THE COMPLETION RATE OF MODIFIED WORLD HEALTH ORGANIZATION-PARTOGRAPH AND ITS ASSOCIATION WITH MATERNAL AND PERINATAL OUTCOMES IN JIMMA SPECIALIZED HOSPITAL, OROMIA, ETHIOPIA.

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Jimma, Ethiopia.

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Abstract.

***Introduction* :-** *The management of labor using partograph is the standard way of improving both maternal and perinatal outcome. It increases the quality and regularity of all observations on fetus and the mother during labor and aids in timely recognition of problems in both mother and fetus. [1-3]*

Objectives*:-The objective of this study was to assess the completion rate of partograph recordings and its association with maternal and perinatal outcomes among women delivering in Jimma University Specialized Hospital (JUSH).*

Method:--*A facility-based prospective descriptive cross-sectional study was conducted in JUSH from June- 01/2014 –August-30 /2014. In this study all women who were delivered in JUSH were included and labor was monitored using modified WHO-partograph. Recordings of parameters of labor in partograph, fetal outcomes (APGAR-score, NICU-admissions, still birth) and immediate maternal outcomes (PPH, Tear, visceral injury….) were assessed using check lists .The data were collected through face to face interview and observations of the partograph recordings and analyzed by SPSS-window -20. Bivariate and Multivariate Logistic regression was used. Variables having P<0.25 from bivariate analysis was included in multivariable logistic regression analysis. Finally, statistical significance was declared at P<0.05.*

Result*:-Total of 318 partographs were reviewed using prepared checklist. Of the total partograph reviewed only 20.4% of partograph had all parameters with standard recording. The most unrecorded parameters were fetal skull molding-76.1% and most recorded uterine contraction and cervical dilatation 93.7%.*

Substandard Fetal heart rate, Recording of liquor status and Measurement of maternal body temperature-monitoring have a significant association with adverse fetal (still birth, NICU-admission, Low APGAR-score at 5th-minute and Early neonatal death) perinatal and adverse maternal (Postpartum hemorrhage, Sepsis, Chorioamnionitis. Tear, Death...) Outcomes.

Conclusion and Recommendation: - This study found high proportion of substandard partogram recordings. Substandard recordings of fetal heart rate, maternal body temperature, and liquor status were significantly associated with adverse fetal and maternal outcomes. Wide scale study should be undertaken using this as base line .Supervisory mechanisms and on job training on partograph use are important to improve labor monitoring and standard recordings.

Acknowledgment

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Acronyms

APH- Ante partum hemorrhage.

ANC - Antenatal care

APGAR-Appearance-Pulse-Grimace-Activity-Respiration

AVD – Assisted vaginal deliveries

CPD - Cesphalopelvic disproportion

C/S - Caesarean section

DD - Destructive Delivery

FHR - Fetal heart rate

IUFD - Intrauterine fetal death

MDG- Millennium development goal

ENND-Early neonatal death

JUSH - Jimma University Specialized hospital.

MMR - Maternal mortality rate

NICU- Neonatal intensive care unit

NMR – Neonatal mortality ratio

ObGy –Obstetrics and Gynecology

OL – Obstructed labor.

PR- Pulse rate

PPH - Postpartum hemorrhage

PNA- Perinatal asphyxia

SVD- Spontaneous vaginal delivery

WHO -World health organization.

CHAPTER-ONE:-Introduction

1.1. Background:-The partograph is a pre-printed paper with a visual/graphical representation of observations made on a woman and fetus during the course of labor. The observations are comprised of the progress of labor, maternal vital signs and fetal heart condition. These observations are displayed on the partograph for easy and quick review of on-going labor progress and timing of management decisions. The partograph is used as a tool for risk assessment and is effective in detecting abnormal labor during the active first stage of labor. When used correctly, the partograph helps to identify problems and interventions can be timely initiated thereby preventing morbidity and mortality. The graph is plotted from the time when the woman is in active phase of labor [3 ,4] .The partograph use dates back to the 1950s. It was developed by Friedman, an obstetrician, who had used it to monitor cervical dilation and called it the cervicograph. In 1972; Philpot further developed the cervicograph into the partograph which became a practical tool for recording all intrapartum observations in addition to cervical dilation. In Philpot's partograph, he designed alert and action lines which helped to capture prolonged labor. In 1988, Safe Motherhood Initiative launched the use of partograph as an international standard practical tool to monitor labor and prevent prolonged labor. In 1994, WHO extensively tested its efficacy and established its scientific basis and rationale for its use in prevention of prolonged labor. Its use reduces the incidence of prolonged/ obstructed labor and can also detect fetal heart abnormalities which can result in intrapartum fetal hypoxia.[4]. In 1994 WHO declared universal application of the partograph in all settings. The partograph provides a framework for assessing maternal and fetal condition and labor Progress during labor.[3, 5, 6]

1.2. Statement of the problem:- The partograph is the graphic representations of labor and an excellent visual resource to analyze cervix, uterine contraction and fetal conditions in order to achieve good maternal and perinatal outcome [7].Studies done at different areas showed promising result in reducing maternal and fetal complications. Complicated deliveries are more detrimental as they cause severe psychological and physical harm to women, serious economic and social changes as well as adverse maternal and fetal outcome. Managing complications is expensive [7]. Ethiopia is currently reported to have MMR-of 350/100,000 against MDG-target of 267/100,000 live births and neonatal mortality rate 46 /1000 live births [9]. In Jimma University Specialized hospital a retrospective one year study done by Gyn/Obs-Final year resident (September 11, 2011 to September 10, 2012) showed -MMR- 1487/100,000 and PNMR-98.2/1000 live births which were more by far less than MDG- target [8]. Hemorrhage and Obstructed labor – are the commonest cause of maternal death and birth asphyxia for fetal death which was preventable [3, 7] .The partograph is an effective tool to recognize such problems during labor. It helps in early decision making and intervention that can decrease maternal and fetal morbidity and mortality . This study attempts to explore these problems-like high maternal and perinatal mortality and morbidity with the use of modified WHO- partograph in JUSH labor ward and to see the link between quality of partograph recordings and perinatal outcomes. [8 &9]

CHAPTER TWO: Literature Review.

The partograph is a vital tool for providers who need to be able to identify complications in childbirth in a timely manner and refer or decided interventions for management. Skilled management of labor using partograph, a simple use of chart for recording information about the progress of labor and the condition of women and her baby during labor is the key to the appropriate prevention and treatment of prolonged labor and its complications.[10, 11] .Proper use of partograph to monitor labor has been associated with good fetal outcomes.[12] A study conducted on 207 files in 2007 in Kenya on use of partograph and labor outcomes showed the rate of augmentation remained similar in both groups at 22% (exposed) and 19% (unexposed). However when the tracing crossed the action line in the exposed group, intervention by caesarean section went up threefold, from 8.1% to 25%· . Duration of labor at the hospital was comparable with a mean of 6.land 6.8 hours among exposed and unexposed women respectively. Prolonged labor (>18hrs) was twice more likely to occur in unexposed (3.7%) than exposed (1.3%) but this was not statistically significant. Modes of delivery in both groups were comparable with the rate of caesarian at 14.4% and 11.4% among the exposed and unexposed respectively. Use of oxytocics in 3rd stage stood at 63.5% and 45.5% among exposed and unexposed respectively. According to this study Outcomes of labor were favorable for the majority of the women and their infants with no significant differences between the two groups. [1, 3] .Another study showed The emergency caesarean section rate was reduced from 44% in controls to 21% in cases.[13]. And primary post-partum hemorrhage (1%).[13]

