

ST. PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE

DEPARTMENT OF PUBLIC HEALTH



**KNOWLEDGE AND UTILIZATION OF PARTOGRAPH AMONG
MIDWIVES DURING MONITORING OF LABOUR IN PUBLIC HEALTH
FACILITIES, ADDIS ABABA, ETHIOPIA**

BY: -YIDIDIA SILESHI (Field Epidemiology Resident Cohort II)

**FEBRUARY, 2018 G.C
ADDIS ABABA, ETHIOPIA**

**KNOWLEDGE AND UTILIZATION OF PARTOGRAPH AMONG
MIDWIVES DURING MONITORING OF LABOUR IN PUBLIC HEALTH
FACILITIES, ADDIS ABABA, ETHIOPIA**

BY: -YIDIDIA SILESHI (Field Epidemiology Resident Cohort II)

ADVISORS

- 1. ELIAS SENBETO (MD, MPH, PhD)**
- 2. Mr. TSEDEK WOLDIE (BSc, MSc)**

**A THESIS REPORT SUBMITTED TO SPHMMC, THE DEPARTMENT OF
PUBLIC HEALTH, IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC
HEALTH IN FIELD EPIDEMIOLOGY**

**FEBRUARY, 2018 G.C
ADDIS ABABA, ETHIOPIA**

SAINT PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE

DEPARTMENT OF PUBLIC HEALTH

APPROVAL SHEET (by advisors and program coordinator)

DECLARATION FORM

LETTER FOR DECLARATION (body of work with thesis)

I, the under signed, declared that this is my bona fide original work, has never been presented in this or any other University, and that all the resources and materials used for the body of work with thesis, have been fully acknowledged.

Student Name: _____

Signature: _____

Date: _____

Place: _____

Date of submission: _____

This body of work with thesis has been submitted for examination with our approval as **Candidate's advisors.**

_____ Name of Primary advisor	_____ Signature	_____ Date
_____ Name of Co-advisor	_____ Signature	_____ Date
_____ Name of FETP Coordinator	_____ Signature	_____ Date

DEPARTMENT OF PUBLIC HEALTH GRADUATE STUDIES

FINAL BODY OF WORK WITH THESIS APPROVAL FORM

As members of the Board of Examiners of the final body of work with thesis open defense, we certify that we have read and evaluated the body of work with thesis prepared by _____ under the title “_____” and recommencement for the ***degree of Master of Public Health in Field Epidemiology***.

_____ Name of the Chairperson	_____ Signature	_____ Date
_____ Name of Primary Advisor	_____ Signature	_____ Date
_____ Name of Co-advisor	_____ Signature	_____ Date
_____ Name of Internal Examiner	_____ Signature	_____ Date
_____ Name of External Examiner	_____ Signature	_____ Date

Final approval and acceptance of the bodywork with thesis is contingent upon the submission of the final both hard and soft copies of the body work with thesis to the department of public health.

Acknowledgement

First, I would like to thank in a very special way my principal advisor Dr.Elias Senbeto and co-advisor Mr.Tsedek Wolde, they worked with me vigorously, thorough guidance, giving constructive comment and encouragement for this thesis report.

Second, I would like to thanks Addis Ababa health bureau and all the three sub cities (Arada,Yeka and Gullele) health office staff for their support before and during data collection time.

At last but not the list, I would like to thanks all my data collectors, and study participants for their patience and hospitality to participate in this study.

TABLE OF CONTENT

Acknowledgement.....	i
TABLE OF CONTENT	ii
Abbreviations and acronyms	iv
List of tables	v
List of figures	vi
Abstract	vii
1. Introduction	1
1.1 Background	1
1.2 Statement of the problem	2
1.3 Significance of the study	4
2. Literature review	5
2.4 Conceptual frame work	7
3 Objectives.....	8
3.1 General Objective.....	8
3.2 Specific Objective	8
4. Materials and methods	9
4.1 Study Setting and design	9
4.2 Study Population with eligibility criteria	10
4.3 Sample size determination	10
4.4 Sampling technique and procedure	10
4.5 Study variable.....	11
4.6 Data collection tool and procedures	12
4.7 Operational definition	12
4.8 Data quality management.....	13
4.10 Data processing and analysis.....	14
4.10 Ethical consideration	14

4.11 Dissemination of result.....	14
5. Result.....	15
6. Discussion	24
7. Limitation of the study	26
8. Conclusion and Recommendation.....	27
Reference.....	28
ANNEX.....	30

Abbreviations and acronyms

AOR	Adjusted Odd Ratio
BEmONC	Basic Emergency Obstetric and Newborn Care
BSc	Bachelor of Science
CI	Confidence interval
CDC	Center of disease control and prevention
COR	Crud Odd Ratio
EDHS	Ethiopian Demographic Health Survey
HCPs	Health Care Professionals
HCW	Health Care Workers
MSc	Masters of Science
NGO	Non-Governmental Organization
OCPs	Obstetric care providers
OR	Odd Ratio
PI	Principal Investigator
PPH	Postpartum Hemorrhage
Ref	Reference
SD	Standard deviation
SPHMMC	St. Paul's Hospital Millennium Medical Collage
SPSS	Statistical package for social science
WHO	World Health Organization

List of tables

Table 1:- Socio-Demographic characteristics of midwives in Addis Ababa, Ethiopia, February 2017 G.C.....	15
Table 2:- Knowledge on partograph among Midwives in Addis Ababa, Ethiopia, February 2017 G.C.....	17
Table 3:- Over all knowledge scores on the partograph among Midwives in Addis Ababa, Ethiopia, February 2017 G.C.....	19
Table 4:- Bivariate and Multivariable analyses of knowledge level about partograph utilization among Midwives in Addis Ababa, Ethiopia, February 2017 G.C.....	20
Table 5:- Relationship between level of knowledge, years of experience, marital status, Gender and partograph availability and partograph utilization among Midwives in Addis Ababa, Ethiopia, February 2017 G.C	21
Table 6:- Utilization of the partograph among Midwives in Addis Ababa, Ethiopia, February 2017 G.C.....	22
Table 7:- Predictors of utilization of partograph among Midwives in Addis Ababa, Ethiopia, February 2017 G.C	23

List of figures

Figure 1:- Conceptual framework for knowledge and utilization of partograph.....	7
Figure 2:- Map of Addis Ababa city administrations, 2017 G.C	9
Figure 3:- Sampling chart to show required sample size Addis Ababa, Ethiopia 2017....	11

Abstract

Introduction:-The majority of maternal deaths and complications attributable to obstructed and prolonged labour could be prevented by health interventions like the use of partograph. It provides a graphic overview of the progress of labour and records information about maternal and fetal condition during labour. Different studies in developing countries depicted that the poor level of knowledge about partograph utilization among health care providers. Therefore, the aim of this study was to assess Midwives knowledge and utilization of the partograph during monitoring of labor in the Public Health Centers of Addis Ababa Region, Ethiopia.

Method: -An institution based cross-sectional quantitative study was carried out among midwives who were working in public health institutions. Simple random sampling was used to select the study area and all midwives in the study area were included to recruit 254 study participants. Structured interviewer administered questionnaire was used. Data was entered and analyzed using SPSS version 22. Descriptive statistics, Bivariate and multiple logistic regression were computed to determine if any relationship between each independent and the outcome variables. Level of significance was determined using 95% CI and statistical significance declared if $p < 0.05$. Independent variables with p -value ≤ 0.2 at the Bivariate were included in the multiple logistic regressions to control potential confounding variables.

