

# Partograph Utilization and Factors Associated with Poor Perinatal Outcomes in Wolaita Sodo University Referral Hospital, Southern Ethiopia

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## Abstract

**Background:** Maternal deaths remain a major public health problem worldwide. The World Health Organization (WHO) has recommended the use of modified WHO partograph to monitor labour and delivery, in order to improve delivery care and reduce maternal and perinatal mortality rate. **Objective:** This study was aimed to assess utilization of partograph and factors associated with perinatal outcomes among women who delivered at Wolaita Sodo University teaching referral hospital. **Methods:** A facility based cross-sectional study was conducted from September 10\_25, 2015 by conducting partograph review. A total of 309 partographs were included in the study by using simple random sampling technique from the total frame of women who gave birth in the last one year and whose delivery was followed by partographs. A Pre-tested and structured checklist was used to collect data. Descriptive analysis was conducted and tables and graphs and summary statistics were used to depict data. Binary logistic regression analysis was conducted to check for variables that show association with neonatal outcomes at P value of 0.05. Finally, multiple logistic regression was conducted to identify factors independently associated with fetal outcomes. Odds ratio with 95% Confidence interval was used to claim for statistical significance. **Results:** Out of 309 total of charts reviewed, only for 58%, 3.2% and 2% of mothers monitoring of fetal heart rate, liquor status and molding was done respectively. Labour parameters (cervical dilation, station and uterine contractions) were monitored to the standard in 155(50%), 12(3.9%) and 170(55%) respectively. Apgar score at 5<sup>th</sup> minute was  $\geq 7$  in 268(86.7%) neonates and resuscitation was done in 65(21%). 46(14.9%) of neonates were admitted to Neonatal Intensive Care Unit (NICU) for special. Most of the mothers 287(92.9%) had good outcome and only 22(7.1%) of them developed immediate adverse outcomes: There were significant association ( $p < 0.05$ ) between perinatal outcomes and factors like neonatal resuscitations, Apgar score at 1<sup>st</sup> minute and liquor quality. **Conclusion:** This study showed poor quality of partograph utilizations; despite good perinatal and immediate maternal outcomes. Hence, responsible departments and offices should be encouraged to ensure proper partograph utilization.

**Keywords:** Perinatal outcome, partograph, Wolaita sodo teaching and referral hospital

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## 1. BACKGROUND

Maternal deaths remain a major public health problem worldwide. Many women die annually due to complications of pregnancy, labour and delivery. Though global maternal mortality rates have declined in the last 15 years, still it remains unacceptably high [1].

Globally, there were an estimated number of 289,000 maternal deaths in 2013. About 85% of these deaths occurred in sub-Saharan Africa and Southern Asia. The sub-Saharan Africa region alone accounted for 62% of maternal deaths followed by Southern Asia. Each year, approximately 2 million babies die because of complications of childbirth, primarily in settings where effective care at birth, particularly prompt C/S, is unavailable [2,3-6].

Ethiopia is one of the country adopting this policy in reduction of maternal and child deaths by three-quarters and two-third respectively, over the period of 1990 to 2015 G.C. MMR and child mortality rate reduction is on fast track to achieve MDGs and is currently estimated to be at 420/100,000 and 64/1000 live births respectively [7].

A modified WHO 'partograph' includes three components: which are: the fetal condition, the progress of labor and the maternal condition. according to WHO protocol: FHR, uterine contraction and maternal pulse rate are recorded half hourly AND Membranes status, molding, Cervical dilatation, descent, temperature and urine output assessed 4 hourly. [8-11].

In addition to maternal outcomes, Adverse neonatal outcomes in terms of 5 minutes (Apgar score  $< 7$ ), early neonatal deaths and intrapartum stillbirth are also considered to be the best indicator for the quality of health care

services [11].

In Ethiopia, currently maternal mortality rate at the national level is 420 deaths per 100,000 live births and the child mortality rate is 64 deaths per 1000 live births (7). These figures are still high when compared to other countries. Stillbirth account for over half of all perinatal deaths globally. One third of stillbirths takes place during delivery and is largely avoidable [ 9-11 ].

Given the high maternal and perinatal morbidity and mortality, several interventions have been identified as important for curbing this high mortality rates. These interventions include the early detection of the abnormal progress of labour by the use of the partograph(12).

