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Estimating partograph utilization and associated factors among health care professionals in Ethiopia: a systematic review and Meta – analysis

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Abstract

Background: Partograph is the prestigious obstetric tool used to monitor labour, predict and follow the progress of labor, maternal and fetal conditions. It allows the health care professionals to increase the frequency of follow up and to prevent prolonged labour, uterine rupture, postpartum hemorrhage, puerperal sepsis, stillbirths, birth asphyxia, and neonatal sepsis. There are various studies on partograph utilization and associated factors in different regions of Ethiopia, they present inconsistent findings and no study was conducted which shows the national estimate of partograph utilization in Ethiopia. Thus, this review was conducted to estimate the national pooled prevalence of partograph utilization and associated factors in Ethiopia.

Methods: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline was followed for this systematic review and meta-analysis. The databases used were; PUBMED, Cochrane Library, Google Scholar, EMBASE, African Journals Online Google scholar, maternity and infant care database and online repositories. A combination of search items: "partograph utilization", "knowledge and utilization of partograph", "documentation of partograph", "partograph and health professionals", "intrapartum monitoring using partograph" and/or "Ethiopia" were used. Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument (JBI-MAStARI) was used for critical appraisal of studies. Descriptive information of studies was presented in narrative form and quantitative results were presented in forest plots. The Cochran Q test and I2 test statistics were used to test heterogeneity across studies.

The meta-analysis was conducted using STATA 11 software. The pooled Meta logistic regression was computed to present the pooled prevalence and relative risks (RRs) of the determinate factors with 95% confidence interval (CI).

Result: A total of 15 studies were included in this meta-analysis with a sample size of 4,553. The national pooled prevalence of partograph utilization was 57.1 %. In subgroup analysis, the highest prevalence of partograph utilization was observed in Oromia (66.10%) and the lowest in Tigray (50.66%), increased utilization of partograph was observed after 2016 (62.75%). Statistically, a significant association was observed between partograph utilization and midwifery profession female health care profession, having short in-service Emergency Obstetric and Newborn Care training, Knowledge of partograph, short Training on partograph.

Conclusion: The pooled prevalence of partograph utilization during labour was low. There was a statistically significant association was between partograph utilization and midwifery profession, female health care profession, having short in-service Emergency Obstetric and Newborn Care training, Knowledge of partograph, short Training on partograph.

The concerned body should intervene on the identified factors to increase the utilization of partograph during labour and delivery.

Keywords: Partograph utilization, Systematic review, Meta-analysis, Ethiopia.

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Introduction

Partograph is a composite graphical record of key data during labour and delivery. It is a simple, effective, and low coast single paper sheet which has quality-of-care benefits that go beyond effective labour monitoring and management, including increased interaction between health care providers, improved continuity of care and the condition of women [1, 2].

For more than 2 decades now, Maternal and Infant Mortality Reduction have been a goal of several International and National Welfare programs. Although, partograph has been viewed as very helpful to avoid the maternal and neonatal complications related to prolonged and obstructed labour; not being utilized properly to monitor the first stage of labour especially in the resource-limited country [3,4].

Every day, approximately 1000 women die from preventable causes related to pregnancy and childbirth, those are not merely numbers but precious mothers with name and face, who had been a pillar of the family. As of 2015, the Global maternal mortality ratio is 216, of that 99 % of MMR are in developing regions and sub-Saharan Africa alone accounting for roughly 66%, followed by Southern Asia [5].

In Ethiopia, maternal mortality ratio has been stagnant so far, which is 412 per 100,000 live births. The top five causes of maternal mortality in Ethiopia; hypertension 10-12%, hemorrhage 25%, unsafe abortion 20-40%, infection and Obstructed Labor 10% and uterine rupture cover 9% of maternal deaths. Among those causes of maternal death obstructed labour, infection, uterine rupture and hemorrhage can be prevented by the fortunate utilization of partograph during labour and delivery [6-8].

Thus, the World health organization (WHO) had produced and recommended universal utilization of partograph for its plotting in every birth. Its routine use improves care during labour, increase the frequency of follow up, decrease unnecessary intervention, and reduce prolonged labour and its squeal including obstructed labour, maternal exhaustion, uterine rupture, stillbirths, birth asphyxia, and neonatal sepsis, postpartum hemorrhage, puerperal sepsis, obstetric fistula [5,9-11].