Another retrospective comparative study done 923 breech presentations prior to implementation of the partograph and 817 after. The overall Cesarean section rate was 29.7% (21.6% emergency and 7.6% elective) [14].Introducing the partograph reduced Cesarean sections for multigravida from 27.1% to 19.3% (non-significant) but had no impact on the rate for primigravida (38.5% to 38.7%). Prolonged labor (> 18 hours) was reduced significantly among multigravida and primigravida despite a reduced use of oxytocin. Intrapartum stillbirths fell (non-significantly) from 1.9% to 1.1% (all parities combined). Fetal outcome, as measured by intrapartum death and Apgar scores < 7 at 1 minute, was significantly better when delivery was by Cesarean section rather than

vaginally, regardless of use of the partograph. According to this study the use of the WHO partograph in the management of breech labor reduces prolonged labor and (among multigravida) Cesarean sections and improves fetal outcome. In this study, however, Cesarean section was a safer method of delivery for the baby, regardless of use of the partograph.[14, 15]

There was a promising fetal outcomes in labor followed using modified WHO-partograph. Intrapartum stillbirths fell (non-significantly) from 1.9% to 1.1% (all parities combined). Fetal outcome, as measured by intrapartum death and Apgar scores < 7 at 1 minute, was significantly better when delivery was by Cesarean section rather than vaginally, regardless of use of the partograph. There was also clear relationship between fetal outcomes and use of partograph. Studies done in Rajiv Gandhi in-2012 showing the relation between APGAR-score at first-minute and partograph patterns are highly significant. Another study done in Uganda to assess partograph use during labor, found that good Apgar score was statistically significant associated with standard fetal monitoring [16, 17]

Substandard recordings of parameters of labor in a partograph have been observed in some studies. The study conducted in Muhimbili National hospital , Tanzania on quality of partograph recordings and perinatal outcomes for a total of 2,372 deliveries from September – November -2011 showed majority of partograph recordings in this study - 91.9% of them were not documented per-protocol(substandard) . This gives an impression that either labor monitoring in the hospital is poor or there is inadequate recording of labor parameters in the partograph. Substandard fetal heart rate monitoring, uterine contractions and me conium stained liquor are significantly associated with Apgar score less than 7 at 5 minute and stillbirth. This means that association between quality of partograph recordings and perinatal outcomes does exist. There is no association between quality of partograph recordings and immediate maternal outcomes.[2]

Study conducted In Zambia on partograph recording and outcomes showing about 50% of the women had low monitoring of the maternal condition during labor and 30.4% of them had moderate monitoring while only 23.7% had consistent monitoring. Further, 10.9% of the women with low monitoring of maternal conditions had poor outcome of labor, while 6.0% of them with moderate monitoring also had poor outcome. [18] A

retrospective study conducted in a tertiary teaching hospital in Ghana to assess the adequacy of partograph use by skilled birth attendants and the timeliness and type of action taken if action line was crossed was assessed and partographs were adequately completed in accordance with WHO guidelines only 25.6% (472) of the time.[10]

A cross sectional study on use and documentation of partograph and factors that prevent optimal utilization of the partograph in Melawi reveals high proportions of incompletely recorded parameters on the partographs. Maternal blood pressure and pulse rate were completed in 3%, and 2% of the charts respectively; temperature was 1. Fetal heart rate and liquor were completed in 3% and 3% respectively; and molding was 2% while labor progress was 4%. There was no parameter that was well documented more than the other. High percentages of incomplete documented parameters on the partograph reflect lack of continuity in plotting. Lack of documentation on the partograph indicates poor monitoring of the women who reported in labor at the two units. Monitoring and documentation was grossly inadequate and therefore incapable of detecting problems. This shows problems might have been missed, and affected the outcomes of the mother and fetus. Regular observations are required to be able to detect problems.[3]

The Study done in Bahar Dari University on utilizations of partograph among health professionals tried to assess utilization of the partograph in the sampled health facilities. The result revealed 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 filled to assess the progress of labor. The remaining partograph papers had never been filled and hence excluded them from the assessment. Among those filled (58) partograph charts, only seventeen (29.3%) of them were properly filled. Whereas, the majority 41 (70.7%) of them were partially filled. The observation showed that plotting of fetal heart beat (FHB), initial cervical dilatation, 4 hourly cervical dilatation, descent of the fetus, uterine contraction, nature of the membrane, monitoring of maternal B/P, plotting of the graph across the alert or action line etc. was made for 79.3, 87.9, 60.3, 41.4, 60.3, 63.8, 36.2, and 39.3 percent respectively of the charts reviewed during the study. Although majority of the components of the partograph, were plotted correctly. A significant number of the charts did not contain complete information about important events such as early referral or presence of expedited delivery. That is why some data indicated under not applicable or not recorded sections were not clear.[7].

2.2:-Significance of the study

The partograph is the graphic representations of labor and an excellent visual resource to analyze cervix, uterine contraction and fetal conditions in order to achieve good maternal and perinatal outcome. Studies done at different areas showed promising result in reducing maternal and fetal complications. Complicated deliveries are more detrimental as they cause severe psychological and physical harm to women, serious economic and social changes as well as adverse maternal and fetal outcome. Managing complications is expensive.[19] Ethiopia is currently reported to have MMR-of 350/100,000 against MDG-target of 267/100,000. And neonatal mortality rate 46/1000 live births {9}. In Jimma University Specialized Hospital a retrospective one year study done by Gyn/Obs-Final year resident in 2013 showed -MMR- of 1487/100,000 and PNMR-98.2/1000 live births which more by far less than MDG-target. Hemorrhage and Obstructed labor – are the commonest cause maternal death and birth asphyxia for fetal death which were preventable. The partograph is an effective tool to recognize such problems during labor. It helps in early decision making and intervention that can decrease maternal and fetal morbidity and mortality . This study attempts to explore these problems with the use of modified WHO- partograph in JUSH labor ward and to see the link between the completion of partograph recordings and perinatal outcomes. The results will also inform on areas where teaching strategies need to be enhanced as it relates to instruction on partograph, its purpose and correct use at a referral hospital. Ultimately the healthcare workforce may be more equipped to effectively monitor the health of mother and babies. [20]

CHAPTER THREE: Objective

2.1 General objective.

To determine the completion rate of modified WHO-partograph and association with maternal and perinatal morbidity and mortality among women delivering in Jimma University Specialized hospital.

2.2. *Specific objectives.*

- To assess partograph record completion rate among labor and deliveries attended in JUSH
- To assess the outcomes of labor followed using Modified WHO-partograph.
- To assess relationship between partograph completion and perinatal outcome.
- To determine the relationship between partograph completion and maternal outcome

CHAPTER FOUR

Methods and Materials

4.1. Study area and period**.** The study was conducted in Jimma University Specialized Hospital (JUSH) which is located 357kms Southwest of Addis Ababa located in Jimma town, Oromia regional state. It is one of the oldest teaching hospitals in the country giving services to people living in Jimma zone and serving as a referral hospital in the South-West Ethiopia with a catchment population of about 15million people. It also serves as a teaching center for clinical undergraduate studies like medicine, Health officer, Dentistry, Anesthesia, Nursing, Lab-technologist, Midwifery and others and post graduate clinical specialty teaching hospital for Obstetrics and Gynecology, Internal Medicine, Pediatrics & Child Health since 2005 and for Ophthalmology, and in Surgery since 2007 and Radiology and pathology since 2011/2012. Department of Obstetrics and Gynecology has two inpatient (Gynecology and obstetrics). It has seven consultant Obstetricians & Gynecologists and 40- residents from year I – III. The labor ward has 6 beds in first stage, 4 delivery couches and maternity wards had 40beds in maternity ward, one emergency OR-table room and one recovery-room with two beds and two resuscitation tables for newborns. The study was conducted for a total of 03months from June-01/2014-August -30/2014.