This study was aimed at assessing the quality of partograph utilization if they are done as per standard and whether the its use have effect on the maternal outcome and on the fetal outcome. This study will be able to state whether, and to what extent, the partograph was used in the selected facility, as well as to generate information on problem areas and challenges in the use of partograph.

## GENERAL OBJECTIVE

To assess utilization of partograph and factors associated with perinatal outcomes among women who delivered at wolaita sodo university teaching referral hospital

## SPECIFIC OBJECTIVE

1. To assess partograph utilization according to the WHO standards
2. To identify factors associated with perinatal outcomes .

## METHODS

### Study area and period

A facility based study was conducted from September 2014 - August 2015 at Woliata Sodo Teaching and Referral Hospital (WSTRH), Southern Ethiopia. Woliata zone is one of the large and densely populated zone in the Southern Ethiopia. Sodo town is the capital city of the zone, located at a distance of 326 km south from Addis Ababa, capital city of the country and 165 km west from Hawasa, capital city of the region. WSTRH is established in 1928 as a Zonal Hospital in Wolaita zone, Sodo town. Currently, It is serving people in catchment area and beyond more than 3 million people. There are over 80,000 people are visiting outpatient department per year and a total of over 250 beds in the wards; which is on medical, pediatrics, surgical, gynecologic and obstetric wards. Out of these, 45 beds in Obstetrics and Gynecology ward.

### Study design

Facility based cross sectional study was conducted.

### Source and study population

All women who delivered at WSTRH during September 2014 - August 2015 were our source population while all randomly selected partographs of women in stated period were a study population.

### Inclusion criteria

All women delivery cards with partographs in the referral hospital from September 2014 to August 2015.

### Exclusion Criteria

The following characteristics of charts are excluded from the study:

- Those who were admitted with cervical dilatation  $\geq 8$  cm , Missed and unfulfilled charts, those who were diagnosed with Antepartum hemorrhage, Multiple pregnancy , Preeclampsia/eclampsia, Premature labor, Malpresentations (Non-cephalic presentation)
- Neonates diagnosed with fetal distress on admission

### Sampling Size

The minimum sample size required for the study was estimated by using a single proportion formula:  $n = z^2_{(a/2)} p(1-p)/d^2$ . Where  $n$ = sample size,  $z$  = standard normal deviate set at 1.96 (for 95% confidence level),  $d$  = desired degree of accuracy (0.05) and  $p$ = proportion of proper partograph recording of cervical dilatation = 32.9% [13], which is better monitored compared to other partograph parameters. Hence, the total sample size was 339. Total number of women delivered at WSTRH. during the study period was 3,483. Since, the sample was taken from a relatively small population, the required minimum sample size was obtained from the correction formula:  $n_f = n_o / 1 + (n_o / N)$ . Where;  $n_f$  = final sample size,  $n_o$ = initial sample size and  $N$ = total number of delivery within the study period was obtained from the registration logbook, which was less than 10,000 ( $N = 3,483$ ). Consequently, the corrected final sample size became 309.

### Sampling technique

- Partographs of women whose labor was monitored using partograph delivered in the hospital within the study period was selected by simple random sampling technique

### Data collection instruments

Checklist was used to collect the information from the recorded partographs. A pilot study and pre-test was

conducted for one day to assess the flow of variables in the checklist, easy ways of obtaining information and other important aspects in the nearby hospital.

#### **Data collection procedures**

The data was collected through record review using pre-tested structured checklists. The procedure of data collection from records was: looking for the files, reviewing the files for presence of partograph in it. If partograph is used, it was reviewed for maternal identifications, labour, fetal and maternal parameters, birth outcomes and immediate maternal outcomes.

#### **Data quality assurance**

To assure the quality of the data regular checkup for completeness and consistency of the data was made on daily basis by the investigator and supervisor. A pre-test was arranged where the checklists were assessed as well as data collectors practiced the data collection procedures.

#### **Data management and analysis**

Prior to analysis, data cleaning, coding, checking for normality, completeness was done. Then data was entered into SPSS version 20.0. Descriptive statistics were computed to determine the proportion of the partograph. The results were presented using tables, figures and charts. Bivariate logistic regression was used to check association of independent variables with the dependent variable and those variables which showed association at P value of 0.05 were selected to be candidates for final model. Then, multivariable logistic regression analysis was conducted to identify predictors of fetal outcomes. Odds ratio with 95% confidence interval was used to determine statistical significance.