Result: -Of the 254 eligible participants, 254(100%) took part in the study. The mean age of the respondent was 29.7 years with $SD \pm 6.5$ years with majority being female 70.1 %. All 254(100%) of the midwives were able to identify the correct definition of the partograph. More than 3/4th of midwives, 227 (89.7 %) had a good knowledge level about partograph and 221 (87 %) routinely used it for monitoring of labour. Knowledge of partograph was significantly higher among midwives whose age ≤ 30 with AOR=2.49(95% CI: 1.06-8.045).

Conclusion: -More than 3/4th of Midwives in this study had a good level of knowledge about partograph utilization. Knowledge level of Partograph was higher among Midwives ≤ 30 years of age. Partograph utilization was higher in female midwives than males and whose age is >30 . Age of the participant is the only variables that had influence on knowledge out of all outcome variables.

Key words: Partograph, Knowledge, Utilization, Addis Ababa,

1. Introduction

1.1 Background

Labor and delivery are unpredictable events, which if not monitored properly can result in a disabled or a fatal state. World Health Organization (WHO) promotes the use of the partograph to monitor and improve the management of labor and to support decision-making regarding interventions [1].

Globally, there were an estimated number of 287,000 maternal deaths in 2010[2]. This means, every day, approximately 800 women die from preventable causes related to pregnancy and childbirth [2]. However, in 2015 global estimates from WHO showed that there were 216 maternal deaths per 100,000 live births. Approximately 99% of these global maternal deaths occurred in developing regions with sub-Saharan Africa accounting for roughly 66 %[3]. About 99% of maternal deaths occur in developing countries, while more than half of these deaths occur in sub-Saharan Africa, most could have been prevented[4].

According to United Nation estimates, Ethiopia has so far reduced maternal mortality by 69% from the 1990 estimate with annual reduction rate of 5% or more. According to the latest UN estimate, the proportion of mothers dying per 100,000 live births has declined from 1400 in 1990 to 420 in 2013. Another report from Lancet (2014) estimated that maternal mortality was 497 in 2013. In addition, Ethiopian Demographic Health survey (EDHS) 2011 and 2016 reported maternal mortality rate of 676 and 412 per 100,000 live births respectively, indicating great change between the two surveys. Significant variation in estimating maternal mortality observed in different studies, calling for more robust and locally generated information. However, a reduction was observed in maternal mortality in all the studies with different magnitude of reduction [5].

The majority of maternal deaths and complications attributable to obstructed and prolonged labour could be prevented by cost-effective and affordable health interventions like the use of partograph [6]. It comes as a printed one-page form on which labour observation is recorded. It provides a graphic overview of the progress of labour and records information about maternal and fetal condition during labour. It also allows early identification and diagnosis of pathological

labour. Additionally, its use is critical in preventing maternal and prenatal morbidity and mortality [7].

In addition, it is valuable appropriate technologies in use for improved monitoring of labour progress, and maternal and fetal wellbeing. It is an important tool for managing labor. This is through enabling midwives, nurses and doctors to record their examination findings on a standardized form, which generates a pictorial overview of labour progress, and maternal and fetal condition, which allows for early identification and diagnosis of pathological labor. Its use is critical in preventing maternal and prenatal morbidity and mortality and therefore has applicability in developed and developing world settings [8].

Most Partograph have three distinct sections where observations related to maternal condition, fetal condition and labour progress are recorded [5]. A Partograph has clear demarcations which, if arrived at or exceeded clearly indicate the need to address existing or imminent complications like poor progress of labour, prolonged labour, fetal distress, and in the worst cases, obstructed labour and ruptured uterus. Early detection of prolonged labour greatly contributes to prevention of obstructed labor and other related complications such as postpartum hemorrhage (PPH), ruptured uterus, puerperal sepsis and obstetric fistula [9]. The Partograph provides health professionals with a pictorial overview of the labour to allow early identification and diagnosis of the pathological labour [10].

Despite the WHO recommendation that order partograph should be used to monitor all labor, still it is not widely used in Africa or elsewhere in the developing world. In many countries where it has mandated without proper training, the partograph serves only as a record of labor (completed after the baby is born) and not as a tool to guide decision making during labour[7].

1.2 Statement of the problem

The federal ministry of health of Ethiopia recommended the utilization of the new modified WHO partograph during the care given for laboring mother [11]. It designed for early detection of abnormal progress of labor and prevention of prolonged labor in order to reduce risk of Postpartum Hemorrhage (PPH), sepsis, obstructed labor and its sequels such as ruptured uterus and obstetric fistula [7].

The government of Ethiopia promotes the routine use of the partograph to monitor the progress of labour in all settings by giving short term and long-term training, like BEmONC and emergency surgery in MSc level, for midwives and different health professionals. Therefore, Midwives at all levels are expected to know how to correctly use and interpret the partograph, which will in turn significantly reduce them maternal and fetal death. Although the partograph is a simple and inexpensive tool, which has been proven to effectively, prevent maternal deaths and the ensuing complications due to obstructed or prolonged labour, it is not as widely implemented, as it should be.

Study conducted in Addis Ababa, Ethiopia indicated that 100% of the participants knew what the partograph is. However, only 53.3 % of the respondents were able to explain the function of alert line [12]. While only about fifty percent of the participants could correctly explain the function of alert line, considerable number of participants (82.6%) correctly explained about the function of action line. The result of this study has also shown that 96.6% of the participants could mention at least one components of the partograph. While more than half (52.3%) of the participants had fair knowledge, slightly higher than one-third (39%) of them had good knowledge about the partograph. Working in public health centers had shown significant association with good knowledge of the partograph [12].

There are several factors affecting the utilization of the partograph includes poor knowledge , non-availability of formats/graphs ,an additional task for in adequate staff ,lack of understanding the relevance of the partograph in preventing obstructed labour[16]. Therefore, the aim of this study is to fill the gap concerning knowledge and utilization of partograph by assessing the knowledge and utilization of partograph among midwives during monitoring of labour in public health centers, Addis Ababa

1.3 Significance of the study

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. Therefore, having good knowledge about the use of partograph among obstetric caregiver is crucial. I believe this study: -

- Will provide valuable insights about the status of knowledge among midwives about the partograph
- Will give important information for further research
- Result will be important to inform policies and strategies in provision of maternity care services

2. Literature review

2.1 Globally

Labor and delivery are unpredictable events, which if not monitored properly can result in a disabled or a fatal state. World Health Organization (WHO) promotes the use of the partograph to monitor and improve the management of labor and to support decision-making regarding interventions [1]

There were an estimated number of 287,000 maternal deaths in 2010 G.C [2]. This means, every day, approximately 800 women die from preventable causes related to pregnancy and childbirth [2]. In 2015 G.C, global estimates from the WHO showed that there were 216 maternal deaths per 100,000 live births. Approximately 99% of these global maternal deaths occurred in developing regions with sub-Saharan African counting for roughly 66% [3].

2.2 Africa

About 99% of maternal deaths occur in developing countries, while more than half of these deaths occur in sub-Saharan Africa, most could have been prevented [4].

Prolonged labor is a leading cause of death among mothers and newborns in the developing world. If her labor does not progress normally, the woman may experience serious complications such as obstructed labor, dehydration, exhaustion, or rupture of the uterus. Prolonged labor may also contribute to maternal infection or hemorrhage and to neonatal infection [13]. Obstructed labor results from a disproportion between the fetal presentation and the mother's pelvis. The most recent statistics from the WHO show that 8% or 42,000 of all maternal deaths caused by obstructed labor [2].