4.2- Study design:-A prospective descriptive cross-sectional document review study was used to determine the implementation of the partograph and outcomes of labor at JUSH.

4.3- Source population:-All labor and deliveries followed in Labor suite using modified WHO-partograph of Jimma University Specialized during the study period of June-01/2014-August -30/2014.

4.4. Study population:-All labor and deliveries (n=1030) conducted in Labor suite using modified WHO-partograph in Jimma University Specialized.

4.5. Sample size and Sampling technique:- The sample size was determined using a single proportion formula $n = Z2(\alpha/2)^2 p(1-p) / w^2$ where n is the required sample size, z is the standard normal deviate, set at 1.96 (for 95% confidence level), w is

the desired degree of accuracy(taken as 0.05) and p is the estimate of the proportion of the modified WHO partographs on which all components of the sample size required for this study was estimated to be 318 partographs. The partograph are recorded up to the standard (assumed to be 29.3% as obtained from a retrospective study done in Ethiopia Addis Abeba in 2012 on the use of partographs in public health facilities of Addis Abeba to assess the compilation rate of modified WHO-partograph [7].

4.6. Inclusion and exclusion criteria.

A. Inclusion criteria

Partographs for all women admitted with diagnosis of labor

Women who were admitted in labor with active first stage of labor but not advanced

Partograph for all methods of delivery

B. Exclusion criteria

- Admitted with cervical dilatation ≥8 cm (Advanced labor)

Those with obstetric complications:-

- Ante partum hemorrhage
- Multiple pregnancies
- Premature labor (Labor before 37 completed weeks)
- Preeclampsia/eclampsia.
- Previous uterine scar and IUFD.

4.7. Study Variables.

4.7.1. Independent variables

1. Fetal parameters.

- FHR
- Status of membrane.
- Liquor status.
- Molding and caput.

2. Monitoring of progress of labor.

-Cervical dilatation.

- Uterine contraction

- Descent

-Alert and action lines.

3. Maternal parameters.

- Gravidity and parity.

- Maternal vital signs.

- Urine output

4.7.2. Dependent variables

Maternal Outcomes

1. Caesarean section
2. Oxytocin augmentation
3. Serious maternal morbidity or death (e.g. admission to ICU, septicemia, and organ failure)
4. Instrumental vaginal delivery
5. Postpartum hemorrhage.
6. Blood transfusions
7. Antibiotic use
8. Episiotomy
9. Third and fourth degree perineal tears

2. **Fetal Outcomes.**

1. Low Apgar score (less than seven at fifth minutes).
2. Fetal gender and birth weight
3. Admission to special care nursery (NICU)
4. Need for resuscitation at delivery
5. Neonatal sepsis at neonatology
6. Intrapartum fetal death
7. Condition at discharge (normal, improved, died).

4.8:-Data collection instruments (Quantitative variables).

The instrument was developed by reviewing different literatures. Checklists were used for the data collection. The checklists were formally prepared in English. The checklist grouped into 4 sections and used for extracting information from the pantograph. The first part recorded information about patient's age, gravidity, parity, estimated gestation age (by dates) and estimated time between onset of labor and hospital admission. Second part recorded the parameters of labor which were fetal heart rate, liquor state, molding/caput, cervical dilatation, descent of head, uterine contraction, maternal BP, maternal temperature, maternal pulse rate and maternal urine analysis. Each parameter was assessed as not recorded, standard or substandard recorded according to protocol of standard care (Operational definition). The third part recorded the fetal outcomes. Fetal outcomes were assessed in terms of live birth (Apgar score 7 or more and Apgar score less than 7 at 5 minutes), still birth, need of resuscitation, admission to neonatal ward for special care and the reasons of admission.

The fourth part included information of the mode of delivery and immediate maternal outcomes. Mode of delivery was assessed as spontaneous vaginal delivery, assisted vaginal delivery (when ventous used) cesarean section and hysterectomy. Immediate maternal outcome were recorded as good and adverse if the woman got PPH, perineal tear (second degree and above), need of blood transfusion, urinary bladder injury, hysterectomy or bowel injury.

4.9:- Data collection procedures and personnel

The Obstetrics& Gynecology residents' two medical interns and midwives' were trained on data collection procedures. Data were collected from partograph of the client on discharge from maternity ward and neonatal chart reviewed for those admitted to NICU. Mothers and neonates were followed until they were discharged from the hospital. After the data was collected, it was revised by the principal investigator for completeness.

4.10:-Data processing and analysis

The collected data was cleaned, fed to computer and Statistical Package for Social Sciences (SPSS for windows version 20) was used for data analysis. Descriptive statistics was used to describe the main features of the data. Bivariate analysis was done to

determine association between independent variables and outcome variable. Multivariate Logistic regression was used to control the effect of confounding variables. Variables having P<0.25 from bivariate analysis was included in multivariable logistic regression analysis. Finally, statistical significance was declared at P<0.05. Results was presented by using tables and statistically tested. Final interpretation, discussion and recommendation were made based on the findings of this research.

4.11:- Ethical considerations

The ethical clearance was secured from the College health sciences of JU. Verbal informed consent was obtained from every study subject before the interview by explaining the objective of the research. All the information collected from the study subjects was handled confidentially through omitting their personal identification, conducting the interview in private place and the data was used for the research purpose only to assess relationship between partograph completion and perinatal outcome.

4.12:- Operational definition and definition of terms.

Maternal Mortality Ratio (MMR): is the ratio of the number of maternal deaths per 100,000 live births during the specific period.

Perinatal mortality: Is the death of a viable fetus and neonate.

Live birth: The newborn shows signs of life after the delivery.

Fetal death (stillbirth): Death of the fetus occurs prior to expulsion or extraction from the mother

Perinatal mortality rate (PMR): Is the number of death of fetus or neonates per 1,000 live births.

Labor: is a physiologic process during which the products of conception (i.e. the fetus, membranes, umbilical cord, and placenta) are expelled outside of the uterus.

Normal labor: Is when a woman with term pregnancy (37-42 weeks) is admitted in labor requiring no induction or oxytocic stimulation, no instrumental or abdominal delivery but attains spontaneous vaginal delivery.

Obstructed labor: Labor is obstructed when there is absence of progress in cervical dilatation, or, failure of presenting part to descent in the pelvis despite good, efficient and regular uterine contractions.

Asphyxia:-a conditions in which viable newborn fails to attain or initiate respirations after delivery.

APGAR-score: - a method of assessing fetal conditions at time of delivery.

Favorable/Good outcome:-Mother and Neonate with no any complications.

Unfavorable/Adverse outcome:-Mother and Neonate developed complications.

Complete partograph:-If the partograph had information all sections of the partograph (100%).

Incomplete partograph:-If there was no full information in the component of partograph of the labor chart (<87.5%).

Precipitated labor:- extremely rapid labor and delivery(<3hours)

Protraction of cervical dilatation:- slower-than-normal progress of labor(cervical dilation for primigravid <1.2cm/hr, Multigravid <1.5cm/h)

Arrest of cervical dilatation:- complete cessation of progress of labor for both primigravid and multigravid lady.