#### **Operational definitions**

##### **Protocols of standard care [11, 14]:**

- Cervical dilatation, descent, molding, liquor status, temperature, blood pressure and urine output monitored every four hourly was considered Standard.
- Fetal Heart Rate: Maternal pulse and uterine contractions monitored every 30 minutes was considered Standard.
- Note; if the parameters were not recorded at all was marked as Not recorded and if recorded but not according to standard as above was marked as substandard.
- **Poor neonatal outcomes:** Include those newborns with Apgar score below 7 at 5 minutes, Stillbirth and admission to the neonatal ward for special care. If there were no such conditions, they were considered as good neonatal outcome.
- **Adverse immediate maternal outcome:** Includes those mothers who developed; uterine rupture, genital tear, PPH, need blood transfusion or death during follow up with partograph and immediately after delivery. If the mother developed none of the above, it is considered as good immediate maternal outcome.

#### **Ethical considerations**

The study was conducted after ethical clearance was obtained from the Research and ethical Committee of the Wolaita Sodo University. During data extraction from the documents selected for the study, names of clients/patients to whom the documents belonged were not taken and as such the data remained anonymous.

## **RESULTS**

After reviewing the total of 3483 delivery records in the hospital from September 2014 - August 2015, only about half 1,879(53.9%) partograph charts met the inclusion criteria and therefore included in the sampling frame.

The mean age of the mothers was 25.93 years (standard deviation (SD) = 5.34) and ranged between 16 - 40 years. Majority 167(54%) of them were in the age group of 25 - 35 years. About 178(57.6%) of them were primiparous and only 18(5.8%) of them had gestational age of more than 42 weeks. Majority 237(76.7%) of them presented to the hospital after 12 hours of onset of labour and 120(38.8%) of them admitted after rupture of membranes and 30(9.7%) of them with meconium stained liquor and liquor status was not recorded in majority of mothers(63.4%). In 129(41.7%) of the charts, partograph use started at 4cm cervical dilatation (**Table 1**).

**Table 1:** Distribution of maternal characteristics delivered, WSTRH, Southern Ethiopia, Sept. 2014 - Aug. 2015

Mothers characteristics		Frequency(n=309)	Percent(%)
Maternal age	15-24 years	118	38.2
	25-35 years	167	54
	>35 years	24	7.8
Parity	Primiparous	178	57.6
	Multiparous	131	42.4
Gestational age	37-42 weeks	291	94.2
	> 42 weeks	18	5.8
Duration of labour	<18 hours	159	51.5
	≥ 18 hours	150	48.5
Membranes status on admission	Intact	189	61.2
	Ruptured	120	38.8
Liquor quality (color)	Not recorded	196	63.4
	Clear	71	23
	Bloody	12	3.9
	Meconium stained	30	9.7
Duration of membranes ruptured	< 8 hours	72	23.3
	≥ 8 hours	48	15.5
Time interval between onset of labour and hospital admission	<12 hours	72	23.3
	≥ 12 hours	237	76.7
Cervical dilation at first partograph recording started	4cm	129	41.7
	5cm	68	22.1
	6cm	50	16.2
	7cm	62	20