Studies conducted in Kenya have reported a significant gap between knowledge and practice. One study from the University of Nairobi showed that while 88.2% of the 1057 evaluated patient records contained a partograph, only 23.8% of the forms had been used correctly [14].

The study conducted in Cameroon also reveals that about one-third(31.0%) of there spondents had poor knowledge on the partograph,(39.4%) had fair knowledge while only little higher than

quarter (29.6%) of our participants were found to have good knowledge on the partograph and more females(31.1%) had good knowledge on the partograph than males (20.0%) [15].

2.3 Ethiopia

According to UN estimates, Ethiopia has so far reduced maternal mortality by 69% from the 1990 estimate with annual reduction rate of 5% or more. According to the latest UN estimate, the proportion of mothers dying per 100,000 live births has declined from 1400 in 1990 to 420 in 2013. Another report from Lancet (2014 G.C) estimated that maternal mortality was 497 in 2013. In addition, EDHS 2011 G.C and 2016 G.C reported maternal mortality rate of 676 and 412 per 100,000 live births respectively, indicating great change between the two surveys. Significant variation in estimating maternal mortality observed in different studies, calling for more robust and locally generated information. However, a reduction observed in maternal mortality in all the studies with different magnitude of reduction [5].

Study conducted in Addis Ababa, Ethiopia also revealed similar trends in knowledge and utilization of the partograph. The study indicated that 100% of the participants knew what the partograph is. However, only 53.3 % of the respondents were able to explain the function of alert line [12]. While only about fifty percent of the participants could correctly explain the function of alert line, considerable number of participants (82.6%) correctly explained about the function of action line. The result of this study has also shown that 96.6% of the participants could mention at least one components of the partograph. While more than half (52.3%) of the participants had fair knowledge, slightly higher than one-third (39%) of them had good knowledge about the partograph. However, the reported utilization rate of the partograph was relatively good, 57.4 % [12].

.

2.4 Conceptual frame work

As shown in the (figure 1) below not using the partograph during labor usually occurred because of inter play of different factors which have different degree of effect. Socio demographic factors most likely to act through a number of other inter related factors including organizational and individual behavioral factor all this factors were adopted from previous articles [1, 12, and 13]

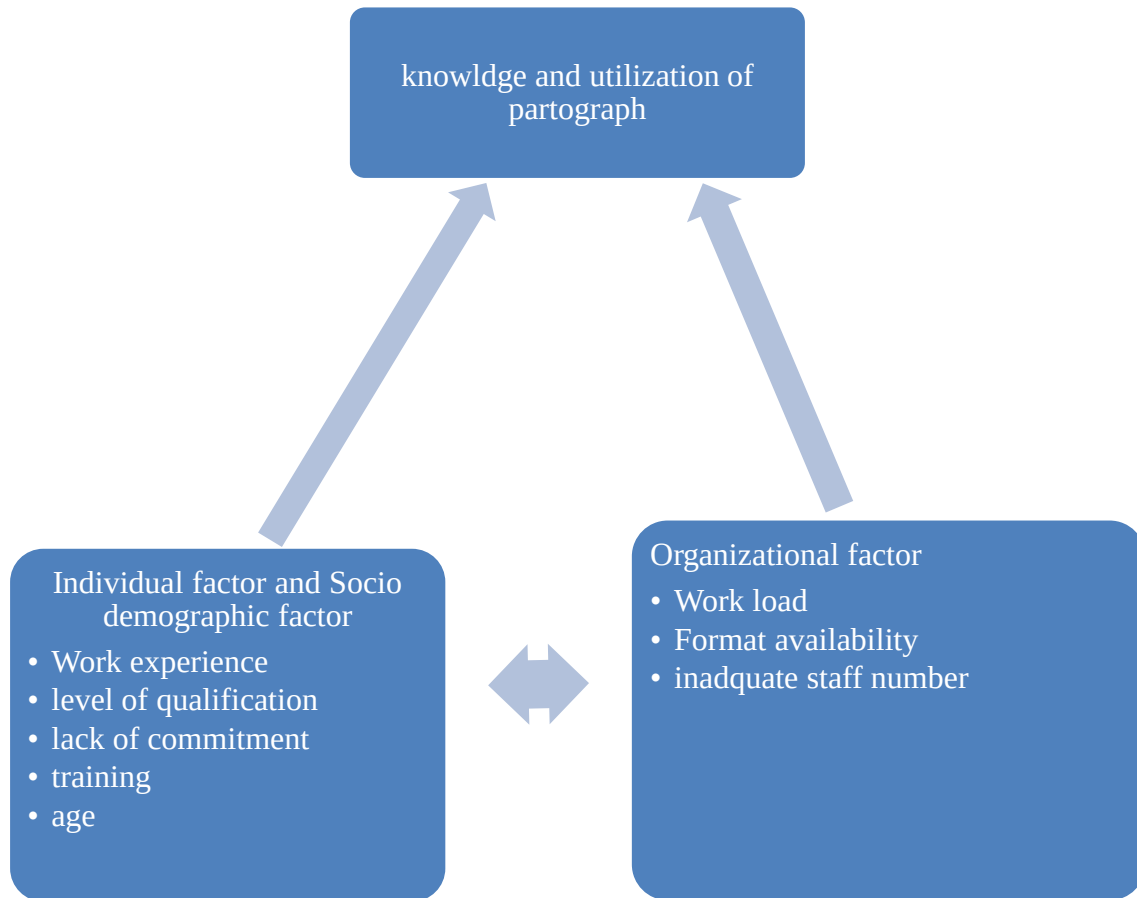


Figure 1:- Conceptual framework for knowledge and utilization of partograph

3 Objectives

3.1 General Objective

- To assess Midwives knowledge and their utilization of the partograph during monitoring of labour in public health facilities, Addis Ababa

3.2 Specific Objective

- To find out the level of knowledge of midwives how to use partograph during monitoring of labour
- To assess Utilization of partograph by midwives
- To determine the association b/n the utilization of partograph with knowledge and selected variables
- To identify factors associated with non utilization of partograph

4. Materials and methods

4.1 Study Setting and design

The study conducted from October 22-December 8, 2017 G.C 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 10 sub cities and 117 Woredas (lowest administrative units in Addis Ababa). Addis Ababa is located at 9° 10' 48" North and 38° 44' 02" East and the total land area is 54,000 hectares. Its average elevation is 2,500 m above sea level, and hence has a favorable climate and moderate weather conditions. There are around 752 midwives currently working in 94 functional public health centers. Health institution based quantitative cross sectional study design was used from October 22-December 8, 2017 G.C

