.no	Variable	Confidence level	Power	Ratio (Unexposed :	% outcome in unexposed group	Risk ratio	Odds ratio	% outcome in exposed group	Sample size	Reference
1	Attitude	95%	80 %	.27	26	2.27	4.09	59%	120	(16)
2	On job training	95%	80 %	2	42%	1.83	4.62	77 %	81	(28)
3	Type of profession	95%	80 %	1.65	32 %	2.25 6	11.4 7	73%	58	(28)

The sample size calculated for the first specific objective was used for this study Since it is greater than the sample sizes calculated for the second objectives.

Taking non-response rate of 10 % and design effect of 1.5 because multi stage sampling technique was employed, the total sample size was $(10\% \times 384 + 384) = 423 \times 1.5 = \mathbf{635}$.

Since, the source population is less than 10,000, correction factor was used to estimate the final sample size required.

$$nf = \frac{n}{1 + \frac{n}{N}}$$

635

$$nf = (1 + 635/1360) \approx \mathbf{436}$$

where,

n_f =final sample size

N =total number of source population

Therefore, the minimum sample size required for this particular study was **436**.

Sample size for the qualitative part (for data abstraction from document): Ten recently (one week before the data collection) used tool or WHO modified partograph charts from one selected hospital and five recently used partograph charts from each 11 selected health centers were used for the document review (31).

4.4.2 Sampling Procedure

In Hadiya zone, there are one teaching hospital, three primary hospitals and sixty-one health centers and all of them provides labor and delivery services. Multi stage sampling method was carried out to select study participants. Lottery method was carried out to select health facilities at the primary level. Thirty percent of public health facilities were included to obtain adequate sample size according to WHO recommendation (33). Then lottery method was used to select study participants after proportional allocation of health professionals found at each health facilities. To employ lottery method on each facility, sampling frame was prepared by listing the name of health professionals.

In the selected health centers, health professionals from all departments have a chance to be included in the study by taking into account that they are always rotated among departments including the delivery unit every two to three months. In addition, when health center staffs are assigned at night and weekend duty, they provide all types of services including delivery care. In hospitals, providers only from delivery, Antenatal care (ANC), Post Natal Care (PNC), Family Planning (F/P) and Gynecology units was included because the trend of rotation is only among these departments not include other departments. The schematic presentation of sampling procedure is presented as follows.

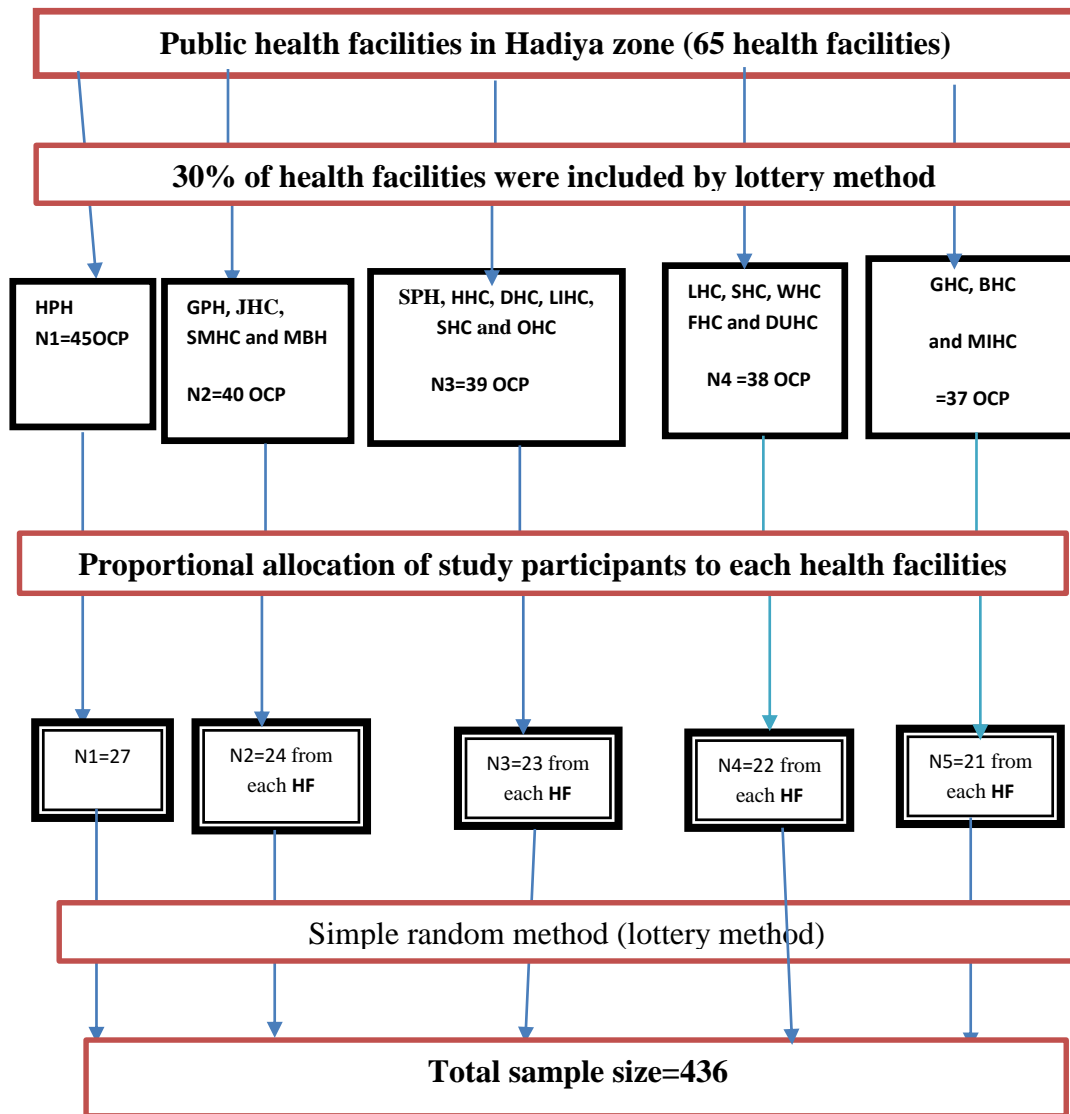


Figure2: Schematic presentation of sampling procedure, Hadiya zone, southern Ethiopia, 2019.