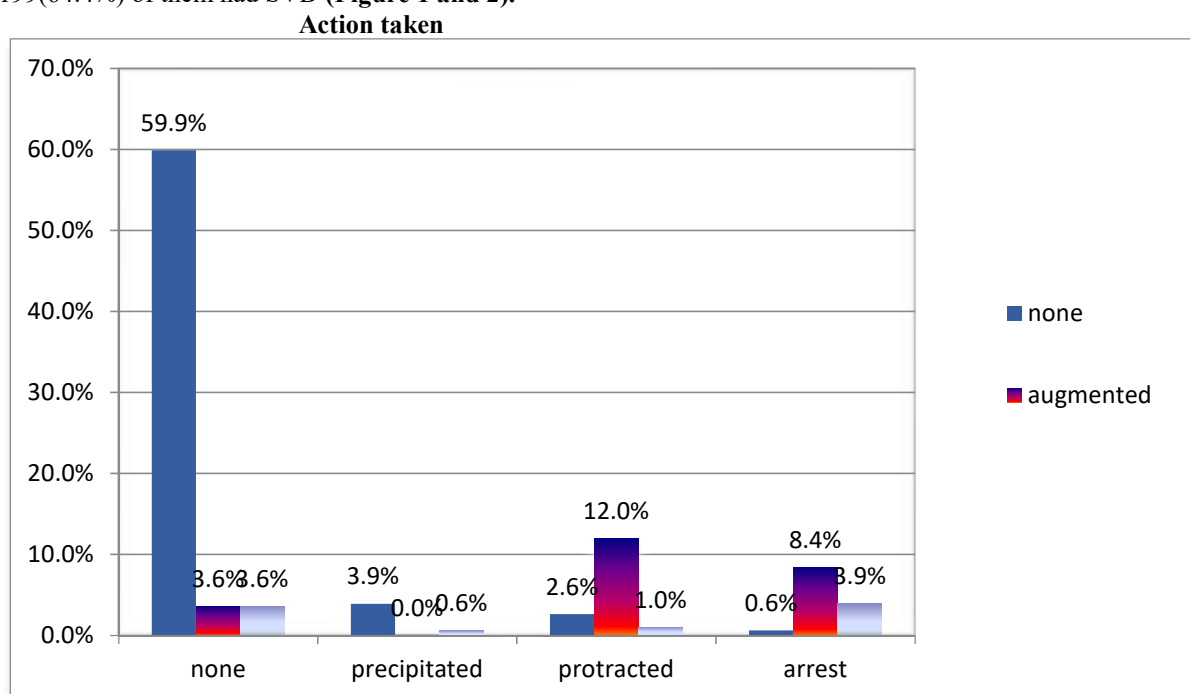
Out of 309 total of charts reviewed; FHR was monitored to the standard in 179(58%), liquor status was in 10(3.2%), and molding was in 6(2%). labour parameters (cervical dilation, station and uterine contractions) were monitored to the standard in 155(50.1%), 12(3.9%) and 170(55%) respectively and action line crossed in 45(14.6%) of the charts. But on the maternal conditions: maternal body temperature, maternal BP, maternal pulse, and urine out put were recorded according to the standard in 10(3.2%), 46(14.9%) 32(10.4%) in 4(1.3%) respectively.

**(Table 2).Table 2:** Quality of partograph utilizations, WSTRH, Southern Ethiopia, Sept.2014 - Aug.2015

Parameters of partograph		Frequency(n=309)	Percent(%)
FHR	Not recorded	2	0.6
	Substandard	128	41.4
	Standard	179	58
Liquor status	Not recorded	196	63.4
	Substandard	103	33.4
	Standard	10	3.2
Molding	Not recorded	246	79.6
	Substandard	57	18.4
	Standard	6	2
Cervical dilatation	Not recorded	12	3.9
	Substandard	142	46
	Standard	155	50.1
Alert line crossed	Yes	87	28.2
	No	222	71.8
Action line crossed	Yes	45	14.6
	No	264	85.4
Descent	Not recorded	234	75.7
	Substandard	63	20.4
	Standard	12	3.9
Uterine contractions	Not recorded	8	2.6
	Substandard	131	42.4
	Standard	170	55

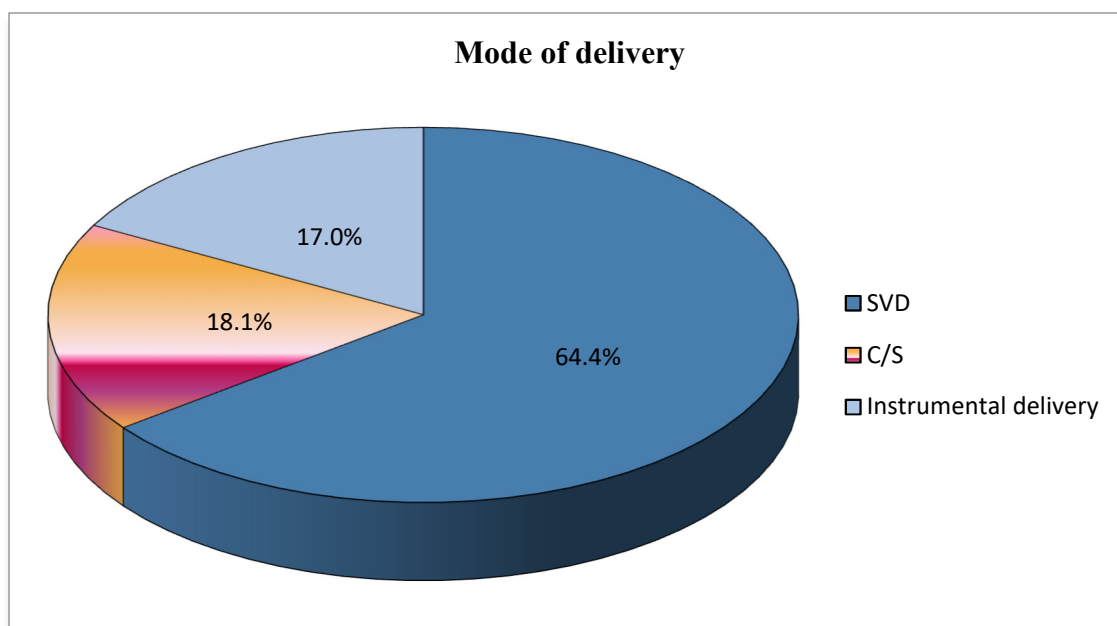
Parameters of partograph		Frequency(n=309)	Percent(%)
Maternal Body temperature	Not recorded	222	71.8
	Substandard	77	25
	Standard	10	3.2
Maternal BP	Not recorded	78	25.2
	Substandard	185	59.9
	Standard	46	14.9
Maternal Pulse rate	Not recorded	137	44.3
	Substandard	140	45.3
	Standard	32	10.4
Urine output	Not recorded	289	93.5
	Substandard	16	5.2
	Standard	4	1.3

