Utilization of partograph during labour: A case of Wolaita Zone, Southern Ethiopia

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ABSTRACT

The World Health Organization recommends the utilization of partograph for all laboring mothers. Partograph is a cost-effective, single sheet of paper that is used to follow maternal and fetal condition and progress of labour. Obstructed and prolonged labours are major causes of maternal deaths. These causes can be minimized by routine utilization of partograph. However, several maternal and fetal deaths occur in health facilities due to poor quality of labour follow-up. Therefore, this study aims to assess the utilization of partograph and associated factors among obstetric care providers working in Wolaita zone health facilities, Southern Ethiopia.

An institution-based cross-sectional survey was conducted from April to May 2016. A pretested and structured self-administered questionnaire was used to collect the data. Data entry and analysis was conducted using SPSS Version 21.0. Logistic regression was used to identify associations. A P value < 0.05 were considered as statistically significant.

Of a total of 442 participants, 73.6% utilize partograph routinely. From the total variables in the study, a midwifery profession showed a significant association with the dependent variable (AOR = 4.7, 95% CI: 1.8 – 12). The utilization of partograph in the study area was low as per the World Health Organization recommendation. This study recommends that assigning midwives in the obstetric ward other than other health professionals will increase the routine utilization of partograph.

1. Introduction

Globally, 295,000 mothers died each year due to pregnancy and related complications in 2017. Ninety-four percent of maternal deaths occur in lower and middle-income countries. Sub-Saharan Africa and Southern Asia alone account for 86% of global maternal deaths [1].

Even though childbirth is a globally celebrated event; Ethiopian maternal mortality is 420 per 100,000 live births in 2016 [2] compared to six per 100,000 live birth in developed countries like the UK and Australia [3]. Major causes of maternal mortality are preventable through evidence-based interventions. The top five direct causes of maternal mortality in Ethiopia are hemorrhage, hypertensive disorder, sepsis, abortion, and obstructed labor (prolonged labor). Obstructed labour in Ethiopia is estimated to cover 7.7% of maternal deaths [4]. Postpartum hemorrhage, uterine rupture, fistula, puerperal sepsis and asphyxia, fetal death, and neonatal sepsis are the main complications of obstructed labor in both a mother and a fetus [5, 6].

World Health Organization recommends the utilization of partograph to assist care providers in early diagnosis and management of obstructed labor. Partograph is a single sheet of paper where maternal care providers utilize to monitor labour progress, fetal and maternal condition while a mother is in the active first stage of labour. This tool has great support in the early identification of fetal distress and prevents further complications of meconium...
aspiration syndrome. Therefore, obstetric care providers at all levels are expected to utilize this tool to reduce labor complications. Even though partograph is a simple and easily available tool, its utilization across African countries including Ethiopia, is very low [7, 10, 12].

Care providers profession, knowledge, and attitude towards utilization of partograph, availability of a partograph sheet, poor staff numbers, and inadequate training were mentioned as a factor for poor utilization of partograph sheet [12, 13]. Thus, the main objective of this study was to determine the level of utilization of partograph and associated factors among obstetric care providers working in Wolaita Zone health facilities.

2. Methods and materials

2.1. Study area and period

This study was conducted in Wolaita Zone health facilities from April to May 2016. Wolaita Zone is one of 14 zones in southern nations nationalities and people regional states of Ethiopia. In the zone, there are 12 woredas and three town administrations, with a total of 373 kebeles, with 294 rural and 79 urban kebeles. Based on the 2007 Census report, the zone has an estimated total population of 1,501,112 in 2016. According to the zonal health department report, there were 419 health facilities; 8 hospitals, 69 health centers, and 342 health posts. There were 1490 health care workers [14]. The health center is a primary health care unit (PHCU). The individual health center has five satellite health posts. Each health center is expected to serve 25,000 population and their satellite health posts expected to serve a maximum of 5,000 populations. Each health post is connected to the health center by a referral system. Primary hospitals, general hospitals and, specialized hospitals serve populations of 100,000, 1.5 million, and 5 million respectively. The health coverage of the study site was reported to be 100% [15].

2.2. Study design

A facility-based cross-sectional survey was conducted to assess the utilization of partograph among obstetric care providers in Wolaita Zone health facilities, Southern Ethiopia.

2.3. Population

The source populations were all obstetric care providers in Wolaita Zone health facilities. All obstetrics care providers who are working in the delivery unit of health facilities in Wolaita Zone were considered as the study population.