Where, HPH =Homecho primary hospital, GPH= Gimbichu primary Hospital, MCH = Morsito Health center, GHC= Gabo health center, HHC = Hossana Health center, BHC =Bobicho health center, SHC=Shurmo health center, OHC= Omocora health center, LHC=Lisana health center, SHC=siko health center, WHC=Wasgabeta health center, JHC =Jawe health center, DHC =Duna health center, FHC=Fonko health center, SMHC=Shone mazoria Health center, OCP = Obstetric care providers.

4.5 Data Collection Tools and Procedures

4.5.1 Data Collection Tools

A pre-tested and structured, self-administered questionnaire was adapted from previous relevant literature related to the problem under the study to include all the possible variables that address the objectives of the study (16,18,19,27,30). The questionnaire mainly focused on socio demographic characteristics, professional characteristics of obstetric care providers and other factors like knowledge about partograph and attitude toward partograph utilization.

4.5.2 Data Collection Method

Quantitative Data Collection Method: Pretested self-administered structured questionnaire was used for quantitative data collection and the study participants were instructed how to fill the questionnaire. Data was collected from all selected obstetric care providers by 6 trained data collectors. Data collectors were three clinical nurses and three midwives and training was given for them for two days. Two trained BSc midwives were also assigned for supervising and review of recently used partograph for checking the completeness of the partograph.

Qualitative Data Collection Method: Data abstraction from recently used partograph charts was carried out by two trained midwives among ten recently used partograph from one hospital and five from each 11 health centers to know whether the parameters on the partograph filled correctly and completely in obstetric ward/unit, during active first stage of labor by using structured checklist which is developed from the WHO modified partograph.

4.6 Study Variables

4.6.1 Dependent Variable

Partograph utilization

4.6.2 Independent Variables

- Socio demographic characteristics: - Sex, age, marital status and level of education.
- Professional characteristics of obstetric care providers such as training on partograph, training on obstetric care, clinical experience, health facilities they are working, types of profession, studied partograph in College/University and department they are working regularly.
- Knowledge and Attitude

4.7 Operational Definition

Partograph utilization: - using partograph by obstetric care givers routinely for all laboring mothers. It was measured by using two steps questions. The first step is requesting the participants whether they have been using partograph or not. Second step, the respondents who responded as “Yes” in the first step was required to answer” how often” they have been using partograph (occasionally, sometimes and routinely). Finally, those who are using partograph routinely categorized as partograph utilizes and those who never use partograph and using partograph sometimes and occasionally were considered as non-utilizes. Further, partograph utilization was classified as low if partograph use in the study area was below 60% and high if it was greater than or equal to 60% (9,16).

Knowledge about partograph: -Knowledge about partograph was measured by using seven knowledge related questions. In order to produce a more objective assessment of knowledge about partograph a scoring method was used and a knowledge score for each participant was obtained by adding up the score for correct response given to selected questions in the questionnaire. Those who Scored 60% and above to knowledge related questions were considered as knowledgeable whereas those who scored less than 60% considered as not knowledgeable (29).

Attitude: - Providers’ attitude toward partograph utilization was assessed by using a 5-point Likert scale questions as individuals responding strongly agree for positive attitude was given scores of 5 and 1 for those who responded as strongly disagree, while the above scores was reversed for negative attitude questions. the total score was dichotomized into favorable and an unfavorable attitude taking the mean score as a cutoff point that means mean score or more classified as favorable attitude and less than the mean score as unfavorable attitude.

Obstetric care providers: - Include medical doctors, midwifery, nurses and health officers who are providing delivery service by regular time, rotation and duty time

Complete and correct recording of parameters on partograph means recording each eighteen parameters on the space provided on the partograph and at the allowed time gap for each parameters.

4.8 Data Quality Assurance

Before actual data collection, 5% of sample size was pretested for identifying missing values and to check for consistency in nearby health center in Silte zone. Cronbach alpha was determined for the composite variables and it was 0.71, 0.8 and 0.72 for the items assessing knowledge status, attitude of obstetric care providers and over all items respectively. After the pretest further adjustments were done to improve understandability of the questionnaire and to help the tool to address objectives of the study. Further, training of data collectors, making the objectives of the study clear to the study participants and supervision of data collection was used to enhance quality of data. During data collection each day, questionnaires were reviewed and checked for completeness and clarity by the supervisors and principal investigator and the necessary feedback was offered to data collectors in the next morning.

4.9 Data Processing and Analysis

The questionnaire was checked manually for its completeness, was coded and entered into Epi data version 3.1 statistical packages, then exported to SPSS version 20.0 for analysis. Both summary and descriptive statistics was done. Tables and bar graph was used to present data. Multicollinearity was diagnosed using VIF (<10) and Hosmer-Lemeshow was performed to test for lack of model fitness ($p >0.3$). Binary logistic regression analysis was used to assess any association between the dependent variable and independent variables. To control the potential effects of confounders and not to miss important variables, independent variables with a p-value of less than 0.25 at the bivariate analysis was entered into the multivariable logistic regression model. In this model, the level of significance and strength of the association was determined at a 95% confidence interval with a p-value of less than 0.05 and AOR with 95% confidence interval respectively.

4.10 Ethical Consideration

The study was reviewed and approved by the IRB at the institute of Health Sciences of Jimma University. Permission letter was obtained from the SNNPR Health Bureau and Hadiya zone Health Department. The study participants were informed clearly and in detail about importance of the study and verbally informed and a written consent was obtained. They were also have informed about the confidentiality of the data and their identities were removed to assure the confidentiality.