Among those protracted and arrest disorders of cervical dilatations 37(12%) and 26(8.4%) were augmented; 3(1%) and 12(3.9%) underwent operative delivery respectively. With regard of mode of delivery, majority 199(64.4%) of them had SVD (Figure 1 and 2).



**Abnormality noted in cervical dilatation**

**Figure 1:** Abnormalities noted in cervical dilatation and action taken, WSTRH, Southern Ethiopia, Sept.2014 - Aug.2015



**Figure 2:** Mode of delivery, WSTRH, Southern Ethiopia, Sept.2014 - Aug.2015

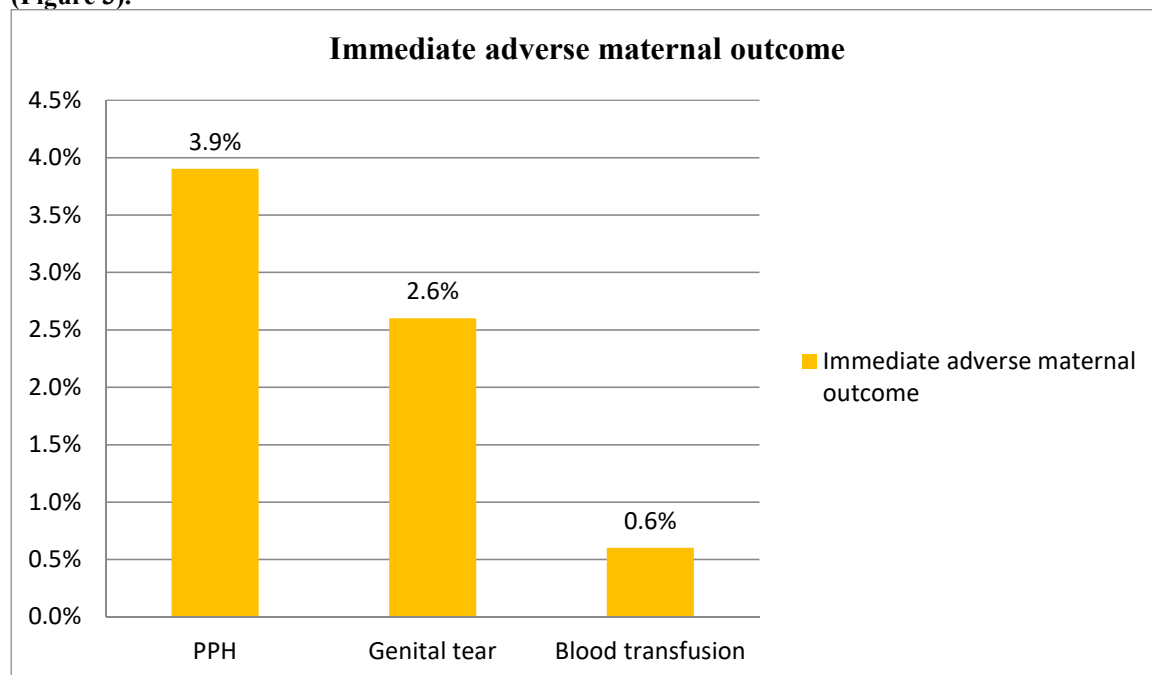
Regarding perinatal outcome: about 62(20.1%) of neonates had poor outcomes; among these 16(5.2%) born stillbirth (intrapartum), 41(13.3%) had Apgar score <7 at 5<sup>th</sup> minutes and 46(14.9%) of them admitted to NICU for different reasons (**Table 3**).