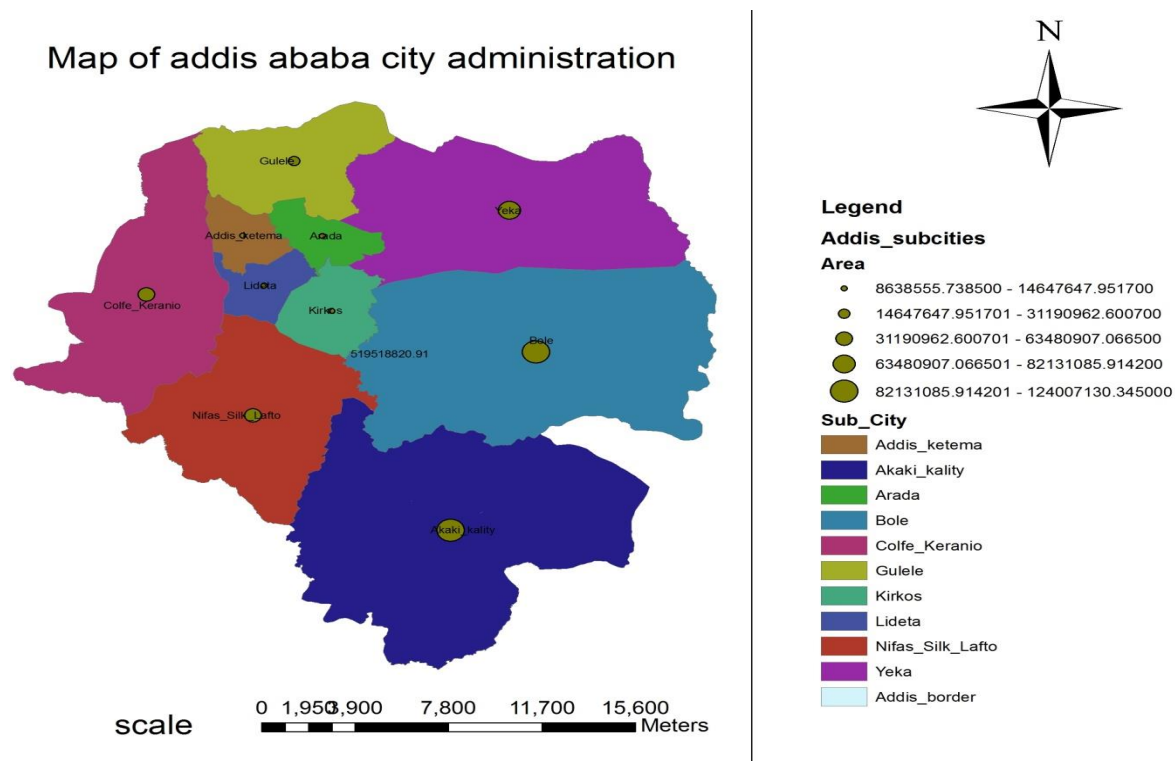


Figure 2:- Map of Addis Ababa city administrations, 2017 G.C

4.2 Study Population with eligibility criteria

Midwives found in 10 sub cities were selected, as source population and those who were working in three-selected sub cities of Addis Ababa was the study population.

Inclusion criteria: Midwives who working in maternity and delivery unit of selected health centers.

Exclusion criteria: Midwives who were not on duty during data collection and those who were not volunteering to participate in the study

4.3 Sample size determination

The total number of public health center in Addis Ababa is 94. All of these institutions are giving obstetric care services. The total midwives who have been providing obstetric care in these 94 institutions are 752(Data obtained from Addis Ababa Health bureau).All Health Centers that provide obstetric care services were included in the study since the total number of Midwives working in delivery units in the study area were small.

The sample size in this cross-sectional study was determined using a single proportion formula.

$$n = \frac{[Z_{\alpha}^2 * P * (1-P)]}{d^2}$$

The minimum sample size required for the study estimated to be **334** using the above formula. where n is the sample size, z is the standard normal deviate set at **1.96** (for 95% confidence level), d is the desired degree of accuracy (taken as **0.05**). P is the estimate of the proportion of our target population who use partograph is **32.2 % (8)**. The finite population nf = no/1+(no/N). where nf is the final sample size, no is the initial sample size and N is the total number of midwives in public health institutions of Addis Ababa was used as the total number of health professionals working in the maternity units of public health institutions of the study area was less than **10,000**. Consequently, the corrected sample size became **231**. With 10% rate of non-responses, the final sample size was **254**

4.4 Sampling technique and procedure

There are around 752 midwives working currently in 94 functional health centers in Addis Ababa. All 94 functional Health Centers are distributed in 10 sub cities of Addis Ababa. Since our final sample size was 254 midwives, we select 3-sub cities by random sampling methods.

There are around 31 Public Health Centers found in selected sub cities then we include all Midwives found in 3 selected sub cities.

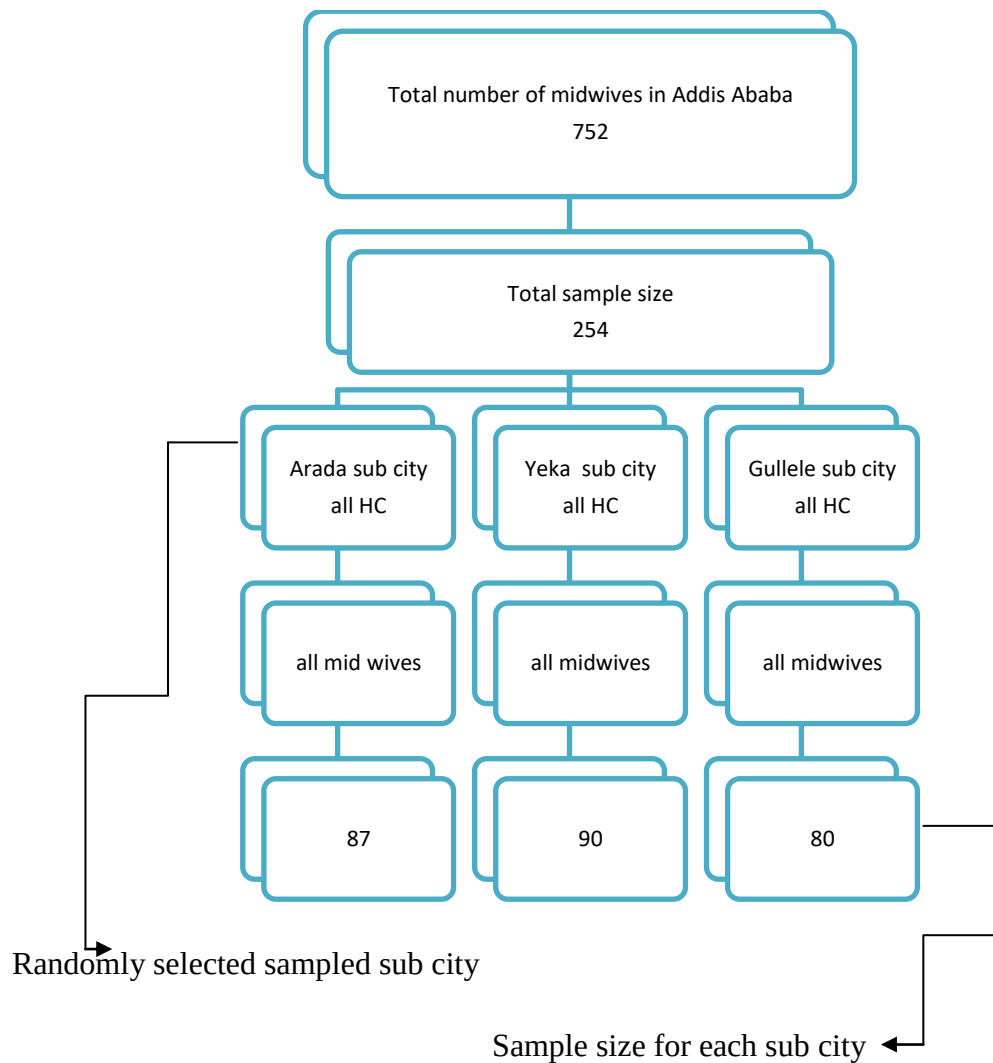


Figure 3:- Sampling chart to show required sample size Addis Ababa, Ethiopia 2017

4.5 Study variable

Dependent variable; knowledge and utilization of partograph

Independent variables:

- Socio demographic factor
- Work load

- year of experience
- level of qualification
- training

4.6 Data collection tool and procedures

Structured interviewer administered questionnaires were used for data collection. Questionnaires were adapted and modified from related articles to collect data through structured interviewer administered questionnaire [8]. The instrument was pretested on 25 Midwives who were working in other public health centers. Findings from the pretest were used to modify the instrument.