4.11 Result Dissemination Plan

The result of the study will be presented to the Jimma University scientific community and submitted to the Department of Health economics, policy and management. The findings of the study also will be disseminated to SNNPR Regional Health Bureau, Hadiya Zone Health Department, to the organization or institution that has direct or indirect input to the findings of the study and Publications in peer-reviewed, national journals will also be considered.

CHAPTER FIVE: RESULTS

5.1 Socio-Demographic Characteristics of Study Participants.

In this study, from a total sample size, 399 participants responded the questionnaire making a response rate of 91.5%. As shown in the table below around 156(39.1%) participants were in the age category of 25-29 followed by the age category 30-34 years. The mean and standard deviation of the respondents' age were 28.9 and ± 4.70 years respectively. From the study participants more than half 220(55.1%) were female. **(please see the table below)**

Table 2: Socio-demographic characteristics of respondents in Hadiya Zone, SNNPR Ethiopia.

Variables		Frequency	Percent
Age category of the respondents	20-24	77	19.3
	25-29	156	39.1
	30-34	112	28.1
	≥ 35	54	13.5
Sex	Female	220	55.1
	Male	179	44.9
Marital status	Married	150	37.6
	Single	246	61.7
	Divorced	3	0.7
Respondent's religion	Orthodox	147	36.8
	Muslim	38	9.5
	Protestant	203	50.9
	Catholic	11	2.8
Level of education	Degree or more	259	64.9
	Diploma	140	35.1

5.2 Professional Characteristics of Obstetric Care Providers

Most of the respondents were nurses by profession (44.4%) followed by midwives (35.3%) including both BSc and diploma. Regarding clinical year of experience (in years) majority of respondents 282(70%) had clinical work experience in a range 1-5 years. Most of the participants 276(69.2%) were working in health centers. Out of 399 respondents around 227(56.9%) of obstetric care providers received on job training on partograph and only 120(30.1%) respondents received training on obstetric care in their health facilities. **(please see the table on the next page)**

Table 3: Professional Characteristics of Obstetric Care Providers in Hadiya Zone, 2019 .

Variables		Frequency	Percent
Profession	Obstetrician or Gynecologist	0	0
	General practitioner	21	5.3
	Health officer	72	18.0
	BSc Nurse	85	21.3
	Diploma Nurse	80	20.1
	BSc midwives	81	20.3
	Diploma Midwives	60	15.0
Type of Health Facility	Hospital	123	30.8
	Health Center	276	69.2
Years of clinical service	1-5 year	282	70.7
	6-10 year	109	27.3
	>10 years	8	2.0
Regular Working Department	OPD	120	31.1
	ANC And FP	101	25.3
	Labour and Delivery Ward	178	44.6
Training on Obstetric Care	Yes	120	30.1
	No	279	69.9
Studied Partograph	Yes	394	98.7
	No	5	1.3
Training on Partograph	Yes	227	56.9
	No	172	43.1

5.3 Knowledge of Obstetric Care Providers about Partograph

The knowledge status of respondents about partograph assessed by using the criteria that means those who responded 50% and more on knowledge related questions were classified as knowledgeable and those responded less than 50% were classified as not knowledgeable. Depending on this around 216(54.1%) of the obstetric care providers were knowledgeable in this study, however almost all of the respondents (98.7%) reported that they have learned about partograph when they were in Colleges/Universities.

5.4 Attitude of Obstetric Care Providers toward Partograph Utilization

Attitude of obstetric care providers toward partograph utilization assessed using Likert scale questions and classified as favorable and unfavorable attitude after calculating mean score. The mean score calculated was 3.37 and those who score 3.37 and more classified as they had favorable attitude and below 3.37 classified as unfavorable attitude. Using the above cutoff point about half (52.1%) of obstetric care providers scored 3.37 or above on attitude related questions and they are considered as obstetric providers who had favorable attitude toward partograph utilization.

5.5 Partograph Utilization

The overall magnitude of routine utilization of partograph among participants to monitor labor for all laboring mothers was found to be only 217(54.4%) with 95% CI of (50.1, 59.6). In addition, completeness of parameters presented on the partograph charts was also assessed by reviewing recently (one week before the data collection) used 65 partograph charts weather the components of the partograph were filled completely or not in twelve health facilities. As shown in the table 2 below only ten charts were filled completely out of sixty-five recently used partograph charts. From eighteen parameters which are presented on the partograph charts only ten parameters were filled correctly and completely. These are client name, status of membrane, fetal heart rate status of amniotic fluid, maternal blood pressure, body temperature, pulse rate, uterine contraction, parity and initial cervical dilatation. **(please see the table on the next page)**

Table 4: Parameters recorded by obstetric health providers in partograph while attending labour in selected health institution of Hadiya Zone, SNNPR Ethiopia, 2019 (n=65)

Parameters	Frequency	Percent (%)
Client name		
Not recorded	0	0
Recorded	65	100
Total	65	100
Card number		
Not recorded	10	15.4
Recorded	55	84.6
Total	65	100.0
Date and time of admission		
Not recorded	19	29.2
Recorded	46	70.8
Total	65	100.0
Gravid/Para		
Not recorded	0	0
Recorded	65	100.0
Total	65	100.0
Fetal heart beat		
Not recorded	0	0
Recorded	65	100.0
Total	65	100.0
Status of membrane		
Not recorded	0	0
Recorded	65	100.0
Total	65	100.0
Status of amniotic fluid		
Not recorded	0	0
Recorded	65	100.0
Total	65	100.0
Molding		
Not recorded	30	46.1
Recorded	35	53.9
Total	65	100.0
Maternal blood pressure		
Not recorded	0	0

Continuation of table four from page 23.