**Table 3:** Proportions of perinatal outcome, WSTRH, Southern Ethiopia, Sept.2014 - Aug.2015

Variables	Frequency(n=309)	Percent (%)	
<b>Baby born</b>	Alive	293	94.8
	Stillbirth (Intrapartum)	16	5.2
<b>Apgar score at 1<sup>st</sup> min.</b>	<7	85	27.5
	≥7	224	72.5
<b>Apgar score at 5<sup>th</sup> min.</b>	<7	41	13.3
	≥7	268	86.7
<b>Neonatal sex</b>	Male	161	52.1
	Female	140	45.3
	3*	8	2.6
<b>Weight. (in kg)</b>	< 2.5 kg	11	3.6
	2.5 - 4.0 kg	230	74.4
	> 4.0 kg	34	11
	555**	34	11
<b>Resuscitation done</b>	Yes	65	21
	No	244	79
<b>Admitted to neonatal ICU</b>	Yes	46	14.9
	No	263	85.1
<b>Reasons for admission to neonatal ICU</b>	Low apgar score	18	5.8
	Abnormal weight	8	2.6
	Meconium aspiration	6	1.9
	Birth asphyxia	6	1.9
	Others(congenital anomalies, abnormal breathing, unable to suck)	8	2.6
<b>Perinatal outcome</b>	Good outcome	247	79.9
	Poor outcome	62	20.1

\*=Missed sex \*\*=Missed weight

Out of 309 delivery records, only 22(7.1%) of mothers developed immediate adverse outcomes. 12(3.9%) of them developed PPH, 8(2.6%) had 3<sup>rd</sup> degree genital tear and only 2(0.6%) of them got blood transfusion. No uterine rupture, 4<sup>th</sup> degree genital tear, cervical tear and death reported after partograph utilizations in the hospital

**(Figure 3).**

**Figure 3:** Immediate adverse maternal outcomes among mothers delivered, WSTRH, Southern Ethiopia, Sept. 2014 - Aug. 2015

#### Factors that affect perinatal and maternal outcomes

Dependent and independent variables were cross tabulated with each perinatal and maternal outcomes. There were no significant statistical association between perinatal outcome with maternal age, gestational age, parity, FHR, molding, cervical dilation and uterine contractions.

In bivariate analysis there were statistically significant association ( $P < 0.05$ ) of perinatal outcome with neonatal resuscitation, Apgar score at 1<sup>st</sup> minute, duration of labor, mode of delivery, liquor quality (color), liquor status and descent. The variables that were significant in bivariate analysis; neonatal resuscitation, Apgar score at 1<sup>st</sup> minute, duration of labor, descent and liquor quality had also statistically significant association with perinatal outcome in multivariate logistic regression analysis.

Those who were not resuscitated were about 4 times more likely to have poor neonatal outcome than those who were resuscitated [AOR=3.930, 95% CI: (1.231- 12.543)]. Those whose their Apgar score  $\geq 7$  at 1<sup>st</sup> minute were about 97.4% less likely to have poor neonatal outcome than who were delivered with Apgar score of  $< 7$  at 1<sup>st</sup> minute [AOR=0.036, 95% CI: (0.012- 0.112)]. Those who were with clear liquor were about 97.1% less likely to have poor neonatal outcome than those who had meconium stained liquor [AOR=0.029, 95% CI: 0.005-0.164]. As well as, those who had standard recording of descent of the presenting part were about 8.5 times more likely to have good neonatal outcome than those whose descent were not recorded at all [AOR= 8.467, 95% CI: 1.254-57.154]. And those whose duration of labor were less than 18hours duration had about 65.8% less likely to have good neonatal outcome than those whose labor duration were more than 18hours [AOR= 0.342, 95% CI: 0.136-0.855] (Table 4).