Molding:-Overlapping or approach of each other of fetal skull bone

PNA:-Newborn with 5^{th} –minute APGAR-score of <3.

Protocols of standard cares:-

1. Fetal Heart Rate - monitored every 30minutes.
2. Descent/Molding " " 4hours
3. Cervical status " " 4hours
4. Uterine contraction " " 30minutes
5. Maternal Blood pressure " 2hours
6. " Pulse rate " " 30minutes
7. " Temperature " " 2hours

- A. No Record
- B. Substandard→at least one missed
- C. Standard → all parameters are recorded

4.13:- Plan of dissemination of the result

The result will be submitted to department of obstetrics and gynecology, Jimma University post graduate studies, JUSH and presented on scientific presentation

auditorium. Further effort is made for publication on local and international peer reviewed journals.

4.14:- Limitations of the study

- ✓ Problem of follow-up for neonate after discharge and in neonatology.
- ✓ Lost Partograph paper from chart
- ✓ Inconcisentant use of partograph
- ✓ The study was not a case control study, so it was difficult to determine whether complications occurred due to pre-existing conditions.

CHAPTER FIVE: Results

5.1 Demographic characteristics of respondents.

There were a total of 1030 Mothers, who gave birth in the hospital during the study period from which majority of them followed using partograph. After reviewing the patient chart of those who delivered in the hospital after being followed by modified WHO- partographs and who those met the inclusion criteria 318-partographs were reviewed using a checklist.

5.2. Socio-demographic characteristics of the mothers

Majority of the mothers (67.9%) were age between 20-29years and mean age was 24.85 ±5.10 (SD) years. Almost 2/3rd of mothers come from outside jimma town (62.6%). Half of the mothers were para- I (49.4%) whereas 39.9% and 10.7% of the mothers were Para II to IV and Para V and above respectively. Around two third of mothers were admitted during day time (63.2%) and majority of them presented with in 12 hours of labor onset(54.4%) and the average time of admission was 12hours and Times of admission ranges between 2-66hours.The predominant religion of the mothers was Muslim accounting for about 67.9% of the cases. More than three fourth (82.4%) of the mothers were Oromo and 49.1% of the mothers cannot read and write. Most (80.5%) of the mothers were housewives. Among the mothers included in the study, 99.4% were married. (Table-1 below)

Table- 1: socio-demographic characteristics of the mothers involved in the study JUSH- June-01/2014-August -30/2014.

Variable(n=318)		**Frequency**	**Percent**
Age of mother in years :	15-19	38	11.9
	20-24	113	33.5
	25-29	103	32.4
	30-34	36	11.3
	≥35	28	8.8
Address	in Jimma town	119	37.4
	Outside Jimma town	199	62.6
Parity	para-1	161	50.6
	Para 2-4	124	39
	≥5	33	10.4
Time interval	Less than 12hours	173	54.4
	12-24hours	125	39.3
	More than 24huors	20	6.3
Ethnicity	Oromo	262	82.4
	Amhara	44	13.8
	Dawuro	7	2.2
	Others*	5	1.5
Religion	Orthodox	78	24.5
	Muslim	216	67.9
	Protestant	24	7.5
Educational status:-	Can't read-write	156	49.1
	Read-write	75	23.6
	Grade 1-8	41	12.9
	Grade 9-12	27	8.5
	Grade >12	19	6
Marital status	Married	316	99.4
	Single	1	0.3
	Divorced	1	0.3
Occupation	Housewife	256	80.5
	-Employee	33	10.4
	-Farmer	13	4.1
	-Merchant	15	4.7
	-Others**	1	0.3
Total		318	100

* Tigrie, Guragie, Siltie, Yam ** Student, daily laborer

5.3:- Completeness of documentation on the Partographs.

The components on the partograph were assessed on the degree of completeness in filling. Each component was assessed if each parameter had information documented. The findings showed that not all components had parameters filled in. In some cases, one parameter of the component was filled in. For example, on monitoring fetal condition, FHR was the common parameter filled in (92.5%). On monitoring maternal condition, it was blood pressure which had more (90.9%) observations than pulse rate and temperature. Labor progress monitoring-uterine contraction well monitored. (93.7%) The table below represents the number of partographs which had parameters correctly filled in standard, substandard and others not recorded at all. For those mothers with complete partograph (standard) 89% of them had good fetal outcomes but 87.4% of substandard also had good outcomes. Regarding maternal outcomes with partograph completeness there was no differences between the two groups (89.8% vs. 90.4%)

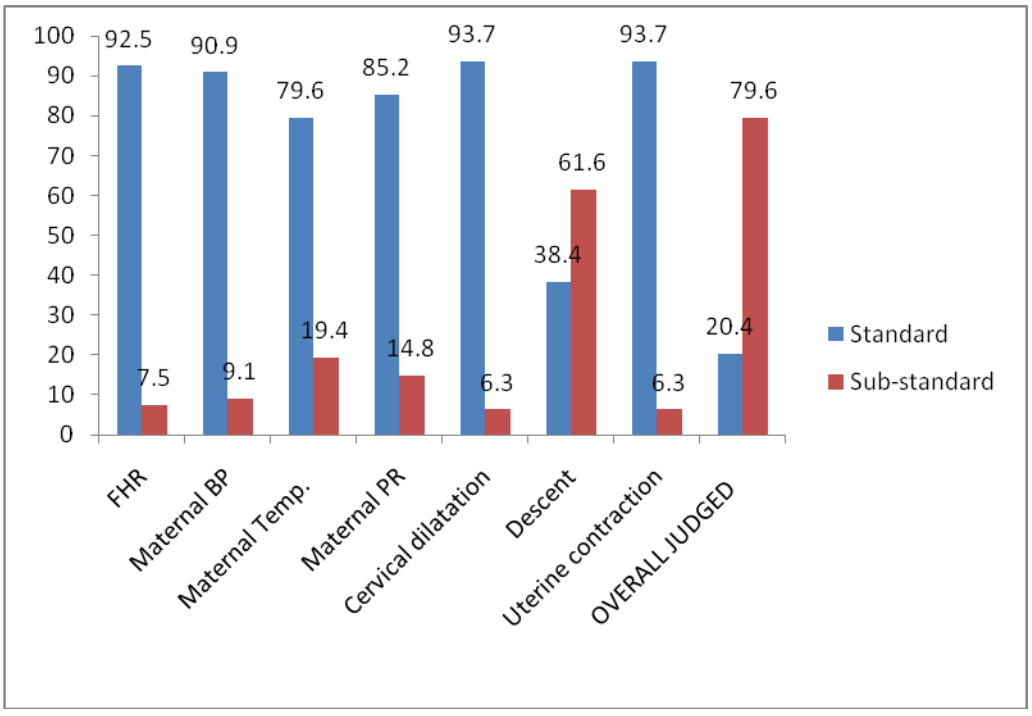

Fig1: Proportions of Completeness of documentation of partographs parameters - June-01/2014-August -30/2014 JUSH.

Table-2:- Proportions of Completeness of documentation of partographs parameters USH- - June-01/2014-August -30/2014.