A total of eight Nurses and two public health officers were recruited to conduct the face-to-face interviews. Training was given to the data collectors and field supervisors before the actual data collection regarding the aim of study, the data collection tool and procedures going through the interview question by question. In addition, the training also focused on the art of interviewing and clarifying questions that would unclear to the respondents. The principal investigators assisted the supervision process.

The questionnaire mainly focused on socio-demographic characteristics, qualification of midwives, year of experience, knowledge and utilization of partograph and previous obstetric care training. Nurses and Public Health Officer collected the data. All selected data collectors have Bachelor of Science degree in their perspective professions to enhance the quality of the data. The principal investigator and supervisors make on site supervision during the whole period of data collection. After each day of data collection, the data were visually checked for completeness and consistency by holding a meeting with the data collectors

4.7 Operational definition

Knowledge: - Awareness of midwives about the content of partograph and its use.

Utilization: - the use of partograph by midwives during assisting delivery.

Health care professionals: are defined as persons (e.g., employees, attending clinicians, Health officer, Nurse, Midwife, laboratory personnel) whose activities involve contact with patients or with blood or other body fluids from patients in a health-care, laboratory, or public-safety

setting. The potential exists for blood and body fluid exposure to other workers, and the same principles of exposure management could be applied to other settings.(CDC, 2001)

Level of qualification: the level of qualification indicates midwives who have BSc degree, Diploma . . . etc

4.8 Data quality management

4.8.1 Data quality control

To assure quality of the data the following measures was undertaken: the data collectors gave a brief orientation about the whole purpose of the research work for all study participants. One day intensive training was given for two supervisors and eight data collectors by the principal investigator. The principal investigator supervised overall activity during data collection. After data collection completed, each questionnaire visually checked for their completeness, missing values, and then manually cleared up. During data analysis, sorting was used to check for missed variables and other errors.

4.9 Scoring method of Knowledge of midwives

Acknowledge scoring system was developed in order to produce more objective assessment of midwives knowledge of partograph. Based on this system a "knowledge score" was obtained via assessment with 24 composite questions the over all knowledge scores respondents with score ≤ 15 categorized as having **poor knowledge**; those who scored between 16 and 19 considered as having **fair knowledge** while those with scores ranging 20 to 24 categorized as having **good knowledge**.

In order to assess the factor associated with good knowledge, the participants were divided in to two group, midwives with "poor-to-fair knowledge (score < 20)" and those with "good knowledge (score greater than or equal to 20)"

Similarly, we divide the participants in to two groups "routinely" who use it always and "not routinely" (never, rarely, sometimes, and often) in order to investigate the factor associated this of partograph. (ANNEX II)

4.10 Data processing and analysis

Collected data were checked for completeness and consistency, coded then entry and analysis was performed using SPSS version 22. Descriptive statistics was done to compute frequency, percentage, mean, standard deviation and median of independent and dependent variable accordingly. Bivariate and Multivariable logistic regressions analysis were carried out to assess the relationship between independent variable and the midwives knowledge and the use of partograph. Statistically significant association was declared if P value <0.05 at 95% CI. Binary logistic regression analysis carried out to assess the effects of explanatory variables and to control the effect of confounders. Independent variables with *p*-value less than or equal to 0.2 at the Bivariate analysis was included in the Binary logistic regression for the dependent variables to control potential confounding variables.

4.10 Ethical consideration

Ethical clearance requested to institutional review board of St. Paul's Hospital millennium medical college. After the ethical approval, written consent submitted to AACAHB, selected sub cities and verbal consent requested to all the participants during data collection. Those who are unwilling to participate in the study will not be included in the study. To ensure confidentiality names and other identifying information not included.

4.11 Dissemination of result

Result of this study submitted to St. Paul Hospital Millennium Medical Collage/Department of Public health and AACAHB by hard copy and electronic soft copy and will be presented to all concerned body.

5. Result

5.1:-Socio-demographic characteristics of study participants

During the study period, 254 Midwives were working in the maternity units of selected health centers, all 254 Midwives were consented to the study and the interviewer administered the questionnaires to them. All 254 questionnaires were returned and the response rate was 100%. The mean age of the midwives were 29.47 years with $SD \pm 6.5$ years and The median age were 27 years (range: 22–54 years). There were a female predominance (70.1%) and (29.9 %) of the midwives were male. Among the midwives 116 (45.7%) were married and 138(54.3%) of them were single. The mean length of practice was 5.3 with $SD \pm 4.39$ years (range: 0± 24 years), Two hundred twenty four midwives (88.2%) had been practicing for ≤ 10 years.

Table 1:- Socio-Demographic characteristics of midwives in Addis Ababa, Ethiopia, February 2017 G.C

Variable	Frequency of respondents	Percentage (%)	Mean $\pm$ SD
Age			
20-29	183	72%	29.47 $\pm$ 6.5 years
30-39	53	20.9%	
40-49	16	6.3%	
≥ 50	2	2%	
Total	254	100%	
Sex			
Male	76	29.9%	
Female	178	70.1%	
Total	254	100%	
Marital status			
Married	116	45.7%	
Single	138	54.3%	
Total	254	100%	

Religion		
Christian	183	72%
Muslim	63	24.4%
Other	9	3.6%
Total	254	100%
Level of Qualification		
BSc	87	34.3%
Diploma	159	62.6%
Level II and Level IV	8	3.1%
Total	254	100%
Year of experience		
≤ 10	224	88.2%
> 10	30	11.8%
Total	254	100%

5.2:- Midwives Response on Knowledge question of Partograph

Two hundred fifty four (100%) of the midwives were able to identify the correct definition of the partograph as a simple graphic recording of labour and salient conditions of the mother and fetus against time in hours. Similarly, 57.1 % regarded it as a complex tool with pictorial overview of labour for use by midwives. The midwives knowledge on the partograph as a preventive tool showed that 100%, 98 % and 98 % of respondents thought its use would reduce maternal mortality; reduce maternal morbidity and increase the efficiency of those attending to women in labour respectively.

Knowledge of graphic representation of normal labour was good. Among the midwives, 84.6 % of them correctly stated that in the normal progress of labour, the graph/plot on the partograph should fall to the left of the alert line. Two hundred twelve (83.5%) of the midwives knew that the action line indicates that it is time for the woman to be adequately re-assessed for appropriate intervention.

With respect to the characteristics of contractions and progress of labour, less than 2.8 % did not agree that the progress of labour is assessed by the degree of cervical dilatation and descent of the presenting part. Two hundred twenty four (88.2%) of midwives were agreed that 10 minutes is required to effectively assess the adequacy of contractions.