**Table 4:** Bivariate and multivariate analysis of perinatal outcome with quality of partograph utilizations, WSTRH, southern Ethiopia, Sept. 2014 - Aug. 2015

Variables		perinatal outcome		OR ( 95% CI )			
		Good outcome	Poor outcome	P- Value	COR(95% CI)	P- Value	AOR(95% CI)
Mode of delivery	SVD	169(54.7%)	30(9.7%)	0.016	0.422(0.209, 0.850)	0.132	2.602(0.749, 9.041)
	C/S	40(12.9%)	16(5.2%)	.903	0.950(0.417, 2.163)	0.303	1.937(0.550, 6.826)
	I/D	38(12.3%)	16(5.2%)		1		1
Duration of labor	<18hours	139(45%)	20(6.5%)	0.001	0.370(0.205, 0.667)	0.022	0.342(0.136, 0.855)
	≥18hours	108(35%)	42(13.6%)		1		1
Liquor quality (color)	Not recorded	150(48.5%)	46(14.9%)				
	Clear	65(21%)	6(1.9%)	0.003	0.185(0.060,0.571)	0.001	0.029(0.005,0.164)
	Bloody	12(3.9%)	0	0.999		0.998	
	Meconium stained	20(6.5%)	10(3.2%)		1		1
Descent	Not recorded	190(61.5%)	44(14.2%)		1		1
	Substandard	51(16.5%)	12(3.9%)	0.965	1.016(0.500, 2.065)	0.969	0.977(0.307, 3.112)
	Standard	6(1.9%)	6(1.9%)	0.015	4.318(1.329, 14.027)	0.028	8.467(1.254, 57.154)**
Liquor status	Not recorded	150(48.5%)	46(14.9%)		1		1
	Substandard	91(29.4%)	12(3.9%)	0.016	0.430(0.216, 0.854)	0.752	0.600(0.025, 14.149)
	Standard	6(1.9%)	4(1.3%)	0.244	2.174(0.588, 8.037)		
Apgar score at 1 <sup>st</sup> minute	<7	32(10.4%)	53(17.2%)		1		1
	≥7	215(69.6%)	9(2.9%)	0.001	0.025(0.011, 0.056)	0.001	0.036(0.012, 0.112)
Resuscitation done	Yes	25(8.1%)	40(12.9%)	0.001	16.145(8.307, 31.380)	0.021	3.930(1.231, 12.543)**
	No	222(71.8%)	22(7.1%)		1		1

\*\* Statistical significant in backward stepwise logistic regression

## DISCUSSION

In this study there were relatively good recording of FHR(58%), cervical dilatation(50.1%) and uterine contractions(55%) to the recommended standard when compared to the study conducted in public health institutions of Addis Ababa where 129(30.7%) of FHR, 138 (32.9%) of cervical dilatation and 87 (20.70%) of uterine contractions were recorded [14 ]; Jimma university specialized hospital only 10.5% fulfill standard record [11]; and Uganda 2% of FHR [15]. However, our result showed low quality of utilization when compared to the study done in Amhara region 79.3%, 60.3%, 60.3% respectively [8], Kenya 53-90% [16]) and almost consistent with the study conducted in Ghana [17]. This discrepancy might be due to sample size differences, study times and areas.

The low standard recordings in moldings(2%), liquor status(3.2%), descent(3.9%) and all maternal conditions (temperature, BP, Pulse rate and urine output): 3.2,14.9,10.4 & 1.3percents respectively were observed but high recordings were done in Amhara region: liquor state(63.8%), descent(4.4%) and BP(32.2%) (8); public health institutions of Addis Ababa: liquor status(26.9%) and BP(18.6%) [14] and Ghana: molding, liquor state, descent and BP & Pulse rate were 32.5, 33.9, 55 and 40 percents respectively [15]. This inconsistency might be due to less skill in determining molding and descent or placed less emphasis on its importance in the progress of labour and maternal conditions in this setup.

In present study, the various parameters recorded to substandard ranged from 5-60% of the cases, with the lowest recording of maternal urine output. It is higher than the study done in Ghana(19-35.5%) [15] and Kenya, most of parameters [16]. On the other hand, the study conducted in Tanzania was 86% of the cases recorded to substandard [18], which is higher than this findings. This gives an impression that either labor monitoring in the



hospital is poor or there is inadequate recording of parameters in the partograph.

In this study, majority of fetal parameters: liquor state 196(63.4%) and molding 246(79.6%); labor parameter: descent 234(75.7%) and maternal parameters: temperatures 222(71.8%) and urine output 289(93.5%) were not recorded at all. Similar with the study conducted in public health institutions of Addis Ababa; molding in 86.7% and descent in 84% not recorded [14]. This indicates very poor practice in utilization of partographs which are designed as a tool to monitor the laboring mothers.