Recorded	65	100.0
Total	65	100.0
Maternal body temperature		
Not Recorded	0	0
Recorded	65	100.0
Total	65	100.0
Maternal pulse rate		
Not Recorded	0	0
Recorded	65	100.0
Total	65	100.0
Cervical dilatation		
Not Recorded	0	0
Recorded	65	100.0
Total	65	100.0
Descent		
Not Recorded	35	53.9
Recorded	30	46.1
Total	65	100.0
Immediate maternal out come		
Not recorded	45	69.2
Recorded	20	30.8
Total	65	100
Uterine contraction		
Not Recorded	0	0
Recorded	65	100.0
Total	65	100.0
Action taken		
Not Recorded	33	50.7
Recorded	32	49.3
Total	65	100.0
Urine test		
Not Recorded	43	66.2
Recorded	22	43.8
Total	65	100.0
Mode of delivery		
Not Recorded	34	52.3
Recorded	31	47.7
Total	65	100.0

5.6 Reasons for Not Using the Partograph

According to this study from those respondents who were not using partograph routinely the main factors that were reported by them as influencing against routine use of the partograph includes; unavailability of partograph in the labor ward, absence of on job training, lack of supervision, using partograph is time consuming and lack of trained human power.

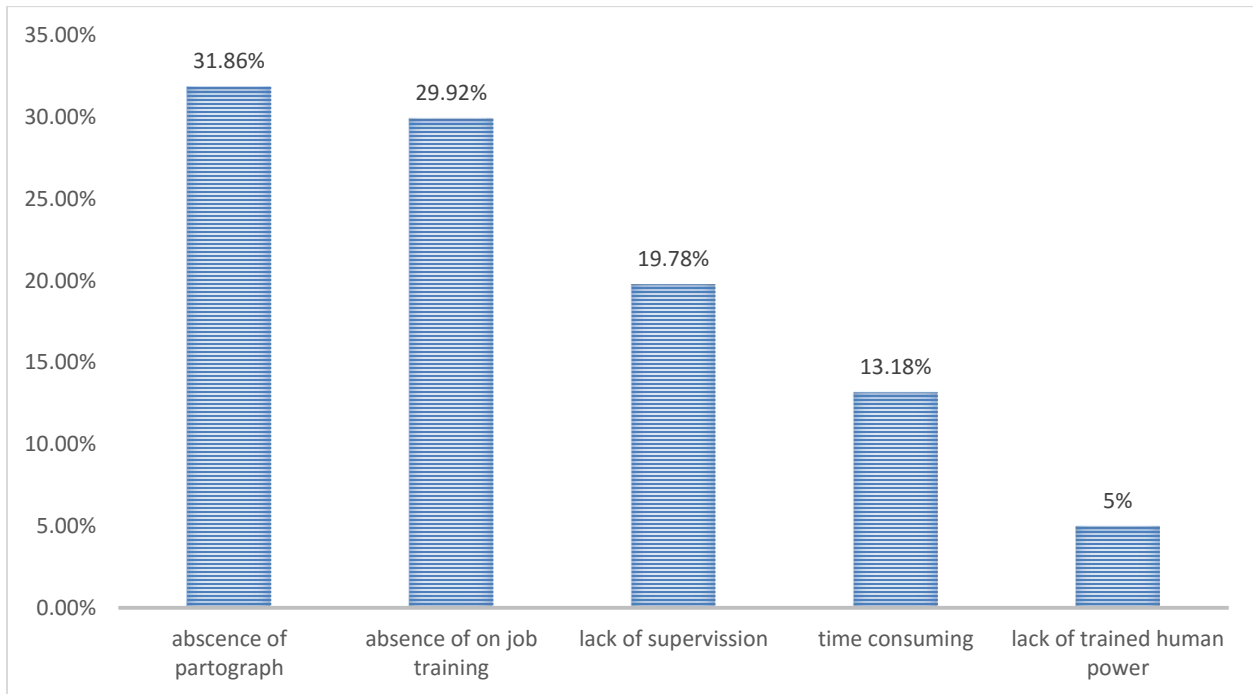


Figure3: Reasons for not using the partograph by obstetric care providers of public health institution in Hadiya Zone, SNNPR Ethiopia; 2019

5.7 Factors Associated with Partograph Utilization by Obstetric Care Providers

5.7.1 Results of Bivariate Logistic Analysis for Factors Associated with Partograph Utilization

Bivariate logistic regression for factors associated with partograph utilization was performed. According to bivariate logistic regression as shown in table 3 below from socio demographic factors gender of the respondents and level of education were significantly associated with partograph utilization. From professional characteristics of respondents; on job training on partograph and types of health facility they are working were significantly associated with partograph utilization. The other factors which were significantly associated with partograph utilization are knowledge about partograph and attitude of obstetric care providers toward

partograph utilization. Other factors were not candidates for multivariable logistic regression analysis because their p value was greater than 0.25. **(please see the table below)**

Table 4: Results of bivariate analyses for factors associated with partograph utilization among obstetric care providers, Southern Ethiopia, July, 2019(n=399).