Training on partograph, knowledge of partograph, female health professionals, level of education, health care professional's level of education, work overload, lack of partograph and health facility difference like heath center and higher institutions were factors that affect partograph utilization. Additionally [12-17].

The Ethiopian government is the first in Africa, rich in publicly stated commitments and has adopted partograph for labour management in the country and the standardized use is recommended for use in all delivery units, aimed at reduction of maternal mortality. Different studies in the country revealed that poor utilization of partograph with poor documentation of components of pantograph in the country, ranging from 6.9% in Oromia and to 92.6% in Dire Dawa [18,19]. These studies showed inconsistent findings and poor documentation of the components of partograph. As a result, this systematic review and meta-analysis were conducted to assess the magnitude of partograph utilization and determinant factors in Ethiopia and this will help program coordinators, policymaker and other responsible stakeholders who are working on maternal and child health issue to have updated data on the status of partograph utilization and associated factors..

Materials and Methods

The protocol of this systematic review and meta-analysis on Estimating partograph utilization and associated factors among health care professionals in Ethiopia: a systematic review and Meta-analysis were designed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols (PRISMA-P 2015) Guidelines [20].We used the databases used were; PUBMED, Cochrane Library, Google Scholar, EMBASE, African Journals Online, maternity, and infant care database and online repositories. The search for published studies was not restricted by time, and all published articles up to January 01/2020 were included in the review. A search of the reference list of already identified studies to retrieve additional articles was done. Combination of search items: "partograph utilization", "knowledge and utilization of partograph", "documentation of partograph", "partograph and health professionals", "intrapartum monitoring using partograph" and/or "Ethiopia" were used.

First, the title and abstract of the paper were critically reviewed; duplicated data and papers whose titles were irrelevant for this study were excluded here. Then, full documents of the papers read and reread to screen for review. Finally, only 15 [15,16,21-33] studies conducted in different parts of Ethiopia met the inclusion criteria to this systematic review to assess partograph utilization and determinant factor.

Inclusion and exclusion criteria

Inclusion criteria:

- Study design; all study design.
- Time frame: all studies published up to January/01/2020
- Publication type: both published and unpublished studies.
- Language: Published studies only in the English language were included.
- Place of study: studies conducted in Ethiopia, which are institutional-based.
- Outcome: studies that reported the outcome (partograph utilization)

Exclusion criteria:

- Studies which did not report the level of partograph utilization
- Studies which had methodological problems.

Data extraction and quality assessment

All authors (AA, BF) extract the data independently form papers included in this study using a standardized data extraction tool adapted from Meta-Analysis of Statistics Assessment and Review Instruments JBI [34]. From each included studies, author's name, year of study, year of publication, study design, sample size, response rate, odds ratio (OR) and the possible associated

factors of partograph utilization was extracted.

The quality of the studies using the Joanna Briggs Institute (JBI) quality appraisal checklist [35]. The disagreement between the reviewers was solved by rereading the articles and by the negotiation of the reviewers.

Publication bias and heterogeneity

Publication bias and heterogeneity were assessed. To check the publication bias, a funnel plot was used. The distribution of studies and a p-value <0.05 were used to declare publication bias. The heterogeneity of studies was checked using the Q test and I2 test statistics. A value of 25%, 50%, and 75% was used to state the heterogeneity test as low, medium and high heterogeneity respectively. The random effect model of analysis was used with the evidence of heterogeneity. Funnel plot and Egger regression asymmetry tests were used to check the existence of publication bias.

Statistical analysis

To estimate the national pooled prevalence of partograph utilization necessary data from each study were extracted by using the Microsoft Excel spreadsheet. Then Meta-analysis was conducted using State 11 software. Publication bias was assessed using Egger's test. The percentage of variations between studies due to heterogeneity was tested using I2 test statistics. I2 test statistics result of 25%, 50%, and 75% was declared as low, moderate and high heterogeneity respectively [36]. Subgroup analysis was done by study region and year of study.