2.4. Sample size and sampling procedure

2.4.1. Sample size determination

Sample size determined based on single population proportion formula: $N = \left(\frac{Z_{a/2}}{d}\right)^2 \times p \times (1 - p)/w^2$ with the assumptions, confidence interval (CI) = 95%, proportion (P) = 40.2% [12], margin of error (d) = 5%, $Z_{0.025} = 1.96$, 5% non response rate, total sample size became 387.

2.4.2. Sampling procedure

Wolaita zone has 428 health facilities; 8 hospitals (1 teaching hospital, 2 general hospitals, 5 primary hospitals), 69 health centers, and 351 health posts. Of total health facilities, 8 hospitals and 69 health centers provide maternal health care services. Through, investigators' preliminary survey, from total health facilities in the zone that provides maternal health care service (8 hospitals, and 69 health centers) there were 486 obstetric care providers at the study period. The preliminary survey was conducted to help the researchers to identify current actively participating obstetric care providers at the study site during the study period. The result showed, nearly 27 participants were on leave during the data collection period. The total calculated sample size (387) and available obstetric care providers (459) were nearly equal. Therefore, all obstetric care providers at the time of the data collection period were included in the study (459).

2.4.3. Inclusion and exclusion criteria

The survey was conducted among all obstetric care providers who were working in the delivery ward which includes; midwives, nurses, public health officers, medical doctors, and masters in emergency surgery and obstetrics. Those providers who were in annual, maternity, sick leave, not found within three visits, and not volunteer to participate were excluded from the study.

2.5. Variables

Sociodemographic characteristics (age, sex, profession, qualification, year of experience, type of health facility), knowledge, attitude towards utilization of partograph, and training on partograph are the independent variables while utilization of partograph is the dependent variable.

2.6. Data collection tool and procedure

Questionnaires were developed from related articles [3, 8, 9, 10, 15, 20]. Data were collected through a structured and pretested self-administered questionnaire. The questionnaire contained both open-ended and closed-ended questions and it chiefly focused on sociodemographic characteristics, knowledge, and attitude on the utilization of partographs. 

Before administering the questionnaire, a detailed description of the study and data collection tool was provided for participants, and consent was obtained. Data were collected by eight bachelor degree health professionals nurses, midwives, and health officers.

2.7. Data quality control

To ensure validity, pretest was conducted on 22 obstetric care providers in Halaba health facilities. Following the pretest ambiguous words and order of questions amended accordingly. Content validity was assured through proof reading and expert evaluation of the questionnaire.

A pretest was conducted to assess the reliability of the questionnaire. Cronbach’s Alpha was conducted for an objective which formed a scale and it measures ($\alpha = 0.8$).

Two days of training was given for data collectors and supervisors on study objectives, questionnaire, and sample data collection. All data collectors had a degree in health science. Onsite supervision was undertaken by the supervisors and investigators during the data collection period.

2.8. Measurements

2.8.1. Knowledge about partograph

Knowledge of utilization of partograph was assessed based on ten knowledge questions. Correct answers were given “1” grade and “0” for incorrect responses. Knowledge score for individual participants was gained by summing up the score for the correct answer given to selected questions in the questionnaire. Knowledgeable participants were those who score above mean value (>5) to knowledge assessing questions. While not knowledgeable were those who score below mean value (<5) [20].

2.8.2. Attitude

Participants’ attitude towards utilization of partograph was measured using thirteen attitude assessing questions through a 5-point Likert scale. As participants responded strongly agree for a positive attitude, a score of 5 was given, and 1 for those who responded as strongly disagree. The above points were reversed for those negative attitude questions. By
taking the mean score as a cutoff point, the favorable attitude was a score of ≥6, and below mean were considered as unfavorable attitudes.

2.8.3. Utilization of partograph
To assess utilization of partograph, participants first asked whether he/she has been practicing partograph to monitor labor or not. If they responded ‘yes’, a participant was questioned how often did they practice; Occasionally, sometimes or routinely. Partograph utilizers in this study were those who use partograph routinely for all laboring mothers.

2.8.4. Data processing and analysis
The collected data were checked manually for completeness and coded. Data template format was prepared in SPSS version 21 and data entered by two independent data clerks for error checking, then analyzed through SPSS version 21. The strength of associated variables with the dependent variable was examined through the odds ratio. Backward stepwise multivariate logistic regression analysis was conducted to assess the effects of independent variables and to control confounders. In bivariate p-value ≤ 0.2 were considered as a candidate for multivariate logistic regression. Odds ratio with 95% CI, p-value ≤ 0.05 were used to declare a statistical significance. Descriptive statistics, frequencies, tables, and graphs were used to report the data.