Variables	Category	Partograph utilization		Crude OR with 95 % CI	P value
		Utilized	Not utilized		
Gender	Female	127(57.7%)	93(42.3%)	1.3(1.2-2.9)	0.13
	Male	90(50.3%)	89(49.7%)	1	
Work place	Hospital	91(26%)	32(74%)	3.38(3.12-5.4)	.001
	Health centers	126(45.7%)	150(54.3%)	1	
Level of education	Degree or more	154(59.5%)	105(40.5%)	1.79	.006
	Diploma	63(45.0%)	77(55.0%)	1	
On job Training	Yes	172(75.8%)	55(24.2%)	8.8(5.59-13.92)	.001
	No	45(26.2%)	127(73.8%)	1	
Attitude	Favorable	125(60.1%)	83(39.9%)	1.62(1.09-2.4)	.017
	Unfavorable	92(48.2%)	99(51.8%)	1	
Knowledge	Knowledgeable	143(66.2%)	73(33.8%)	2.88(1.91-4.34)	.001
	Not knowledgeable	74(40.4%)	109(59.6%)	1	

Where, 1= reference group

5.7.2 Results of Multivariable Logistic Analysis for Factors Associated with Partograph Utilization

Out of six variables which were significantly associated in bivariate logistic regression analysis four variables were significantly associated in multivariable analysis. These are type of health facility they are working, on job training on partograph, knowledge about the partograph and attitude toward partograph utilization. Those who were working in hospital were about 3 times more likely to have routine utilization of partograph than those working in health centers (AOR=2.96 with 95% CI (1.71, 5.12)) and those health workers who were knowledgeable about partograph were about 2 times higher likely to utilize partograph routinely than those who were not knowledgeable (AOR=2.12 with 95% CI (1.30, 3.39)). In addition, those obstetric care providers who received on job training on partograph were about 7 times more likely to utilize partograph routinely than who haven't received on job training on partograph (AOR=7.06 with 95% CI (4.3, 11.37)).

Furthermore, those who had favorable attitude toward partograph utilization were about 2 times more likely to utilize partograph routinely than their counterparts (AOR=1.8 with 95% CI (1.12, 2.97)). **(please see the table on the next page)**

Table 5: Results of multivariable analyses for factors associated with partograph utilization among obstetric care providers, Southern Ethiopia, July, 2019(n=399)

Variables	Category	Partograph Utilization		Adjusted OR with 95% CI	Adjusted p value
		Utilized N ₀ (%)	Not utilized N ₀ (%)		
Work place	Hospital	91(26%)	32(74.0%)	2.96(1.71,5.12)	.001
	Health centers	126(45.7%)	150(54.3%)	1	
Training	Yes	172(75.8%)	55(24.2%)	7.06(4.3,11.37)	.001
	No	45(26.2%)	127(73.8%)	1	
Knowledge	Good	143(66.2%)	73(33.8%)	2.12(1.30,3.39)	.002
	poor	74(40.4%)	109(59.6%)	1	
Attitude	Favorable	125(60.1%)	83(39.9%)	1.8(1.12,2.97)	.015
	Unfavorable	92(48.2%)	99(51.8%)	1	

Where, 1= Reference group, Hosmer and Lemeshow: p= 0.51 classification power=74.4%

Nagelkerke R square =0.37

CHAPTER SIX: DISCUSSION

In this study, only 217(54.4%) respondents used partograph routinely for the management of labor for all laboring mothers. Type of health facility (hospitals or health centers), knowledge about partograph, on job training on partograph and attitude of participants toward partograph utilization were identified as factors which are significantly associated with partograph use.

The overall magnitude of routine utilization of partograph among participants to monitor labor for all laboring mothers was found to be only 217(54.4%) even if using partograph is recommended for all labouring mothers by WHO (32).

This finding were in line with the finding of the study conducted in Addis Ababa (57%) (22). It is higher when compared with the finding of the studies conducted in North Shoa (40.1%)(16) ,Amhara region (29%)(17) and South West Nigeria (32.2%) (9).

The possible explanation for these discrepancies might be due to the study conducted in Amhara region is at regional level which includes all zones in the region however, this thesis represents all obstetric care providers only in Hadiya zone and in case of North Shoa it might be due to the difference in the number of trained obstetric care providers on partograph and the number of trained participants were higher in this study. In this study about 56.95% participants received on job training on partograph and in North Shoa, about 42.1% participants received on job training on partograph. The possible explanation for the difference between the finding of current study and South West Nigeria could be the participants of the study conducted in South West Nigeria included HEWs in addition to other professions. This might affect partograph utilization because they may not be well trained on partograph when compared to other profession.

However, it is lower than the finding of studies conducted in Bale zone, South West Ethiopia (73%) and Niger delta region of Nigeria (98.8%). The possible explanation for this difference could be the participants of the study conducted in Bale zone had high level of knowledge about partograph which is about 61.5% however; only 54.1% of the participants of current study had good knowledge about partograph. The possible explanation for the difference between current study and Niger delta region of Nigeria could be the participants of the study conducted in Niger Delta Region were only midwives by profession however; participants of current study were from different professions who were providing obstetric care. Participating only midwives on studies

might increase partograph utilization because they had a great chance to be trained on partograph than other professions which might in turn improve their knowledge and skill of its utilization.

Even if more than half of respondents were knowledgeable and used partograph routinely for monitoring labor, only ten parameters were filled correctly and completely from eighteen parameters which are presented in partograph charts. This implies obstetric care providers may have skill gap and poor attention in recording parameters in partograph charts.

According to this study from those respondents who were not using partograph routinely the main factors that were reported by them as influencing routine use of the partograph includes; unavailability of partograph in the labor ward (31.86%), absence of on job training (26.92%), lack of supervision (19.78%), using partograph is time consuming (13.18%) followed by lack of trained human power (5%).

As observed from the analysis part of this study the type of health facility the participants are working in is one of the factors affecting partograph utilization. Partograph utilization was higher among those who are working in hospitals compared to those working in health centers.

This could be due to the fact that majority of obstetric care providers in hospitals were midwives and most of them were also Bachelor science degree holders compared to health centers and this could increase partograph utilization because they can receive majority of obstetric training in turn it increases knowledge about partograph and skill of partograph utilization. It is supported by the finding of the study conducted in Bale zone.

However, finding observed in study conducted in Addis Ababa revealed that those working in health centers used partograph more when compared to those who were working in Hospitals. This might be majority of obstetric care providers working in health centers in Addis Ababa received on job training on partograph and frequent supervision as compared to those working in Hospitals and health centers in other places.