Results

Studies included in the meta-analysis

Initially, a total of 820 studies were identified from electronic databases and 200 papers were screened and excluded due to duplication; the remaining 350 articles were excluded by screening the title and abstract of the studies. Additionally, 255 full-text articles were excluded for methodological error and not reporting the outcome variable. Finally, 15 studies were included in this study [15, 16, 21-33] **Figure 1**.

Characteristics of Included Studies

In this study, a total of 15 studies were included [15, 16, 21-33] with a sample size of 4,553 were included. Of which, five studies [16, 25, 28, 30, 32] were conducted in southern Nations Nationalities and Peoples Regional State, three [21, 22, 26] in Amhara, three [27, 29, 31] in Oromia, two [15, 33] in Tigray, one [23] in Addis Ababa and one [24] in Dire Dawa city administration. All included studies were conducted with a cross-sectional study design. The highest prevalence of partograph utilization was reported in Dire Dawa (92.6 %) [24] and the lowest in the Oromia region (6.9%) [31] **Table 1.**

Overall pooled prevalence of partograph utilization in Ethiopia

This Meta-analysis included 15 studies to estimate the national pooled prevalence of partograph utilization. The overall pooled of prevalence of partograph utilization was 57.21 %(95%CI:

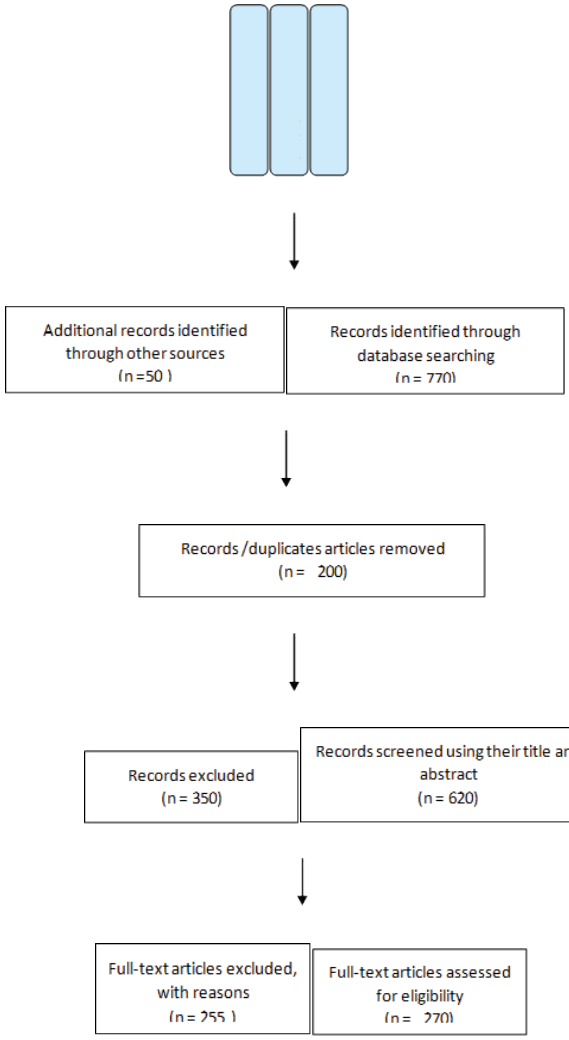

Figure 1 PRISMA 2009 Flow diagram for identification and selection of articles for inclusion in the review.

40.77, 73.66%). The heterogeneity among the 15 studies used to estimate the pooled prevalence of prevalence of partograph utilization was marked (I^2 = 99.5% and P≤ 0.001). Subgroup Meta-analysis was done by study region and year of study with the evidence of marked heterogeneity. Thus, the pooled prevalence of partograph utilization was high in Oromia (66.10% (95%CI: 26.52, 105.68)) and the least was in Tigray (50.66 %(95%, CI: 35.34, 65.98)). Similarly, the subgroup analysis by year of study showed that partograph utilization was increased in studies conducted after 2016 (62.57% (95%CI: 43.95, 81.19). Studies conducted before 2015, showed low partograph utilization, 54.59% (95%CI: 32.33, 76.85) **Figure 2 and table 2.**

Publication bias

Funnel plot was assessed for asymmetry distribution of prevalence of partograph utilization by visual inspection **Figure 3**. Egger's regression test showed with a p-value of 0.817 indicated that no publication biase.