Midwives knowledge about assessment made with the partograph during labour showed that most midwives indicated that the partograph can be used in detecting prolonged labour(100%), poor progress of labour (99.2%), need for caesarean-section(99.6%)and 93.7% knew about maternal dehydration as an assessment that could be inferred from the partograph. Overall knowledge on the use of the partograph to detect and manage feto-maternal complications was good. The table below shows that more than 93.7 percent of the midwives could diagnose maternal and fetal complications using the partograph

Table 2:- Knowledge on partograph among Midwives in Addis Ababa, Ethiopia, February 2017 G.C

Respondents Response	Frequency		
	Yes	No	Unknown
On definition of partograph			
A chart developed by midwives in developed countries to monitor labour	149(58.7%)	79(31.1%)	26(10.2%)
A complex tool with pictorial overview of labour for use by midwives	145(57.1%)	94(37%)	15(5.9%)
A chart for monitoring labour by doctors	116(45.7%)	118(46.6%)	20(7.9%)
A simple graphic recording of labour and salient conditions of them other and fetus against time in hours	254(100%)	0	0
On the benefits of use of Partograph			
Will reduce maternal morbidity	249(98%)	4(1.6%)	1(0.4%)
Will reduce maternal mortality	254(100%)	0	0
Will reduce neonatal morbidity	250(98.4%)	3(1.2%)	1(0.4%)
Will reduce neonatal mortality	254(100%)	0	0

Will increase the efficiency of those attending to women in labour	259(98%)	5(2%)	0
Is mandatory for improved quality of care of a woman in labour	251(98.8%)	2(0.8%)	1(0.4%)
Graphic representation of normal labour			
1. Function of the alert line			
The graph on the partograph should fall to the left of the alert line	215(84.6%)	31(12.2%)	8(3.1%)
The graph on the partograph should fall to the on the alert line	163(64.2%)	85(33.5%)	6(2.4%)
The graph on the partograph should fall to the right of the alert line	117(46.1%)	129(50.8%)	8(3.1%)
2. Function of action line			
Indicates appropriate action must be taken	240(94.5%)	9(3.5%)	5(2.0%)
Time for the woman to be adequately re-assessed for appropriate intervention	212(83.5%)	39(15.4%)	3(1.2%)
Continuous observation till delivery	208(81.9%)	39(15.4%)	7(2.8%)
On characteristics of normal labour			
Three/four contractions in every 10 minutes is normal	230(90.6%)	20(7.9%)	4(1.6%)
Minimum duration of a strong contraction is 40 seconds	197(77.6%)	51(20.1%)	6(2.4%)
You require 10 minutes to effectively assess adequacy of contractions	224(88.2%)	19(7.5%)	11(4.3%)
Progress of labour is assessed by the degree of cervical dilatation and descent of the presenting part	243(95.7%)	7(2.8%)	4(1.6%)
Labour is prolonged when it lasts more than 12 hours	214(84.3%)	24(9.4%)	16(6.3%)
On detection of feto-maternal complications			
Prolonged labour	254(100%)	0	0
Obstructed labour	249(98%)	5(12%)	0
Poor progress of labour	252(99.2%)	2(0.8%)	0

Inefficient uterine contraction	249(98%)	5(2%)	0
Suspected foetal distress	248(97.6%)	5(2%)	1(0.4%)
Abnormal FHR	251(98.8%)	2(0.8%)	1(0.4%)
Satisfactory progress of labour	253(99.6%)	1(0.4%)	0
Need for labour augmentation	252(99.2%)	2(0.8%)	0
Need for Caesarean delivery	253(99.6%)	1(0.4%)	0
Dehydration in mother	238(93.7%)	13(5.1%)	3(1.2%)

5.3:-Overall knowledge score of participant

Overall, the knowledge scores ranged between 16 and 24, with a mean score of 22.43 with $SD \pm 1.796$. About twenty-seven (10.6%) of midwives had fair knowledge and 227(89.4%) had good knowledge level about the partograph as shown below.

Table 3:- Over all knowledge scores on the partograph among Midwives in Addis Ababa, Ethiopia, February 2017 G.C

Outcome	Respondents	Mean $\pm$ SD
Good	227(89.4%)	22.43 $\pm$ 1.796
Fair	27(10.6%)	
Poor	0(0%)	
Total	254(100%)	

Table 4: shows the association of some selected variables, which were tested for association with good knowledge of the partograph by these midwives.

On Bivariate analysis Midwives, whose age ≤ 30 were about 2.2 times more likely to have good level knowledge on the partograph than those whose age were greater than 30 [**COR=2.28 (95% CI: 1.068-6.14)**]. This finding was significantly associated with good level of knowledge on Bivariate analysis (**p-value=0.045**). Its association also remained significant after adjustment for possible confounding variables using Binary logistic regression [**AOR=2.49(95% CI: 1.066-**

8.002). None of the other variables tested were found to be associated with good knowledge of the partograph in bivariate analysis.

Table 4:- Bivariate and Multivariable analyses of knowledge level about partograph utilization among Midwives in Addis Ababa, Ethiopia, February 2017 G.C

Variables	Knowledge level		COR	AOR	p-value
	Good	Fair			
Age					
≤ 30	168(74%)	15(55.6%)	2.28 (1.068-6.14)	2.49(1.066-8.002)	0.045*
> 30	59(26%)	12(44.4%)	1	1	
Gender					
Male	68(30%)	8(29.6%)	1.016 (0.556-3.05)	0.955(0.384-2.378)	0.921
Female	159(70%)	19(70.6%)	1	1	
Marital status					
Married	102(44.9%)	14(51.9%)	0.758 (0.341-1.68)	0.911 (0.370-2.245)	0.840
Single	125(55.1%)	13(48.1%)	1	1	
Level of qualification					
BSC	81(36%)	6(22.2%)	1.942 (0.753-5.00)	2.778 (0.982-7.859)	0.054
Diploma and level	146(64%)	21(77.8%)	1	1	
Previous training					
Yes	164(72.2%)	18(66.7%)	1.303(0.556-3.04)	1.543(0.635-3.750)	0.328
No	63(27.8%)	9(33.3%)	1	1	
Year of experience					
≤ 10	202(98%)	22(81.5%)	1.836 (0.639-5.28)	1.391(0.378-5.112)	0.620
> 10	25(11%)	5(18.5%)	1	1	
*=statistically significant at 95% CI, p <0.05; 1= reference					

5.4:-Utilization of partograph among Midwives in public health centers

Two hundred fifty four midwives (100%) use the modified WHO partograph to monitor women in labour in public health institutions of Addis Ababa, Ethiopia. Among those who uses partograph, 221(87%) used it routinely while 32(12.6%) and 1 (0.4%) of the midwives used it often and sometimes respectively.

Table 5:- Relationship between level of knowledge, years of experience, marital status, Gender and partograph availability and partograph utilization among Midwives in Addis Ababa, Ethiopia, February 2017 G.C

Characteristics	Utilization of partograph		Total %	Chi-square	p-value
	Routine(N=221)	Non-routine (N=33)			
Knowledge of partograph					
Good	201(88.5%)	26(11.5%)	254(100%)	4.47	0.034
Poor-to-Fair	20(74.1%)	7(25.9%)	27(100%)		
Year of experience					
≤ 10	201(89.7%)	23(10.3%)	224(100%)	12.45	<0.001
> 10	20(66.7%)	10(33.3%)	30(100%)		
Marital status					
Married	95(81.9%)	21(18.1%)	116(100%)	4.934	<0.026
Single	126(91.3%)	12(8.7%)	138(100%)		
Gender					
Male	74(97.4%)	2(2.6%)	76(100%)	10.298	<0.001
Female	147(82.6%)	31(17.4%)	178(100%)		

5.5:-Reasons for non-routine utilization of partograph

Among midwives who had awareness on the partograph but does not used it routinely in monitoring of labour, gives the following reasons as work load 17(6.7%), lack of adequate number of personnel 7(2.8%), time consuming 6(2.6%), easier to manage labour without the use of the partograph 2(0.8%).