Variable(n=318)		***Frequency***	***Percent***
Membranes status	Not recorded	53	16.7
	Intact	156	49.1
	Ruptured	109	34.3
Liquor status	Not recorded	111	34.9
	Clear	88	27.7
	Meconium stained	15	4.7
Molding	Recorded	76	23.9
	Not recorded	242	76.1
OVERALL GUDGED:-	Not Recorded	406	42.6

Table – shows the parameters of partograph completeness. The study revealed that the most properly filled and least filled parameters. Accordingly, FHR (92.5%) maternal blood pressure (90.9%) and cervical dilatation (93.7%) were the most monitored indicators. But, descent was assessed only in 38.4% of the labor. Overall 20.4% of parameters were properly filled while 79.6% of parameters were not properly recorded. Of all the parameters of the partograph molding status only recorded in 76(23.9%) this is the least of all parameters.

5.4:-Mode of deliveries of the study group:-

Almost 3/4th – of mothers followed using partograph delivered by spontaneous vaginal delivery (76.7%) and 7.9% were by assisted vaginal deliveries for which all were assisted by forceps and 15.4% delivered by caesarean section delivery for different reason. *(.Table-3)*

Table-3:-Mode of Delivery JUSH- June-01/2014 - August -30/2014.

Mode of Delivery		Frequency	Percent
SVD		244	76.7
AVD	Forceps	25	7.9
	Vacuum	0	0
	Destructive deliver	0	0
Caesarean delivery		49	15.4
Caesarean hysterectomy		0	0

5.5:-Perinatal outcomes of study group

This study found that from the total deliveries followed (318) 99.1% of them alive on delivery and of these their first minute APGAR-score less than or equal to three (≤3) was 3.5% while 4 – 6 and seven and above were 27.4% and 69.2%. The 5^{th}-minute APGAR-score for majority of newborn (89.9%) more than six and only 2.2% of newborn have severe asphyxia (≤3).Fetal weight for more than three-fourth of the newborn within normal birth weight (88.7%) while 5.7% of them are macrocosmic (>4000gm).Average fetal weight was 3250±494.6gm(SD) and minimum weight in study was-1400gm and maximum 5000gm. Fetal sex distributions show female-44.7% and male -55.3%.Majority (82.1%) of neonate did not need resuscitation after delivery. About 16.7% of neonate referred to the NICU for which low APGAR-score is the major reason for referral (41.8%) and admitted there with admission diagnosis of PNA and Meningitis (18.2% each) and EONS and Me conium aspiration syndrome –diagnosed in 14.5% and 16.4% respectively of cases. O f the total newborns 76.4% discharged normal , 30% of them unknown on discharge and 6% of cases are died(include still birth and Early neonatal death) for which the cause of death unknown in more than two-third the cause (73.7%).(Table-4)

Table-4:-Fetal outcomes JUSH- June-01/2014 - August -30/2014

Variables(n=318)		Frequency	Percent
Condition	**Alive**	**315**	**99.1**
	Still birth	**3**	**0.9**
Fetal weight	**<1500gm**	**1**	**0.3**
	1500-2500gm	**17**	**5.3**
	2500- 4000gm	**282**	**88.7**
	>4000gm	**18**	**5.7**
Sex	**Female**	**142**	**44.7**
	Male	**176**	**55.3**
APGAR-score at 1st minute	**- 0 -3**	**11**	**3.5**
	- 4-6	**87**	**27.4**
	≥7	**220**	**69.2**
APGAR-score at 5th minute	**0 -3**	**7**	**2.2**
	4-6	**25**	**7.9**
	≥7	**286**	**89.9**
Resuscitation done	**Yes**	**57**	**17.9**
	No	**261**	**82.1**
Admitted to NICU	**Yes**	**53**	**16.7**
	No	**265**	**83.3**
Reason of admission	**Low APGAR**	**23**	**41.8**
	Premature	**1**	**1.8**
	LBW	**4**	**7.3**
	Others*	**27**	**49.1**
Diagnosis at NICU	**PNA**	**10**	**18.2**
	EONS	**8**	**14.5**
	Meningitis	**10**	**18.2**
	MAS	**9**	**16.4**
	Others**	**18**	**32.7**
Condition at Discharge-	**Died**	**19**	**6**
	Improved	**26**	**8.2**
	Normal	**243**	**76.4**
	Unknown	**30**	**9.4**
Cause of Death	**Known**	**5**	**26.3**
	Unknown	**14**	**73.7**

***Macrosomia, maintenance fluid of critical mother ** HMD, hypoglycemia, hypothermia**

5.6:- Maternal Outcomes of the study group

Regarding maternal outcomes majority the mother (89.9%) have no adverse outcome and only 10.1% of have adverse outcomes from which uterine atony contributed to be 25.7% and laceration- 17.1% and other complications(Anemia- Sepsis-Chorioamnionitis-retained placenta…).(Table-5)

Table-5:-Maternal Outcomes JUSH- June-01/2014 - August -30/2014

Variable		**Frequency**	**Percent**
Maternal Outcomes	**No adverse outcome**	**286**	**89.9**
	Adverse outcome	**32**	**10.1**
Adverse outcomes	**Uterine atony**	**9**	**25.7**
	Genital laceration	**6**	**17.1**
	Others*	**20**	**57.1**

*** Chorioamnionitis, Puerperal sepsis, transfusion, ICU admission…**

5.7:- Labor Abnormalities and Action taken for group

From this study we found that there was no abnormality of labor identified in more than three-fourth (89.9%) of mothers followed by partograph and those of identified abnormalities arrest disorder is two-third of the problems (65.6%) and precipitated labor is the least identified abnormalities (12.5%). For majority of laboring mother (78.6%) no action taken. (Table-6)

Table-6- Labor Abnormalities and Action taken JUSH- June-01/2014 - August – 30/2014

Variable		Frequency	Percent
Labor abnormality:	**-Yes**	**32**	**10.1**
	-No	**286**	**89.9**
Abnormalities encountered	**Precipitated labor**	**4**	**12.5**
	Protracted	**7**	**21.9**
	Arrest	**21**	**65.6**
Action taken:-	**None**	**250**	**78.6**
	Augmentation	**23**	**7.2**
	Operative delivery	**45**	**14.2**

5.8:- Association between quality of partograph recordings and prenatal outcomes.

From the study we saw that the substandard FHR-monitoring has a statistical significant association with adverse (still birth, NICU-admission, Low APGAR-score at 5^{th}-minute and ENND) perinatal outcomes. Deliveries with standard FHR record are 4.54 times more likely to have good outcomes compared to sub-standard records. [P=0.004, COR=4.517, 95%CI-1.637-12.576].

Substandard recording of liquor status also have statistically significant association with adverse outcomes. [P=0.007,COR=3.409,95%CI-1.405-8.271].But in the contrary perinatal outcomes are not affected by substandard and unrecorded recordings of cervical dilation, descent, maternal pulse , maternal blood pressure, maternal body temperature and uterine contraction on this table have no statistically significant association.(Table-7)

Table-7:- Association between quality of partograph recordings & perinatal outcomes JUSH- June-01/2014 - August -30/2014.