Sensitivity analysis

This systematic review and meta-analysis showed that the point

Table 1 Descriptive summary of fifteen included studies in the systematic review and meta-analysis of partograph utilization in Ethiopia, 2019 (n=15).

Authors	Year of study	Study region	study design	Sample size	Prevalence of Partograph utilization(95% CI)	Quality (JBI check list)
Fantu A	2012	Amhara	Cross sectional	381	29.00(24,44,33.68)	Low risk
Habtamu R	2017	Oromia	Cross sectional	224	89.10(85.02,93.18)	Low risk
Wakeshe W	2015	Oromia	Mixed	266	84.60(80.26,88.94)	Low risk
Negash W	2013	Amhara	Cross sectional	403	40.20(35.41,44.9)	Low risk
Haymanot M	2015	Dire Dawa	Cross sectional	441	92.60(90.16,95.04)	Low risk
Tesfay H	2017	Tigray	Cross sectional	220	73.30(67.45,79.15)	Low risk
Desalegne A	2015	Amhara	Cross sectional	273	53.80(47.89,59.71)	Low risk
Kidist E	2016	SNNP	Cross sectional	300	51.00(45.34,56.66)	Low risk
Kidest G	2016	SNNP	Cross sectional	442	72.60(68.44,76.76)	Low risk
D.Markos	2014	SNNP	Cross sectional	401	70.20(65.72,74.68)	Low risk
Engida Y	2012	Addis Ababa	Cross sectional	202	57.30(50.48,64.12)	Low risk
Sena B	2012	Oromia	Cross sectional	340	6.90(4.21,9.59)	Low risk
Gutema C	2015	SNNP	Cross sectional	309	53.90(48.34,59.49)	Low risk
Daniel	2016	SNNP	Cross sectional	127	26.00(18.37,33.63)	Low risk
Haftom G	2015	Tigray	Cross sectional	233	57.40(51.05,63.75)	Low risk

Table 2 Sub-group analysis of prevalence of partograph utilization in Ethiopia by region and year of publication.

Sub group	Number of studies included	Prevalence (95% CI)	Test of heterogeneity, I^2	*p*-value
By region				
Amhara region	3	40.89 (27.40, 54.38)	95.3	< 0.001
Oromia region	5	66.10 (26.52, 105.68)	99.5	< 0.001
SNNPR	5	54.98(40.81-69.14)	97.2	< 0.001
Tigiray	2	65.40 (49.82, 80.98)	92.3	< 0.001
By publication year				
≤ 2015	10	54.59(32.33-76.85)	99.6	< 0.001
≥ 2016	5	62.57(43.95-81.19)	98.4	< 0.001

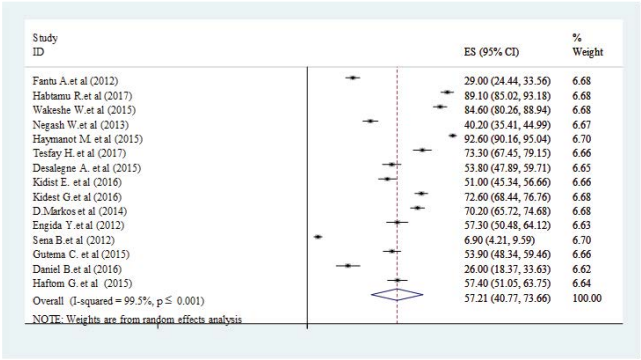

Figure 2 Forest plot displaying the Pooled prevalence partograph utilization.

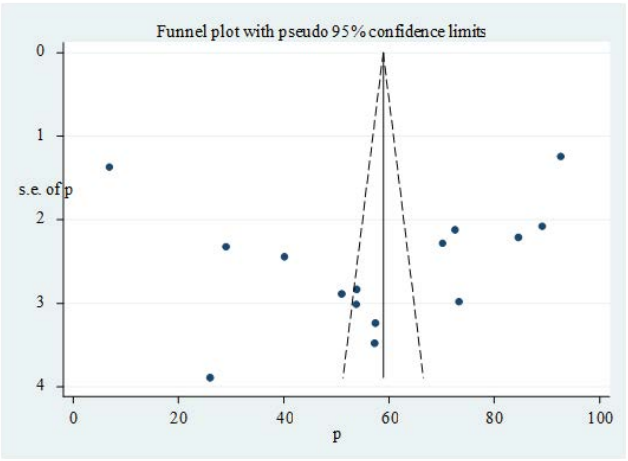

Figure 3 Funnel plot with 95% confidence limits of the pooled prevalence of partograph utilization in Ethiopia.