The other factor that was significantly associated with partograph utilization was knowledge about partograph. Those who were knowledgeable about partograph were more likely to utilize partograph than those who were not knowledgeable about partograph. This could be it is obvious that having good knowledge about the partograph might enhance obstetric care providers' skills and competency to use the tool properly. The finding is consistent with findings of the studies conducted in North Shoa(16), Amhara Region(17), Eastern Gojjam(20) and it is also supported by

the findings of the studies done in Niger delta region of Nigeria(14) and the University of Caliber Teaching Hospital, Caliber, Nigeria(15).

In addition, on-job training on partograph had a significant association with partograph utilization. Those obstetric care providers who received on job training on partograph were more likely to utilize partograph than those who haven't received on job training. This might be due to the fact that, obstetric care providers who received on-job training had better knowledge about partograph than others that in turn improves their skills and partograph utilization. This finding is supported by the findings of the studies done in North Shoa (16), Eastern Gojjam(28),Addis Ababa (22)and Amhara Region(17)..

Furthermore, it was also observed that attitude toward partograph utilization was significantly associated with partograph utilization. Those who had favorable attitude toward partograph utilization were more likely to utilize partograph when compared to those who had unfavorable attitude towards partograph utilization. This might be those who had favorable attitude toward use of partograph might be well motivated to improve skill and use the partograph. This finding is similar with the finding of the study conducted in North Shoa, Northern Ethiopia(16).

One of the limitations of this study was social desirability bias because the data was collected by using self-administered questionnaire. The other limitation was non-response bias or non-participation bias. In order to reduce these limitations information about the importance of the study finding was given for the study participants clearly prior to data collection. In addition, pre testing and adding contingency samples were considered to control non participation bias. The study also couldn't establish causal relationship between partograph utilization and independent variables because of the cross-sectional nature of the study.

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATION

7.1 CONCLUSION

According to this study the overall partograph utilization was found to be low and incomplete recording of required parameters was observed. Type of health facility (hospitals or health centers), knowledge about partograph, training on management of labor and partograph and attitude of participants toward partograph utilization were identified as factors which are significantly associated with partograph utilization.

7.2 RECOMMENDATION

Recommendation to SNNPR Health Bureau and Hadiya Zonal Health Department

- Should work to ensure sustainable distribution of partograph charts to health facilities.
- Should provide both on job and in service training on obstetric care and use of partograph.
- Should work to improve knowledge and attitude of the obstetric care providers toward partograph utilization.

Recommendation to DHO and Administrators of Health Facilities

- Should work together with Hadiya Zonal Health Department to improve knowledge and attitude of the obstetric care providers toward partograph utilization.
- Monitoring and supportive supervision of obstetric care providers to ensure appropriate use of the partograph.

Recommendation to Obstetric Care Providers

- Partograph should be considered as a vital tool for diagnosing abnormality during the progress of labor and decision making tool in order to reduce maternal and new born mortality and provide quality of health care.
- It should be used for every woman in labor and taken with a great commitment by all care providers.

REFERENCES

1. Kushwah B, Singh AP, Singh S. The Partograph: An Essential Yet Under Utilized Tool. 2013;2(24):4373–9.
2. Mathai M. The Partograph for the Prevention of Obstructed Labor. 2009;52(2):256–69.
3. WHO, UNICEF, UNFPA BW. Trends in Maternal Mortality : World Bank Group and the United Nations Population Division Geneva. World health organization. 2014.
4. Levin, K A, Kabagema J. A. Use of the Partograph : Effectiveness , Training , Modifications , and Barriers_ A Literature Review. New York: EngenderHealth/Fistula care. 2011;3–30.
5. WHO. The application of the WHO partograph in the management of labour. 1991.
6. Bedwell C, Levin K, Pett C, Lavender DT. A realist review of the partograph : when and how does it work for labour monitoring ? BMC Pregnancy Childbirth [Internet]. 2017;1–11. Available from: <http://dx.doi.org/10.1186/s12884-016-1213-4>
7. FMOH. Maternal Death Surveillance and Response (MDSR). Technical Guideline, Addis Ababa, Ethiopia. 2012.
8. Central Statistical Agency. Demographic and Health Survey Key Indicators 2016. 2016.
9. Fawole A, Adekanle D, Hunyinbo I. Utilization of The Partograph in Primary Health Care Facilities In Southwestern Nigeria. Niger J Clin Pract. 2010;13(2):2–5.
10. Ashebir Getachew, Jim Ricca, David Cantor, Barbara Rawlins H, Gibson, Alemnesh Tekleberhan, Linda Bartlett HG. Quality of Care for Prevention and Management of Common Maternal and Newborn Complications : A Study of Ethiopia ’ s Hospitals. Jhpiego Brown’s Wharf 1615 Thames Str Balt Maryl 21231-3492, USA www.jhpiego.org. 2011;18–49.
11. Tayade S. The impact of use of modified WHO partograph on maternal and perinatal outcome. ResearchGate. 2012;03(04):257–60.
12. Maphasha OM, Govender I, Motloba DP, Barua C. Use of the partogram by doctors and