Parameters	Good outcome	Adverse outcome	Total	COR(95%CI)	P-Value	AOR (95%CI)	P-value
	N (%)	N (%)					
FHR Standard2- Substandard	259(88.1)	39(11.9)	294	4.54(1.6-12.6)	.0004	0.6(.2-2.0)	.041
	12(60)	8(40)	20				
Cerv.Di:-Substandard Standard	2(100) 277(87.7)	0(0) 39(12.3)	2 316	1.06(.3-4.0)	.98		
Descent:-Not recorded -Recorded	173(88.3) 106(86.9)	23(11.7) 16(13.1)	196 122	1.14(.6-2.3)	.72		
Pulse:-standard -substandard	239(88.2) 40(85)	32(11.8) 7(15)	271 47	1.04(.4-2.5)	.94		
Maternal BP:- Standard -substandard	253(87.5) 26(89.7)	36(12.5) 3(10.3)	289 29	1.05(.4-3.2)	.94		
Temp.:-standard -substandard	224(88.5) 55(84.6)	29(11.5) 10(15.4)	253 65	.95(.5-2.1)	.98		
Contraction:-stand. substandard	261(87.6) 18(90)	37(12.4) 2(10)	298 20	.23(.13-1.6)	.46		
Liquor:- Recorded -Not record	81(78.6) 99(89.2)	22(21.4) 12(10.8)	103 111	2.38(1.4-4.2)	.003	2.4(1.4-4.2)	0.03

*COR-Crude Odds ratio AOR-Adjusted OR P-value <0.05 significant association

5.9:- Association between quality of partograph recordings and maternal outcomes.

The study shows there was a statistically significant association between substandard monitoring of maternal body temperature and maternal outcomes. [P=0.032, COR=2.135, 95%CI-0.113-0.907]. On the other hand cervical dilation, descent, maternal PR, BP and uterine contraction monitoring per-protocol or not does not affect maternal outcomes.

Liquor status monitoring has a statistical significant association with outcomes. [P= 0.041, COR=1.340, 95%CI-1.032-4.418](Table-8)

Table-8:- Association between quality of partograph recordings and maternal outcomes JUSH- June-01/2014 - August -30/2014.

Parameters	Good outcome	Adverse outcome		COR(95%CI)	P-Value	AOR(95%CI)	P-Value
	N (%)	N (%)	Total				
Cerv.Di:-substandard standard	2(100) 284(89.9)	0(0) 32(10.1)	2 316	.76(.5-1.1)	.10		
Descent:-Not record -Recorded	173(88.3) 113(92.6)	23(11.7) 9(7.4)	196 122	.58(.3-1.3)	.19		
Pulse:-standard -substandard	244(90) 42(89.4)	27(10) 5(10.6)	271 47	1.80(.6-5.2)	.62		
Maternal BP:-Stand. -subst.	261(90.3) 25(86.2)	28(9.7) 4(13.8)	289 29	2.83(.7-11)	.16		
Temp.:-standard -ubstandard	230(90.9) 56(86.2)	23(9.1) 9(13.8)	253 65	2.14(.11-.91)	.03	.44(.08-.7)	.02
Contraction:-standard -substand.	268(100) 18(45)	0(0) 32(55)	268 40	.09(.8-12.9)	3.25		
Liquor:- Recorded -Not recorded	90(87.4) 104(93.4)	13(12.6) 7(6.3)	103 111	1.34(1-4.42)	.04	2.11(1-4.2)	.043

AOR=Adjusted Odd ratio COR-Crude Odds ratio P-value< 0.05 significant association

5.10:-The Association between NICU-admissions and Partograph recordings

From this table admission to NICU has statistically significant association with FHR-recording[P=0.007,COR=3.409,95%CI-1.405-8.271]and Maternal body temperature[P=0.03,COR=2.052,95%CI-1.070-3.937] but the other parameters like descent, uterine contraction , Blood pressure, pulse, cervical dilation do not have statistical association with NICU-admission.

Table-9:- Table shows the association between NICU-admissions and Partograph recordings- June-01/2014 - August -30/2014.

Parameters	Yes	No		COR(95%CI)	P-Value	AOR(95 %CI)	P-Value
	N (%)	N (%)	Total				
FHR :-Standard - Substandard	44(15) 9(37.5)	250(85) 15(62.5)	294 24	3.41(1.4-8.3)	.01	3.1(.36-4.3)	0.024
Cerv.Di:-standard - substand.	0(0) 53(16.8)	2(100) 263(83.2)	2 316	1.11(.3-4.2)	.88		
Descent:-Not record - Recorded	44(22.4) 19(15.6)	152(77.6) 103(84.4)	196 122	1.15(.6-2.2)	.66		
Pulse:-standard - substandard	37(13.7) 16(34)	234(86.3) 31(66)	271 47	.48(.2-1.2)	.10		
Maternal BP:-Stand. - subst.	43() 10()	246() 19()	289 29	.67(.23-2.1)	.481		
Temp.:-standard - substand	32(12.6) 21(32.3)	221(87.4) 44(67.7)	253 65	2.02(1.0-4)	.003	4.6(1.7-13)	0.008
Contraction:-stand. - substa.	48(16.1) 5(25)	250(83.9) 15(75)	298 20	1.57(.5-5.3)	.47		

CHAPTER-SIX:- DISCUSSION

This study found that from the total deliveries over the study period majority of them followed using modified WHO-partograph .The completion rate of partograph on this study was low (20.4%) but comparable with other studies done in other countries like Tanzania-2012- 32.1%, Kenya 2007-24%, Ghana-2013-25.6% and Other studies done in Ethiopia One in Bahari Dari -2013-29.3% and Addis Abeba-32.9% . There was no association between completion rate with maternal and fetal outcomes on this study unlike study done in Tanzania 2012- showed association between completeness with good fetal outcome but no association with maternal outcomes .[1]Most of labor parameters had recorded at least once in the partograph. These study findings show high proportion of partograph use in the hospital. Some of the partographs had no records for maternal pulse rate, descent of head, maternal body temperature, membrane status, molding, liquor status and uterine contraction. These findings show there are some improvements in some parameters recordings when compared with other studies which found high proportions of unrecorded parameters of labor in the studied partographs but still low when we saw overall recordings of parameters. [3,7].

Despite partographs were used in all women in labor, majority (79.6%) of them were judged substandard based on the recordings. This gives an impression that either labor monitoring in the hospital is poor or there is inadequate recording of labor parameters in the partogram. This high proportion of substandard recordings of labor parameter also was observed in Tanzania where 91.9% of records were substandard and only 8.1% of the partographs fulfilled out to the standards and the study done in Bahar Dari University Ethiopia in 2010 among those filled (58) partograph charts, only seventeen (29.3%) of them were properly filled. Whereas, the majority 41 (70.7%) of them were partially filled. The observation showed that plotting of fetal heart beat (FHB), initial cervical dilatation, 4 hourly cervical dilatation, descent of the fetus, uterine contraction, nature of the membrane, monitoring of maternal B/P, plotting of the graph across the alert or action line etc. was made for 79.3, 87.9, 60.3, 41.4, 60.3, 63.8, 36.2, and 39.3 percent respectively of the charts reviewed during the study which was comparable with this study [2, 7].

From the result of this study Fetal heart monitoring and liquor status are the most important parameters associated with adverse fetal outcomes. FHR-substandard in 7.5% of the parameters which is better than other studies done in Malawi only -3% [3] and Liquor status not recorded in 34.9% which is still better than other studies done in Tanzania-2%, Malawi-3% [2, 3] . From this study we found that the substandard FHR-monitoring has a statistical significant association with adverse (still birth, NICU-admission, Low APGAR-score at 5^{th}-minute and ENND) perinatal outcomes.