Table 6:- Utilization of the partograph among Midwives in Addis Ababa, Ethiopia, February 2017 G.C

Variable	Frequency
Frequency of utilization (n=221)	
Always	221(87%)
Often	32(12.6%)
Sometimes	1(0.4%)
Reason for non routine utilization (n=33)	
Little or no knowledge	1(0.4%)
Shortage of staff	7(2.8%)
Time-consuming	6(2.4%)
Easier to manage labour without use of the partograph	2(0.8%)
Work load	17(6.7%)
<i>(Non-routine*) means both who use partograph *Often* and *Sometimes*</i>	

5.6:-Determinants of routine utilization and good knowledge of the partograph

Being female with (AOR 6.53;95% CI 1.479 - 28.835) and being midwives > 30 years of age with (AOR 3.001; 95% CI 1.216-7.401) are important predictor of the utilization of partograph among midwives.

Table 7:- Predictors of utilization of partograph among Midwives in Addis Ababa, Ethiopia, February 2017 G.C

Characteristics	Utilization		COR	AOR	P-value	95% CI
	Non-routine N=33	Routine N=221				
Knowledge of partograph						
Good	26(11.5%)	201(88.5%)	2.7	0.433	0.116	0.153-1.229
Poor-to-Fair	7(25.9%)	20(74.1%)		1		1
Year of experience						
≤ 10	201(89.7%)	23(10.3%)		1		1
> 10	20(66.7%)	10(33.3%)	0.229	1.902	0.247	0.640-5.655
Age						
≤ 30	169(76.5%)	14(42.4%)		1		1
> 30	52(23.5%)	19(57.6%)	4.4	3.001	<0.017*	1.216-7.401
Marital status						
Married	95(81.9%)	21(18.1%)		1		1
Single	126(91.3%)	12(8.7%)	2.31	0.742	0.499	0.317-1.751
Gender						
Male	74(97.4%)	2(2.6%)		1		1
Female	147(82.6%)	31(17.4%)	0.128	6.53	<0.013	1.479-28.835
Qualification level						
BSc	73(83.9%)	14(16%)		1		1
Diploma	148(88.6%)	19(11.3%)	0.67	0.812	0.629	0.349-1.890
Training						
Yes	154(84.6%)	28(15.3%)		1		1
No	67(93%)	5(6.9%)	2.43	0.382	0.072	0.134-1.088
*=statistically significant at 95% CI, p <0.05; 1=reference						

6. Discussion

This study focused on Midwives in public health centers of Addis Ababa, Ethiopia, who works in maternity and delivery units. The study participants were selected from health centers. Findings we got from this study may be regarded as insight that provides a quick look into current knowledge base and the Obstetric care practice within the study area. This study reveals that there were more females (70%) had good knowledge on the partograph than males (30%).however, it is not statistically significant. It could be assumed that females are closer to obstetric information and are more likely to become midwives than males. The higher numbers of females in this study may also be a contributory factor.

In this study, all 254 (100%) respondents knew what a partograph was and from the respondents 27 (10.6%) had fair knowledge of the partograph while 227 (89.4%) of them had good knowledge of it. This result shows that knowledge of Midwives on partograph may be adequate for better utilization of partograph in public health centers. The knowledge score in this study is better than study done concerning obstetric caregiver in Addis Ababa [12], in which more than half of the respondents had fair knowledge of the partograph, while less than one-third of them had a good knowledge of it. This result also better than the study conducted in North Shoa, Ethiopia [17] in which (71.2 %) of obstetric care providers had a good level of knowledge about partograph utilization, this may be due to in Addis Ababa almost all of the obstetric care providers are Midwives.

Knowledge of the function of alert line compared with action line was fair. 215 (84.6%) of the respondents could explain the function of alert line while 240 (94.6%) of the respondents could explain the function of action line, which may indicate that attention should be taken to improve the knowledge of Midwives on the partograph through training and seminars in order to maximize the utilization and proper use of the partograph. This result, however, shows higher figure compared with a study done in Addis Ababa [12] in which about 104 (53.3%) of the respondents could explain the function of alert line while 161 (82.6%) could explain the function of action line. This could be because all respondents in this study were midwives. It could also be due to a number training given to Midwives concerning maternity.

There is an evidence of significant association between age of the participant and level of knowledge of components of the partograph. The odds of having good knowledge about

components of the partograph were higher among participants whose age is ≤ 30 than those whose age is > 30 , this result is similar with the study conducted in East Gojjam Zone, Ethiopia [18]. This observation could be explained by the fact that, Midwives who are under 30 are closer to any up to date medical information than Midwives who are above 30 years of age and perhaps it may be because most of the participants were under 30 years of age in this study. Sex and year of experience has shown no difference with knowledge of components of the partograph and this result the same with the study conducted in [12, 15]. Previous training also has shown no difference with knowledge of components of the partograph in this study, which is similar with the study conducted in [15].

In this study, the utilization of partograph by Midwives during monitoring of labour was good, which is, among all the respondents 221(87%) of them uses partograph always, 32(12.6%) uses often and only 1(0.4%) respondent uses some times. In general, this study indicates that the partograph utilization rate among midwives was 87 % which is higher than 65.9% recorded by Thomas U. Agan et al [19], the study conducted in Calabar Teaching Hospital, Calabar, Nigeria and 57.4% recorded by EngidaY. et al[12], in a public health institution in Addis Ababa, Ethiopia. This difference may be due to in both studies, the participants were selected from all obstetric health care provider while in our study we focused on only midwives. In the health centers Midwives use the partograph regularly to identify abnormal labour patterns early and arrange for the timely referral to higher health institution though what is required is that all health facilities should regularly use the partograph to monitor mothers in labour.

All 254(100%) of the midwives in our study agreed that the use of the partograph could prevent prolonged labour and facilitate early referral to specialized health facilities. This goes in line with the findings that showed the partograph to be an effective tool for monitoring labour and identifying women in need of an obstetric intervention [12]. WHO had also showed in its safe motherhood program that the partograph is effective in reducing prolonged labour, in reducing rate of labour augmentation, in reducing rate of caesarean sections and also in reducing the number of still births .

7. Limitation of the study

The limitations of this study could include the following. 1. Since this study did not include observation of the use of partograph, there might be respondent bias, in which may the Midwives who took part in this study to overstate their use of the partograph. 2. As this study include only Midwives working in public health facilities of Addis Ababa, Ethiopia, it may be difficult to generalize for Midwives working in private health facilities based on this finding.

8. Conclusion and Recommendation

More than $3/4^{\text{th}}$ of the Midwives in this study had a good level of knowledge about partograph utilization. Partograph knowledge was higher among Midwives ≤ 30 years of age. Age of the participant is the only variables that had influenced knowledge of all outcome variables. Partograph utilization was higher in female midwives than males. Health centers should give up to date training for Midwives whose age is > 30 years to improve their knowledge about partograph hand on job supervision should be undertaken by the respective health facilities to improve utilization of partograph. Any one interested to do research on utilization of partograph he will get best result if his research include observational study.