estimate of its omitted analysis lies within the confidence interval of the combined analysis. Therefore, trim and fill Analysis was no further computed **figure 4.**

Factors for partograph utilization in Ethiopia

In this systematic review and Meta-analysis; midwifery profession (AOR: 4.9,95%CI:3.38, 7.14), female health professionals (AOR:3.92,95%CI:2.64,4.12), having job related training (AOR:2.7,95%CI:2.26, 3.22), Knowledge about partograph (AOR:3.3,95%CI:1.5, 6.87), Training on partograph (AOR:1.28,95%CI:1.58,33.64) were determinant factors for partograph utilization in Ethiopia.

Midwifery profession and partograph utilization

Seven studies were included in this category of meta-analysis [21, 26, 27, 29, 30, 32, 33]. The pooled Meta regression analysis

showed that midwifery profession had statistically significant association with partograph utilization, OR = 4.92 (95% CI=3.38, 7.14).High heterogeneity was observed in this category of meta-analysis, I^2 = 92.7%, *P*-value ≤ 0.001; for this reason, random effect meta-analysis model was computed. Moreover, no possibility of publication bias was detected using the Egger's tests with a p-value of 0.099 **figure 5**.

Female health professionals and partograph utilization.

This review also assessed the association of female health professionals and partograph utilization. The pooled regression analysis result of four [21, 29, 30, 33]studies showed female health professionals positively associated with partograph utilization OR =3.29 (95%CI=2.64, 4.12). The heterogeneity test of studies and test for publication bias using the Egger's test showed high heterogeneity (I^2 = 82.1%, p-value ≤ 0.001) and no publication bias (p-value = 0.985) respectively (**Figure 6**).

Emergency Obstetric Care and Neonatal Care training and partograph utilization

Health professionals having short in-service EmOC and NC training was the predictors of partograph utilization. The pooled regression analysis result of studies [15, 21, 22, 24, 26, 32]showed that having Job relating training was positively associated with partograph utilization (OR= 2.7 (95%CI=2.26, 3.22) **Figure 7**.

There was high heterogeneity (I^2=99.4%; p-value ≤0.001) among the included studies. Moreover, no possibility of publication bias was detected using the Egger's tests with a p-value of (0.282).

Knowledge of partograph and partograph utilization

The pooled regression analysis result of three [22, 26, 27] studies showed that having Health professionals who have good knowledge on partograph were 3.3 times more likely to utilize partograph (OR: 3.30 (95%CI=1.59, 6.87) (Fig. 8). Moderate heterogeneity (I^2=70.4%; p-value =0.036) was detected among the included studies; for this reason, random effect meta-analysis model was computed. Moreover, no possibility of publication bias was detected using the Egger's tests with a p-value of (0.341) **figure 8**.

Training on partograph and partograph utilization

Health professionals who had Training on partograph was positively associated and significant factor for partograph

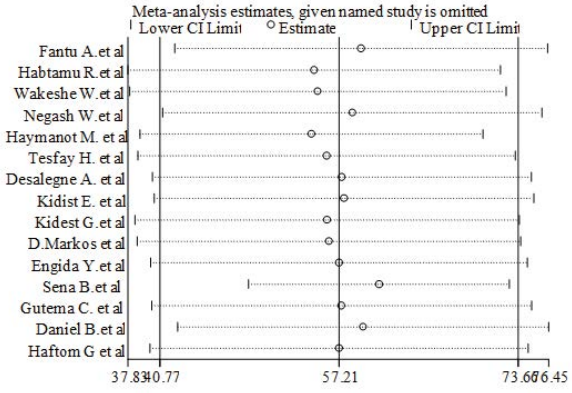

Figure 4 Sensitivity analysis of the pooled prevalence of partograph utilization in Ethiopia.