Substandard recording of liquor status also have statistically significant association with adverse outcomes. The substandard and lack of fetal heart rate monitoring is significantly associated with adverse fetal outcome and is about 4.6 times higher in those with substandard or lacking fetal heart rate monitoring in study done in Tanzania.[2]

In this study all partographs have recording parameters of cervical dilatation, Descent, maternal pulse rate, blood pressure, temperature and uterine contraction assessment which have no association with adverse fetal outcomes. But studies done in Tanzania shows association with uterine contraction recordings and perinatal outcomes but other parameters are similar with this study. [2]

From the total deliveries followed (318) 99.1% of them alive on delivery and of these their first minute APGAR-score less than or equal to three is 3.5% while 4 – 6 and seven and above are 27.4% and 69.2%. The 5^{th}-minute APGAR-score for majority of newborn (89.9%) more than six and only 2.2% of newborn have severe asphyxia ($\leq$3).Fetal weight for more than three-fourth of the newborn within normal birth weight (88.7%) while 5.7% of them are macrocosmic (>4000gm). Fetal sex distributions show female-44.7% and male -55.3%.Majority (82.1%) of neonate did not need resuscitation after delivery. About 16.7% of neonate referred to the NICU for which low APGAR-score is the major reason for referral (41.8%) and admitted there with admission diagnosis of PNA and Meningitis (18.2% each) and EONS and Me conium aspiration syndrome –diagnosed in 14.5% and 16.4% respectively of cases. O f the total newborns 76.4% discharged normal , 30% of them unknown on discharge and 6% of cases are died(include still birth and Early neonatal death) for which the cause of death unknown in more than two-third the cause (73.7%).

From this study we saw that admission to NICU has statistically significant association with FHR-recording and maternal body temperature but the other parameters like descent, uterine contraction, Blood pressure, pulse and cervical dilation do not have statistical association with NICU-admission. This association also seen other studies done India Rajiv Gandhi-in 2002 shows relation between APGAR-score and fetal outcome and studies from Uganda done to assess partograph use in labor , found that good Apgar score was statistically significant associated with standard fetal monitoring [16, 17]

From this study we saw that there is a statistically significant association between substandard monitoring of maternal body temperature and adverse maternal outcomes (PPH, Laceration, death, chorioamnionitis, postpartum sepsis etc).. This result is also similar with other studies done in Zambia shows association between partograph monitoring and maternal outcome but it was fails to associate with each partograph parameters .But on this study there was no statistically significant association between cervical dilation, descent, maternal PR, BP and uterine contraction monitoring per-protocol or not did not affect maternal outcomes.[10]

Liquor status monitoring has a statistical significant association with outcomes.

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATIONS.

7.1:-Conclusion

The study showed that there was partograph use in our hospital for labor monitoring. The completion of partograph in this study was-20.4%. But there was a substandard recording of parameters of the partograph. Substandard recordings of FHR, Liquor status and maternal body temperature measurement had statistically significant association with adverse fetal outcomes. This shows that there was association between quality of partograph recording and perinatal outcome

There was also statistically significant association with adverse maternal outcomes and substandard recordings of maternal body temperature and liquor status. This means there was association between quality of partograph recordings and maternal outcome.

7.2:-Recommendations.

- Set supervision mechanisms for improving intrapartum monitoring.
- Labor ward team should emphasize on the importance of using partographs.
- Training all health care workers who follow/supervise pregnant women on the use of the partograph and enforcing its use at all levels of care.
- Pre-service and periodic on-job training of health workers on the completion of the partograph and regular supportive supervision
- Needs further study to assess knowledge gap of partograph use on health professionals.

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ANNEXES

ANNEX I: QUESTIONAIRE.

PART I – SOCIODEMOGRAPHIC INFORMATIONS

1. Age in years …….. Card number……..
2. Address …… date of admission …… time of admission…….. Time interval between labor onset and hospital admission ---------- Hours
3. Ethnicity a) Oromo b) Amhara c) Tigrie d) Guragie e)Dawro f) other specify……
4. Religion a) Orthodox Christian b) Protestant c) Muslimd) f) other specify……
5. Occupation a) House wife b) Civil servant (employee)
   c) Farmer d) Merchant e) Others (specify)…….
6. Educational status a) Illiterate (can't read & write) b) Read &write only
   c) Grade 1-8 d) Grade 9-12 e) Grade >12 (specify) -----
7. Marital status a) Married b) Separated c) Divorced d) Widowed
8. Income of the family per month _____ Birr.

PART-II- ASSESSING FETAL WELL-BEING

1. Fetal heart rate - (1) Not recorded (2) Standard (3) Substandard
2. Membranes (1) Not recorded (2) Intact (3) Ruptured
3. Liquor status (1) Not recorded (2) Clear (3) Me conium stained
4. Molding (1) Recorded (2) Not recorded
5 .Gestational Age in weeks A. LNMP if known ……..… B. Amenorrhea.. ….....
   C. Early u/s…….. D .Urine HCG……..

PART-III PROGRESS OF LABOR

1. Cervical dilatation (1) Not recorded (2) Standard (3) Substandard
2. Descent (1) Not recorded (2) Recorded
3. Uterine contraction (1) Not recorded (2) Standard (3) Substandard
4. Any abnormality noted in cervical dilatation
   (1) None (2) Precipitated (3) Protracted (4) Arrest
5. Action taken (1) None (2) Augmentation with oxytocin (3) Operative delivery
6. Cervical dilatation at time of admission……cm.

PART-IV -MATERNAL CONDITION

1. Maternal Blood Pressure (1) not recorded (2) Standard (3) Substandard
2. Maternal body temperature (1) Not recorded (2) Standard (3) Substandard

3. Maternal pulse rates (1) Not recorded (2) Standard (3) Substandard

4. Urine test (1) Done (2) Not done.

5. Gravidity…… …… 6. Parity……

PART-V- MODE OF DELIVERY

(1) Spontaneous Vaginal delivery

(2) Assisted vaginal delivery (vacuum, forceps, destructive delivery)

(3) Caesarean section.

(4) Caesarean hysterectomy.

(5) Delivery summary (If vaginal delivery) 1.on partograph paper 2. Separate paper