Reference

1. Fantu Abebe, Dereje Birhanu, Worku Awoke, Tadesse Ejigu. Assessment of Knowledge and Utilization of the Partograph among Health Professionals in Amhara Region, Ethiopia. *Science Journal of Clinical Medicine*. Vol. 2, No. 2, 2013, pp. 26-42. doi: 10.11648/j.sjcm.20130202.11)
2. WHO, UNICEF, UNFPA and the World Bank: Trends in Maternal Mortality 1990 to 2010. Estimates Developed by WHO, UNICEF, UNFPA and the World Bank. Geneva: World Health Organization; 2012.].
3. Trends in maternal mortality:1990 to 2015:estimates byWHO,UNICEF,UNFPA,World BankGroup and the United Nations Population Division).
4. Central Statistical Agency Ethiopia and ICF International: Ethiopia Demographic and Health Survey 2011, Addis Ababa. Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ICF International; 2012
5. FMOH Ethiopian Health Sector Transformation Plan2015/16 - 2019/20 (2008-2012 EFY) August2015
6. Magon N:Partograph Revisited.*International Journal of Clinical Cases Investig* 2011,3:1–2]
7. Markos and Bogale*Reproductive Health* (2015) 12:81 DOI 10.1186/s12978-015-0074-z]
8. Fawole AO, Hunyinbo KI, Adekanle DA:Knowledge and Utilization of thePartograph among obstetric care givers in South West Nigeria.*Afr ReprodHealth*2008,12:22–29.].
9. Mathai M:Thepartograph for the prevention of obstructed labor.*ClinObstet Gynecol*2009,52:256–69].
10. Wandabwa J, Doyle P, Todd J, Kiondo P, Wandabwa MA, Aziga F:Riskfactors for ruptured uterus in Mulago hospital Kampala. *East Afr Med J*,85:56–63].
11. Federal Democratic Republic of Ethiopia Ministry of Health. BasicEmergency Obstetric and Newborn Care (BEmONC). 2010]
12. Engida Y., etal, Knowledge and utilization of partograph among obstetric care givers in public health institutions of Addis Ababa, Ethiopia. *BMC Pregnancy and Childbirth* 2013, 13:17.].

13. WHO: The partograph an essential tool to make decision during labor, maternal and neonatal health. best practice; 2002
14. Lavender T., Omoni, G., Lee, K., Wakasiaka, S., Watiti, J., Mathai, M. Students' experiences of using the partograph in Kenyan labour wards. African Journal of Midwifery and Women's Health 2011, 5 (3): 117-122]
15. Carlson-Babila Sama, Noah F. Takah, Valery K. Danwe Knowledge and utilization of the partograph among obstetric care-providers in urban referral public health institutions in north west and south west Cameroon PLOS ONE | DOI:10.1371/ journal. Pone. 0172860 February 24, 2017
16. Agboola, A. Textbook of Obstetrics and Gynecology for medical student. 2nd Ed. Heinemann Education Books, Nig PLC; 2006
17. Negash Wakgari, et al Knowledge of partograph and its associated factors among obstetric care providers in North Shoa Zone, Central Ethiopia: a cross sectional study, BMC Res Notes (2015) 8:407
18. Desalegne Amare Zelellw et al, Knowledge and Attitude of Obstetric Care Providers on Partograph and Its Associated Factors in East Gojjam Zone, Northwest Ethiopia Hindawi Publishing Corporation Advances in Medicine Volume 2016, Article ID 6913165, 8 pages
19. Thomas U. Agan et al Knowledge and Utilization of the Partograph among Non-physician Obstetric Care Givers in the University of Calabar Teaching Hospital, Calabar, Nigeria British Journal of Medicine & Medical Research 4(36): 5741-5755, 2014

ANNEX

Annex I. Questionnaires

Knowledge and Utilization of the Partograph among Midwives

Code ... Date Name of institution

1. Age (years).....
2. Sex: 1. Male 2. Female
3. Religion: 1. Christian 2. Muslim 3. Others
4. Marital status: 1. Married 2. Single 3. Divorced
5. Professional qualification: Midwife 1. BSc..... 2. Diploma..... 3. Level.....
6. Years of experience:
7. Have you seen a partograph before? 1. Yes 2. No
8. Have you ever used a partograph before? 1. Yes 2. No
9. Is the partograph available in your labour ward now?
 1. Yes ... 2. No 3. I do not know ...
10. Indicate how often you use the partograph for women in your labour ward:
 1. Never 2. Rarely 3. Sometimes 4. Often 5. Always
11. What is your reason (s) for not routinely using the partograph:
 1. Time-consuming (much details to fill)..... 2. Shortage of staff 3. Non-availability of partograph 4. Little or no knowledge on how to fill it 4. It's easier to manage labour without use of the partograph 5. Work load.....
12. Did you receive any training on the use of partograph? 1. Yes 2. No

13. The partograph may be defined as.

	Yes	No	Don't know
A chart developed by midwives in developing countries to monitor labour			
A complex tool with pictorial overview of labour for use by midwives			
A chart for monitoring labour by doctors			
A simple graphic recording of labour and salient conditions of the mother and foetus against time in hours			

14. Indicate your agreement with the following

Using the partograph	Yes	No	Don't Know
Will reduce maternal mortality			
Will reduce maternal morbidity			
Will reduce neonatal mortality			
Will reduce neonatal morbidity			
Will increase the efficiency of those attending to women in labour			
Is mandatory for improved quality of care of a woman in labour			

15. In a normal progress of labour;

	Yes	No	Don't know
The graph/plot on the partograph should fall to the left of the alert line			
The graph/plot on the partograph should fall on the alert line			
The graph/plot on the partograph should fall to the right of the alert line			

16. The followings are functions of the action line on the Partograph

	Yes	No	Don't know
Indicates appropriate action must be taken			
Allows time for the woman to be adequately assessed for appropriate intervention			
Continuous observation and monitoring till delivery			

17. During labour:

	Yes	No	Don't Know
Three contractions in every 10 minutes is normal			
Minimum duration of a strong contraction is 40 seconds			
You require 10 minutes to effectively assess adequacy of contractions			
Progress of labour is assessed by the degree of cervical dilatation and descent of the presenting part			
Labour is prolonged when it lasts more than 12 hours			

18. Which of the following diagnosis can you make with the partograph?

	Yes	No	Don't Know
Prolonged labour			
Obstructed labour			
Poor progress of labour			
Inefficient uterine action			
Suspected fetal distress			
Abnormal fetal heart rate			
Satisfactory progress of labour			
Need for augmentation of labour with oxytocin			
Need for caesarean section			
Dehydration in the mother			

Annex II:- Criteria for the partograph knowledge score

Knowledge score assessment		Score	
		Yes	No
1	Correct definition of a partograph	4	0
2	Benefits of use of Partograph		
	a) Reduce maternal mortality	1	0
	b) Reduce maternal morbidity	1	0
	c) Reduce neonatal mortality	1	0
	d) Reduce neonatal morbidity	1	0
	e) Increase efficiency in labour	1	0
	f) Mandatory for improved quality care	1	0
3	Diagnosis can be made using partograph		
	a) Inefficient uterine action	1	0
	b) Suspected foetal distress	1	0
	c) Abnormal foetal heart rate	1	0
4	Function of action line	3	0
5	Correct assessment of normal progress of labour	3	0
6	Components of labour assessment		
	a) Number of contractions	1	0
	b) Duration of contraction	1	0
	c) Duration of labour	1	0
	d) Time required to assess adequacy of contractions	1	0
	e) Progress of labour	1	0
Total		24	0/24