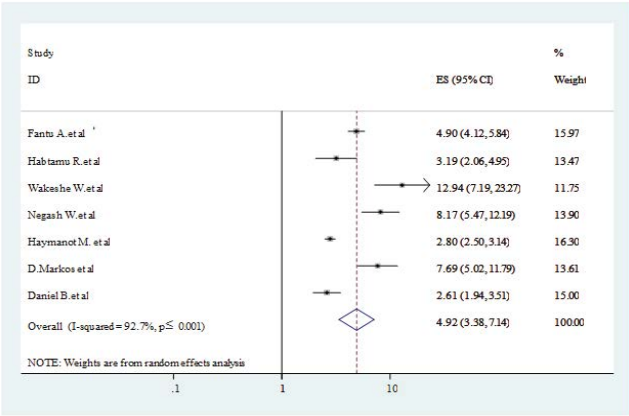

Figure 5 The pooled effects of midwifery profession on partograph utilization in Ethiopia.

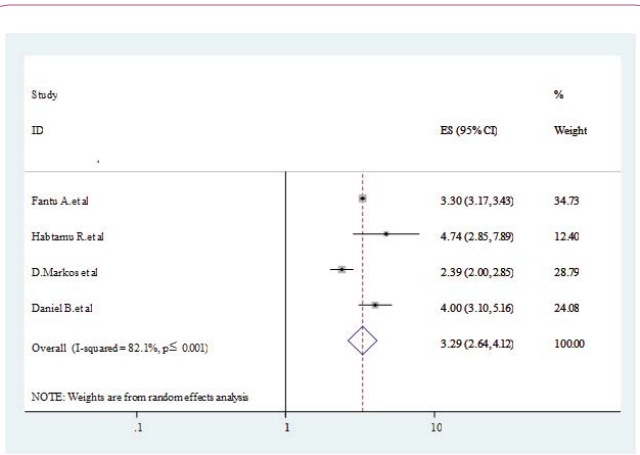

Figure 6 The pooled effects of female health professionals on partograph utilization in Ethiopia.

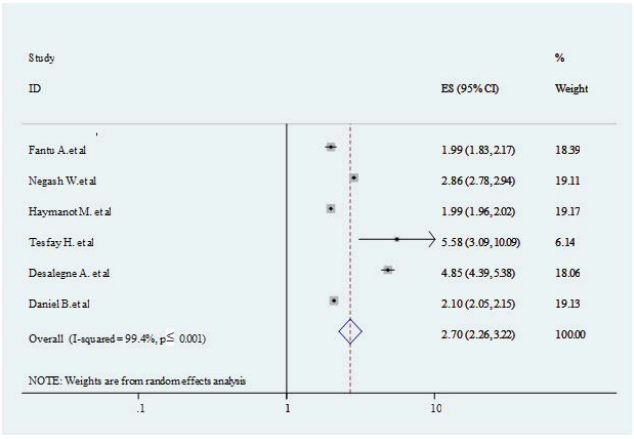

Figure 7 The pooled effects of having job relating training on partograph utilization.

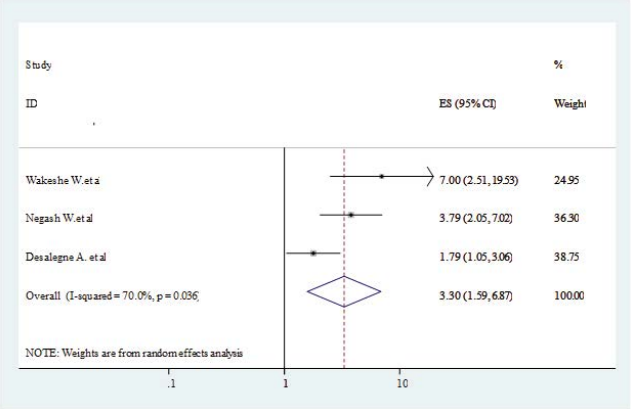

Figure 8 The pooled effects of knowledge of partograph on partograph utilization.