PART-VI- FETAL OUTCOME

1. Outcome. 1. Alive 2. Dead 3. Weight…… 4. Sex (F, M)

2. Apgar score at- 1minute------- at 5 minute-------

3. Resuscitation done. (1) Yes (2) No

4. Admitted to neonatal ward for special care (1) Yes (2) No

5. If Yes, Reason ----- (1) Low APGAR-Score (2) Prematurity

(3) Low birth weight (4) others specify ----------

(5). Diagnosis made at neonatology for the referred cases (specify it) ----

6. Condition of neonates at discharge 1.died, 2. Improved, 3. Normal, 4. Unknown.

7. If there was neonatal death, what was the cause? Specify it----------

PART –VII- IMMEDIATE MATERNAL OUTCOME

1. Good.

2. Estimated blood loss at delivery in Milliliters----------

3 -Is there any problem encountered during delivery? A) Yes B) no

4. If yes for question no-3 what is/are the problem?

A) Uterine atony B) Genital tract laceration C) Perineal tears

D) Maternal death E) Uterine rupture F) Others (specify) ----------

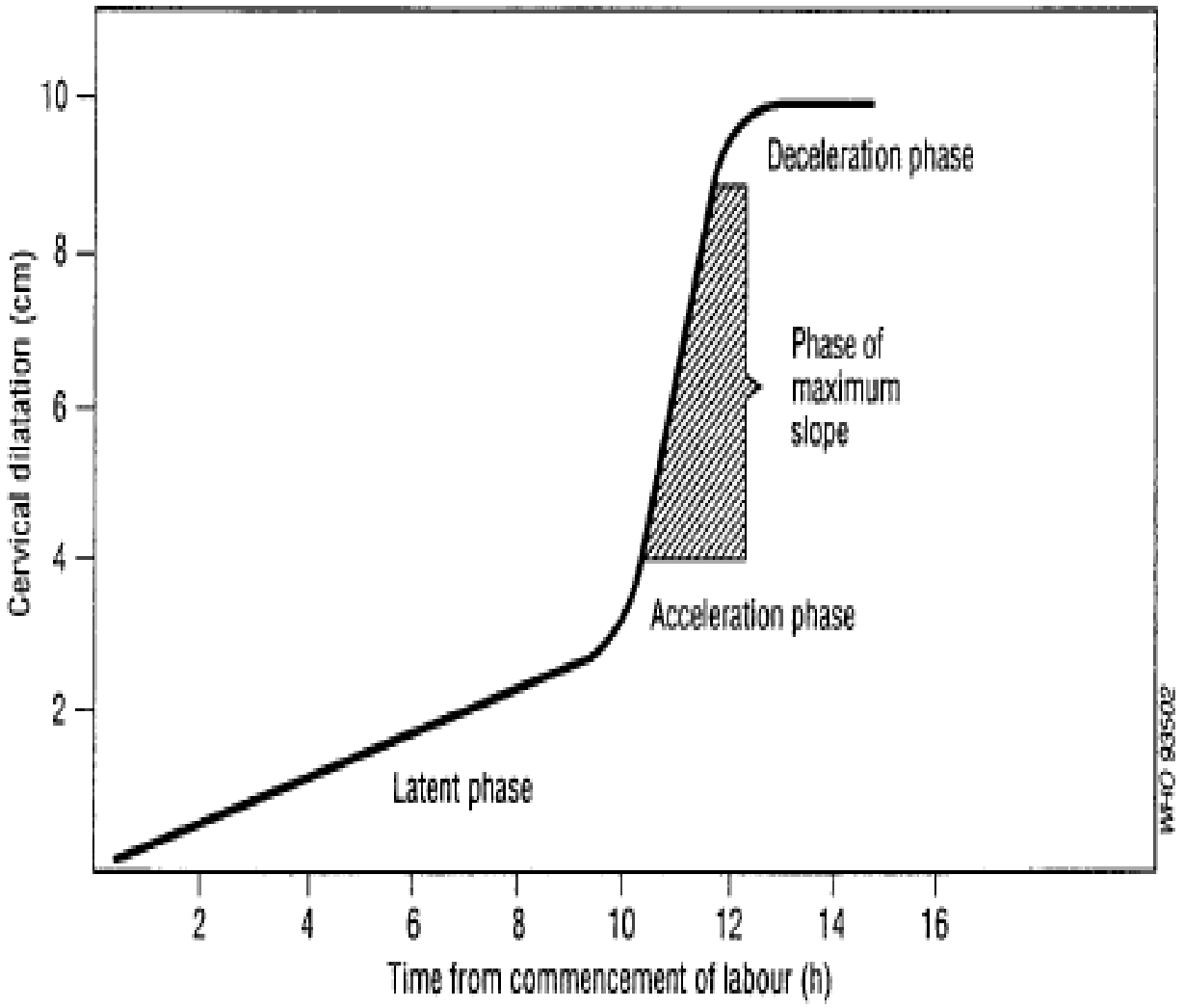
.If there was maternal death, what was the cause? Specify----------

Name of Data collector……

Signature……

Date of collection……

Annexes-2 :-Figures of Partograph



Friedman's curve showing phase of maximum slope

Fig-2- Friedman's Partograph

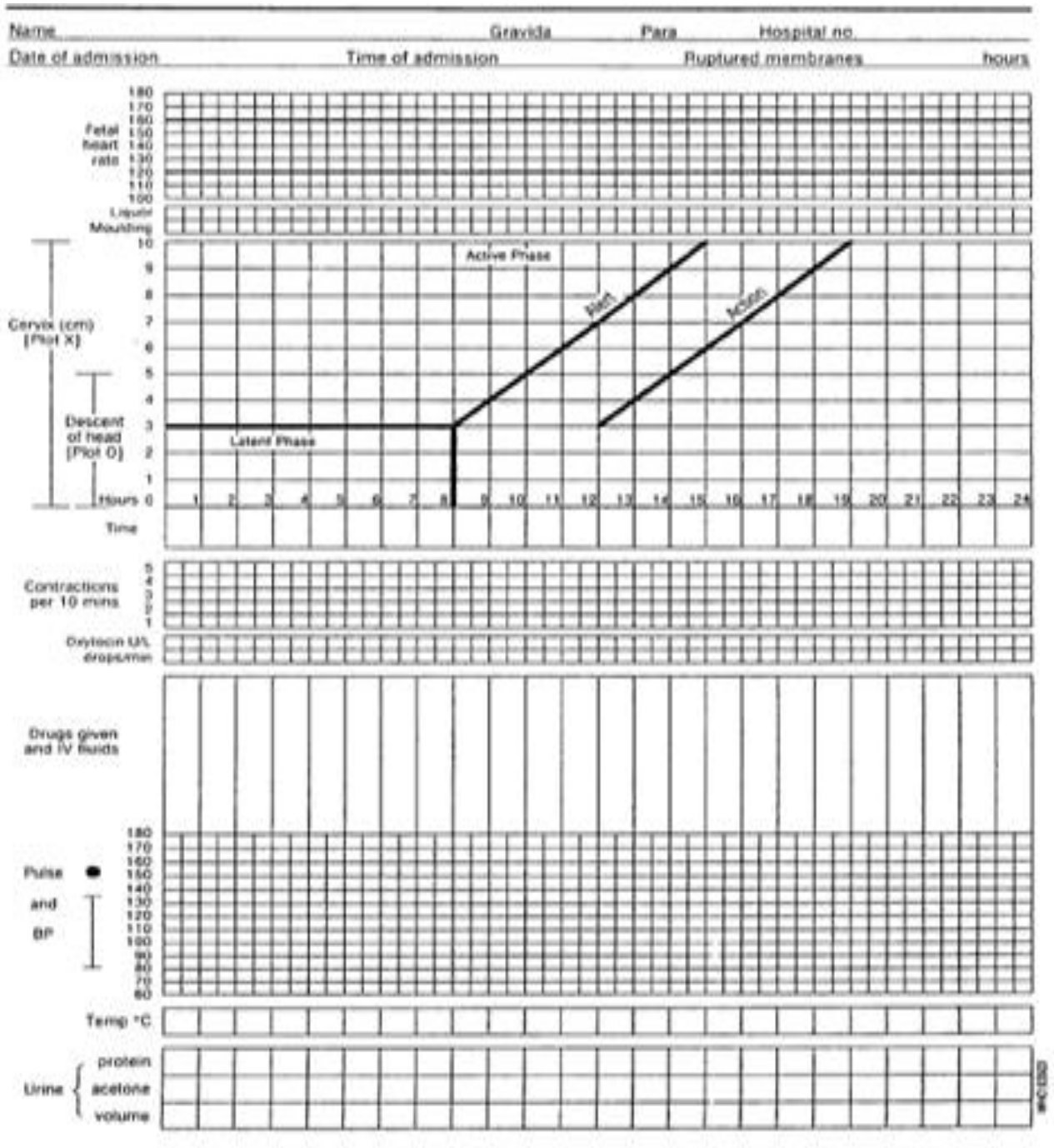


Fig-4- Modified WHO-Partograph