In the present study, finding was good regarding neonatal outcome ; Apgar score at 5<sup>th</sup> minute  $\geq 7$  in 268(86.7%), resuscitated in about 65(21%) and admitted to neonatal ICU for special care in about 46(14.9%) of the cases. Some reasons for admission to neonatal ICU were; 18(5.8%) low Apgar score, 8(2.6%) abnormal weight, 6(1.9%) meconium aspiration and birth asphyxia and others (congenital anomalies, abnormal breathing and unable to suck) accounts 8(2.6%).

The study has shown overall perinatal outcome as good in 247(79.9%) and poor outcome in 62(20.1%). The fetal outcomes in 253 (80.0%) of the cases Apgar scores at 5<sup>th</sup> minute was greater than or equals to seven, 44 (14.1%) were admitted to special nursery unit, in Jimma university specialized hospital [11]. Which is almost similar with this study. This study also consistent with the findings in Egypt [28] and Tanzania [18 ].

Almost half of the duration of labour was  $\geq 18$ hours (48.5%) and about 237(76.7%) of the cases came to hospital after 12hours. However, in Jimma university specialized hospital (27 (8.6%) of cases their duration of labor was greater than /equals to 18hours [11]; but, none of the cases present beyond 12 hours in India; admission to neonatal ICU decreased from 17% to 6%, C/S reduced from 44% to 21% [19]. This discrepancy might be due to shortage of infrastructures to come early to the hospital in this study, or other possible reason might be lack of awareness.

There were 16(5.2%) intrapartum stillbirths among the reviewed partographs. In the reviewed partographs there were no details of these still births. Somehow, consistent with the study conducted in Jimma University specialized hospital 24(7.7 %) neonate died during the first 6hours of delivery [11].

Those who were not resuscitated were about 4 times more likely to have poor neonatal outcome than those who were resuscitated [AOR=3.930, 95% CI: (1.231, 12.543)] and those whose their Apgar score of  $\geq 7$  at 1<sup>st</sup> minute were about 97.4% less likely to have poor neonatal outcome than who were delivered with apgar score of  $< 7$  at 1<sup>st</sup> minute [AOR=0.036 , 95% CI: (0.012, 0 .112)].

This result was similar with what had been observed in Jimma university specialized hospital, Iraq and Brazil [11, 21, 22]. However, it is different in Ghana, in which Apgar score at 1<sup>st</sup> and 5<sup>th</sup> minute has no different significant associations [17]. The possible explanations for this contrast might be due to variation in study setup and disparity in judging birth outcome as good or poor; including maternal outcome.

#### LIMITATIONS OF THE STUDY

- The study also didn't include the progress of neonates who were admitted to NICU because of its being retrospective
- Missed recordings of important parameters didn't allow conducting further analysis affecting perinatal outcomes.

#### CONCLUSION

The present study showed only about of half of deliveries were attended using partographs and among those whom partograph was utilized ,most of important parameters were not recorded according to modified WHO partograph. This missing of recording contributed to the poor maternal and perinatal outcomes. Furthermore it put difficulty to further analysis of data. There were significant association ( $p < 0.05$ ) between perinatal outcomes and neonatal resuscitations, Apgar score at 1<sup>st</sup>min, duration of labor, descent and liquor quality.

#### Recommendation

Ensuring availability of the pre-printed partograph at all maternity units and periodic monitoring of partograph availability in each card would help to ensure utilization. Moreover, the WHO partograph should be used in all maternity units with incorporated management guidelines so that the laboring women, their babies & also health care providers can benefit-

Health care providers training on importance of utilization and proper recording should be strengthened.

All stake holders of maternal and child health units starting from department head to hospital directors, zonal and regional officers and other non governmental actors should be informed and sensitized about partograph proper utilization and availability.

Further prospective study needed on extent of partograph utilization assessing knowledge and attitude and practice of obstetric care givers at this hospital.

#### Competing interest

The authors declare that they have no competing interests

### Financial competing Interest

The authors also declare that they have no financial and non-financial competing interests

### Author's contribution

GC : Conceived the study, GC, BT, KD, Participated in the design of the study and performed the statistical analysis, GC, BT, KD, Interpreted the data: GC : Obtained ethical clearance and permission for study and Supervised data collectors. BT: Drafting the article or revisiting it critically for important intellectual content. All authors read and approved the final manuscript.

### Authors' information

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