2.8.5. Ethical consideration
Ethical approval was obtained from Wolaita Sodo University College of Health Science and Medicine Ethical Review Committee. A permission letter was obtained from Wolaita Zone Health Department followed by respected health facilities. Finally, written informed consent was obtained from each participants. To keep the confidentiality of the research data, a personal identification of participants was not included.

3. Results
In this study, a total of 442 obstetric care providers participated obtaining a response rate of 96.3%.

3.1. Socio-demographic characteristics of obstetric care providers
The majority of participants were females 237 (53.6%). The mean age of respondents was 27.97 (SD 3.71). Two hundred eighty (63.3%) of obstetric care providers were midwives. The majority of obstetric care

| Variables                      | Value(N) | Percentage (%) |
|--------------------------------|----------|----------------|
| Sex                            |          |                |
| Female                         | 237      | 54             |
| Male                           | 205      | 46             |
| Age                            |          |                |
| 20–24                          | 76       | 17             |
| 25–29                          | 217      | 49             |
| 30 and more                    | 149      | 34             |
| Health Facility                |          |                |
| Government Hospital            | 216      | 49             |
| Health Center                  | 135      | 30             |
| Private Hospital               | 91       | 21             |
| Profession                     |          |                |
| Midwifery                      | 280      | 63             |
| Nurse                          | 63       | 14             |
| Public Health Officer          | 23       | 5              |
| Doctors                        | 48       | 11             |
| Emergency Surgeons             | 28       | 6              |
| Qualification                  |          |                |
| Diploma                        | 196      | 44             |
| BSc and above                  | 239      | 54             |
| Other                          | 7        | 2              |
| Experience                     |          |                |
| 1–5                            | 283      | 64             |
| 6–9                            | 132      | 30             |
| 10–18                          | 27       | 6              |
| Knowledge on utilization partograph |          |                |
| Knowledgeable                  | 120      | 27             |
| Not knowledgeable              | 322      | 73             |
| Attitude towards partograph utilization |          |                |
| Favorable                      | 193      | 44             |
| Unfavorable                    | 249      | 56             |

Public Health Officers: health professionals who are certified with the public health officer profession and are working in the maternity ward. Medical doctors: health professionals who are certified with doctorate profession and are working in the maternity ward. Midwives: health professionals who are certified with the midwifery profession and are working in the maternity ward. Masters in emergency surgeons: health professionals who do their masters on emergency surgery of medical and obstetrics. Nurses: health professionals who are certified in the nursing profession and are working in the maternity ward. Other: obstetrics and gynecology residents, intern doctors.

Abbreviation: BSc.: Bachelor of Science.
providers were bachelor’s degrees and above in their qualification 239 (54.1%) (Table 1).

3.2. Knowledge and attitude of obstetric care providers towards utilization of partograph

The overall knowledge of participants on the utilization of partograph was 322 (73%). The majority 427 (96.6%) of participants had learned partograph while they were in college or university. More than half 252 (57%) of participants had received on the job training. Participants with a favorable attitude were 193 (44%) (Table 1).

3.3. Utilization of partograph and factors associated with utilization

Out of the total participants, 413 (93.4%) utilizes partograph and 29 (6.6%) were not utilizing partograph. From 413 (93.4%) participants who claimed utilization of partograph, 304 (73.6%) utilized partograph routinely, 56 (13.5%) sometimes and 53 (12.8%) occasionally.

From 29 (6.6%) participants who were not utilizing partograph, 17 (58.62%) were due to the utilization of different monitoring tools. Of the total 109 participants who were utilizing partograph sometimes or occasionally 86 (79%) were due to the utilization of different monitoring tools (Figure 1).

3.4. Factors associated with utilization of partograph

Out of four variables which were a candidate in bivariate logistic regression analysis, age (P value-0.2 COR = 0.5 with 95% (0.1,1.4)), profession midwife (P value - 0.01 COR = 10.1 with 95% (2.6–39)), attitude (p value-0.1 COR = 2.1 with 95% (0.9,5.1)) and knowledge (p value - 0.05 COR = 0.4 with 95% (0.1,1.2)), midwifery profession was significantly associated with the dependent variable in multivariate logistic regression. Being a midwifery professionals (p value 0.001) were about 5 times more likely to utilize partograph routinely than other professionals (AOR = 4.7 with 95% CI (1.8–12)) (Table 2).