- midwives at Odi District Hospital , Gauteng , South Africa. *South African Fam Pract* [Internet]. 2017;59(2):3–6. Available from:
<http://dx.doi.org/10.1080/20786190.2017.1280899>
13. Ollerhead E, Osrin D. Barriers to and incentives for achieving partograph use in obstetric practice in low- and middle-income countries : a systematic review. *BMC Pregnancy Childbirth* [Internet]. 2014;14(281):1–7. Available from:
<http://www.biomedcentral.com/1471-2393/14/281>
 14. Opiah MM, Ofi AB, Essien EJ, Monjok E. Knowledge and Utilization of the Partograph among Midwives in the Niger Delta Region of Nigeria. *Afr J Reprod Health*. 2012;16(1):4–8.
 15. Udeme Asibong, Ita B Okokon TUA, Margaret Opiah, Essien EJ, Monjok E. The use of the partograph in labor monitoring : a cross-sectional study among obstetric caregivers in General Hospital ,Calabar, Cross River State, Nigeria. *Int J Women’s Heal*. 2014;4(6):3–8.
 16. Wakgari N, Amano A, Berta M, Tessema GA. Partograph utilization and associated factors among obstetric care providers in North Shoa Zone , Central Ethiopia : a cross sectional study. *Afr Health Sci*. 2015;15(2):2–4.
 17. Abebe F, Birhanu D, Awoke W, Ejigu T. Assessment of knowledge and utilization of the partograph among health professionals in Amhara region , Ethiopia. 2013;2(2):2–16.
 18. Dulla, Dubale, Kidist Eshetu EH. Magnitude of Partograph Use and Associated Factors among Obstetric Care Givers in Public Health Institution in Sidama Zone , Southern. 2017;14:2–8.
 19. Markos D, Bogale D. Knowledge and utilization of partograph among health care professionals in public health institutions of Bale zone , Southeast Ethiopia. *Public Health* [Internet]. 2017;137(January):2–8. Available from:
<http://dx.doi.org/10.1016/j.puhe.2016.02.026>
 20. Zelellw DA, Tegegne TK. Level of partograph utilization and its associated factors among

- obstetric caregivers at public health facilities in East Gojam Zone , Northwest Ethiopia. 2018;07:1–13.
21. Orj EO, Fatus AA, Nde NOMAK, Adeyem BA, Egwu UO. Impact of Training on the Use of Partograph on Maternal and Perinatal Outcome in Peripheral Health Centers. *J Turkish-German Gynecol Assoc.* 2007;8(2):148–52.
 22. Yisma E, Dessalegn B, Astatkie A, Fesseha N. Knowledge and utilization of partograph among obstetric care givers in public health institutions of Addis Ababa, Ethiopia. *BMC Pregnancy Childbirth.* 2013;13(17).
 23. Heather.u , Sabina.W, Grace O RS. Improving Partograph Training and Use in Kenya Using the Partopen Digital Improving Partograph Training and Use in Kenya Using the PartoPen Digital Pen System. 2014;2(1).
 24. Rachhoya P. Universal Acceptance of Partogram. *ResearchGate.* 2017;3(10):640–4.
 25. Nurus A, Khan S, Billah SM, Mannan I, Mannan I, Begum T, et al. A cross-sectional study of partograph utilization as a decision making tool for referral of abnormal labour in primary health care facilities of Bangladesh. 2018;1–18.
 26. Kitila SB. Utilization of Partograph during Labour and Birth Outcomes at Jimma. 2014;1(1):1–6.
 27. Regasa H, Tilahun T, Adem H. Utilization of partograph and associated factors among obstetric care givers in hospitals of Western Oromia , Ethiopia , 2017. 2018;8(April):21–4.
 28. Zelellw DA, Tegegne TK, Getie GA. Knowledge and Attitude of Obstetric Care Providers on Partograph and Its Associated Factors in East Gojjam Zone , Northwest Ethiopia. *Hindawi Publ Corp Adv Med [Internet].* 2016;2016:3–9. Available from: <http://dx.doi.org/10.1155/2016/6913165>
 29. Fawole AO HK, DA A. Knowledge and Utilization of the Partograph among obstetric care givers in South West Nigeria. *Afr J Reprod Health.* 2008;12(1):5–8.
 30. Hailu T, Nigus K, Gidey G, Hailu B, Moges Y. Assessment of partograph utilization and

associated factors among obstetric care givers at public health institutions in central. BMC Res Notes [Internet]. 2018;11(710):1–6. Available from: <https://doi.org/10.1186/s13104-018-3814-7>

31. Yisma E, Astatkie A, Fesseha N. Completion of the modified World Health Organization (WHO) partograph during labour in public health institutions of Addis Ababa , Ethiopia. BMC Res Notes. 2013;10(23):1–8.
32. WHO. The WHO partograph. 2017;(2008):1.

ANNEX

Introduction

Hello, my name is _____; I am post graduate student in University of Jimma, we are interviewing obstetric care givers here in _____hospital/health center in order to find out information about utilization of partograph and associated factors. To attain this purpose, your honest and genuine participation by responding to the questions prepared is very important and highly appreciated.

We would like you to answer some personal questions. Your answers are completely confidential and participation is voluntary. Your name will not be written on this form, and will never be used in connection with any of the information you tell me. You don't have to answer any question if you do not want to and you can stop the interview at any time.

However, your honest answer to these questions will help us to better understand the situation and will contribute to improve the health status of child bearing mothers and babies. We would greatly appreciate your help in participating in this study. The interview will take 25 to 30 minutes to ask the questions. Would you be willing to participate?

- Yes, proceed

- No, good bye. Thank you for your cooperation!

CONSENT FORM:

I have been explained all information and procedures that are part of this research study. I have understood the same and I understand that the research imposes no risk on my life and therefore, no compensation would be provided.

I thereby agree to participate in this research study and give my voluntary consent. I hereby also give rights to the researcher for collecting the data that are required for the study.

(Signature of interviewer certifying that informed consent has been given verbally by respondent).

Date of data collection-----

Name of data collector----- signature-----

Name of supervisor----- signature-----

Section I: Self-administered questionnaire on partograph utilization and associated factors

General instruction: We kindly request you to circle or write your response on the space provided for each questions accordingly. Please, keep in mind that there are some skipping patterns that you will follow too.

Part 100: Socio-demographic characteristics

Q. Code	Question (variable)	Response	Response code
101	Age (in full years)	-----	
102	Sex	1. Male 2. Female	
103	Marital Status	1. Single (Never married) 2. Married 3. Divorced 4. Widowed 5. Separated	
104	Religion	1. Orthodox Christians 2. Muslim 3. Protestant 4. Catholic 5. 88. Others (specify) -----	
105	Educational Level	1. Diploma 2. Degree 3. MSc in Emergency Surgery and Obstetrics 4. Specialist (Obstetrician and Gynecologist)	

Part 200: Professional characteristics of obstetric care providers

Q. Code	Question (variable)	Response option	Skip	Response code
201	Profession	1. Obstetrician and Gynecologist (Specialist) 2. Medical Doctor (GP) 3. Public Health (HO) 4. BSc Nurse 5. Diploma Nurse 6. BSc Midwife 7. Diploma Midwife 8. Emergency Surgery and Obstetrician (MSc)		
202	Health Facility you are working?	1. Hospital 2. Health Center		
203	Regular working department	1. Delivery room 2. ANC 3. PNC 4. Family Planning 5. OPD (Adult &/ Under-five) 88. Others (Specify) -----		
204	Total years of clinical service	_____ (full year)		
205	Ever received training on obstetric Care?	1. Yes 2. No -----	208	
206	Which training did you received?	1. Newborn care 2. BEMONC 3. CEMONC 88. Others		
207	Did you study partograph? (as part of academic education)	1. Yes 2. No		
208	Did you trained to use partograph? (in service training)	1. Yes 2. No		

Part 300: knowledge about partograph (Please tick one for each statement below to indicate your response)

Q. Code	Question (variable)	Response option	Response code
301	What is partograph?	<ol style="list-style-type: none"> 1. A tool to be used only in active phase of labor 2. A graphic methods of recording 1st stage of labor 3. A salient feature of recording the whole process of labor 	
302	What are the components of the Partograph?	<ol style="list-style-type: none"> 1. Assessment of Fetal, maternal wellbeing and assessment of labor progress 2. Assessment of labor and material wellbeing only. 	
303	During attending women in labor, when do you start plotting on the partograph?	<ol style="list-style-type: none"> 1. When labor is diagnosed 2. At 4cm cervical dilatation 3. When complication is detected 4. At 3cm cervical dilatation 	
304	How often is it used once active phase of labor started?	<ol style="list-style-type: none"> 1. Once/30 Minutes 2. Once/Hour 3. Once/4 Hours 4. Once /6 Hours 	
305	Cervical dilation should be plotted on partograph every 4hrs.	<ol style="list-style-type: none"> 1. Yes 2. No 	
306	What is the importance of Partograph	<ol style="list-style-type: none"> 1. It is only used to follow the progress of labor 2. It is used to follow progress of labor, maternal and fetal wellbeing 3. It is used to follow only maternal wellbeing 4. It is only used to follow maternal and fetal wellbeing 	
307	Type of client that needs partograph use	<ol style="list-style-type: none"> 1. prim gravid 2. multi-porous 3. All women in active phase of labor 4. On eclamptic patient 	

Part 400: Attitude toward partograph utilization. (Please tick one for each statement below to indicate your response)

Q. Code	Question (variable)	Response option	Response code
401	To follow women in labor, using partograph is beneficial for the laboring women	1. Strongly disagree 2. disagree 3. Uncertain 4. Agree 5. Strongly agree	
402	The partograph is very favorable as it alert skilled birth attendant of any deviation from normal	1. Strongly disagree 2. Disagree 3. Uncertain 4. Agree 5. Strongly agree	
403	By using a partograph, health care providers are able to identify problems, recognize complications early.	1. strongly disagree 2. Disagree 3. Uncertain 4. Agree 5. Strongly agree	
404	skilled birth attendant must use a partograph on every laboring mother	1. Strongly disagree 2. Disagree 3. Uncertain 4. Agree 5. strongly agree	

405	Using partograph enables health care providers perform essential basic interventions and make referrals to appropriate levels of care when necessary.	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. Uncertain 4. Agree 5. Strongly agree 	
406	Using partograph is not beneficial as the estimate it gives is exaggerated.	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. Uncertain 4. Agree 5. Strongly agree 	
407	Using partograph misleads management as the progress of labor and the partograph alert line are not aligned in most pregnant woman.	<ol style="list-style-type: none"> 1. Strongly disagree 2. Disagree 3. Uncertain 4. Agree 5. Strongly agree 	

Part 500: Assessment of utilization of the partograph

Q. Code	Question about utilization of partograph	Response	Skip	Response code
501	Do you use partograph?	1. Yes 2. No -----	503	
502	How often do you use?	1. Routinely 2. Some times 3. Occasionally		
503	If not using or If “occasionally” or “sometimes” to Q502, what would make difficult to use the partograph routinely when monitoring women in labor? (you can tick more than one option)	1 Non-availability of partograph 2 Shortage of staff 3 Lack of supervision 4 Time consuming to use 5 Lack of training 6 Little or no knowledge 7 Much detail to fill 8. Others		

Section II: Document review checklist

Document review of recently used partograph charts (by using checklist). Please check if the following are recorded on the partograph charts. (Circle **Yes** or **No**)

Parameters	Response	
Are the following patient information recorded?		
Name	Yes	No
Gravida, Para	Yes	No
Card number	Yes	No
Date and time of admission.	Yes	No
Time of membranes ruptured	Yes	No
Are the following information about Labor progress recorded?		
Cervical dilation every 4 hour	Yes	No
Descent of head	Yes	No
Uterine contraction every ten minute	Yes	No
Action taken	Yes	No
Is the following information about the fetus recorded?		
Fetal heart rate every 30 minutes	Yes	No
Color of liquor during every per vaginal examination	Yes	No
Molding of fetal skull	Yes	No
Immediate fetal outcome	Yes	No
Are the following information about maternal conditions recoded		
Maternal pulse rate every 30 minutes	Yes	No
Maternal blood pressure every 4 hour	Yes	No
Maternal temperature every 2 hours	Yes	No
Urine volume, urine protein and ketone every 2-4 hours	Yes	No
Mode of delivery	Yes	No