4. Discussion

In this study level of utilization of partograph was found to be 73.5% (95% CI: 69.2–78.4). This is consistent with the study conducted in Gambia (78%) [16]. The result is higher than the study conducted in Addis Ababa which is 57.3% [11], North Showa Zone, 40.2% [12], Ethiopian hospitals 13% [17], the Amhara region 29% [8], and Uganda 30% [18]. The difference might be due to methodology, study period, and area differences. However, the result is lower than a cross-sectional study conducted in eastern Ethiopia which is 92.6% [19], and Niger Delta 98.8% [20] This difference might be due to differences in a study area and partograph implementation strategy. Moreover, the difference might be due to differences, in knowledge of participants which is 53.7% [19] and 84% [20] respectively. Another potential explanation for result difference could be, the study in Nigeria include health extension workers which were not a participant in this study [21]. On the other hand, the result in Niger Delta region of Nigeria might be higher since their participants were all midwives, which potentially have much exposure and practice than other professions.

In the present study, a profession has a significant association with the dependent variable. The odds of being a midwife is nearly 5 times higher than those of general practitioners and health officers on the utilization of partograph. This is in line with the study conducted in North Showa Zone. Which states those who are midwives in a profession are 8 times more likely to practice partograph than other professions [12]. Moreover, this result is similar to the research conducted in 19 hospitals in Ethiopia [17]. This might be due to the main job of midwives is in the maternity ward and they may practice partograph more frequently than other professions. Surprisingly unlike other studies in the present study knowledge and attitude do not show a significant association with the dependent variable. This might be justified, even if the participants are knowledgeable and have a favorable attitude, their utilization highly affected by other factors.

This study presented reasons for not utilizing partograph totally and for not utilizing routinely. Using different monitoring tools, partograph unavailability, shortage of staff, and work overload were mentioned as a major reason in both cases. This report is similar to the study conducted in North Showa Zone [12], South Africa and Nigeria [9, 22].

5. Conclusion

A proportion of utilization of partograph in the study area was found to be low based on the World Health Organization recommendation on routine utilization for all laboring mothers. A care provider profession shows a significant association with the dependent variable. Thus, assigning midwives in the labor ward is recommended to enhance utilization.

5.1. Limitation of the study

Data is collected through a self-administered questionnaire. This may result in social desirability and response bias which could be avoided by observing while the professionals were utilizing the partograph. However, data quality measures which include the provision of study information prior to administering the questionnaire, pretest of the questionnaire, and supervision during data collection were the scientific techniques used to minimize the effect of the limitation of the study.

Figure 1. Reasons for not practicing partograph, 2016 (n1 = 29, n2 = 109).
Table 2. Factors associated with utilization of partograph; Southern Ethiopia, 2016 (n = 442).

| Variables                  | Utilization of partograph | OR (95% CI) | P-value |
|----------------------------|---------------------------|-------------|---------|
|                            | Utilized [N (%)]          | Not utilized [N (%)] | COR | AOR |
| Age                        |                           |             |         |
| 20–29                      | 276 (62.4)                | 17 (3.8)    | 0.51 (0.18–1.44) | 0.67 (0.26–1.70) | 40   |
| >30                       | 137 (31)                  | 12 (2.7)    | [1] (Reference) | [1] (Reference) |      |
| Profession                 |                           |             |         |
| Midwife                    | 272 (61.5)                | 8 (1.8)     | 10.188 (2.6–39) | 4.7(1.8–12) | .001* |
| Nurse                      | 54 (12.2)                 | 9 (2)       | 1.915 (0.512–7.163) | 1.036 (0.389–2.758) | .944 |
| Other professionals*       | 88 (19.9)                 | 11 (2.5)    | [1] (Reference) | [1] (Reference) |      |
| Knowledge                  |                           |             |         |
| Knowledgeable              | 309 (69.9)                | 13 (2.9)    | [1] (Reference) | 0.553 (0.242–1.266) | .161 |
| Not knowledgeable          | 104 (23.5)                | 16 (3.6)    | 0.487 (0.187–1.269) |          |      |
| Attitude                   |                           |             |         |
| Favorable                  | 177 (40)                  | 16 (3.6)    | [1] (Reference) | 1.85 (0.847–4.056) | .122 |
| Unfavorable                | 236 (53.4)                | 13 (2.9)    | 2.175 (0.913–5.177) |          |      |

* = P-value <.05. Bold value indicates the significant variable.
Abbreviation: AOR– Adjusted Odds Ratio. COR– Crude Odds Ratio. CI- Confidence Interval.

* Other professionals—emergency surgeons, doctors, and health officers.

Declarations

Author contribution statement

K. Melese and B. Weji: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.
T. Bereheto and E. Bekiru: Analyzed and interpreted the data; Wrote the paper.

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Declaration of interests statement

The authors declare no conflict of interest.

Additional information

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