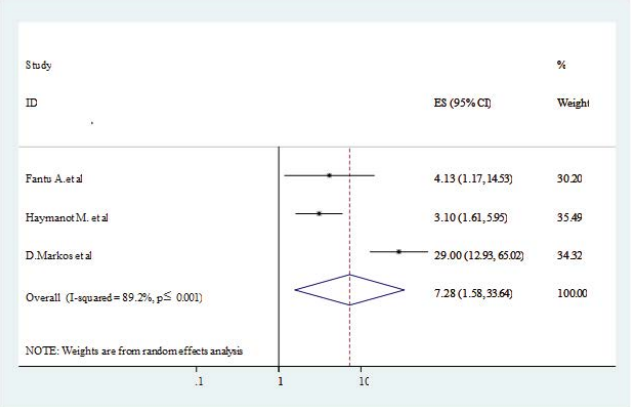

Figure 9 The pooled effects of having Training on partograph and partograph utilization in Ethiopia.

utilization (OR: 7.28 (95%CI: 1.58, 33.64) (Fig 9). High heterogeneity (I^2=89.2%; p-value ≤ 0.001) was detected among the included studies and no possibility of publication bias was detected using the Egger's tests with a p-value of (0.902).

Discussion

Partograph is a very effective tool to monitor labour and prevent prolonged and obstructed labour , the commonest cause of maternal mortality in resource-limited countries[37]. However, the utilization was not routine, not consistent everywhere and every time and even among those who used the partograph, it was not used according to the recommended standard especially in the resource-limited country [38-40]. In this study, we derived a national estimate of partograph utilization in Ethiopia. As such data are currently unavailable. Using a systematic review and meta-analysis, we derived pooled prevalence partograph utilization of 57.21 %(95%CI: 40.77, 73.66%).

Partograph utilization in our study was lower than the study report of South Africa [41], Gambia [42] and Kenya [11]. These differences might be due to differences in strategies and policies on partograph implementation, socio-economic status of the countries, and the difference in study design, sample size and time gap since, as time elapses, there is a change in strategy, policy, and improvement in the implementation of the partograph.

The second reason might be explained as health care providers might have different levels of knowledge towards partograph, availability of training and number of health professionals distributed to health facility, one factor for utilization was a shortage of staff and work overload.

In the studies of Gambia and South Africa; the participants were only midwives by profession with a great chance to work in labour and delivery unit, to be trained on partograph and might have better knowledge, skill, and commitment to using partograph. But In our study, relatively verities of health professions have participated.

The finding of this study was higher than the studies conducted in Cameroon [43], Uganda [44], Analamanga [45] and Benin [39]. The possible explanation might be the Ethiopian government first in Africa to make a strong commitment to the United Nation's inspired Millennium Development Goals (MDGs) by making maternal health as of priority health program. Efforts of the Federal ministry of health + Partners (multi-pronged approach) were applied and there were service coverage and utilization improvements. Additionally, the difference might be due to the difference in study design, sample size.

This systematic review and meta-analysis showed that the existence of a significant association between midwifery profession (AOR: 4.9,95%CI:3.38, 7.4) and partograph utilization.

This study finding is supported by the study conducted in Nigeria [38] and South Africa [41]. This might be due to the fact that midwives might be frequently assigned in labour, delivery unit and might use the partograph daily. The other reason might be Midwives might have a better chance of getting partograph training and in-service obstetric training; they might have a better understanding of partograph than other health professionals. Additionally, midwives might have better knowledge and commitment since obstetric care is a major subject in pre-service education.

In this systematic review and meta-analysis, female health professionals were utilized partograph than male health professionals more (AOR: 3.92, 95%CI: 2.64, 4.12). This study finding is supported by the study conducted in India [46]. This might be due to the fact that female is closer to obstetric information or maybe because female professionals were more committed and optimistic than males to complete the components of partograph.

health professionals having short in-service Emergency Obstetric Care and Newborn care training were 2.7 times more likely to utilize partograph than their counterparts (AOR:2.7,95%CI:2.26, 3.22. This study finding is supported by the study done in Malawi [47] and Nigeria [38]. This might be due to the fact that the training improves the status of existing health professionals' knowledge on partograph, intern improves utilization of partograph.

The other reason might be as having Emergency Obstetric Care and Newborn care training was able to interpret components of

the partograph and increase confidence and motivation to use partograph than those who did not have training. Additionally, the training may support improve the status of existing knowledge and point out those obstetric caregivers should get periodic on-job refresher pieces of training on the obstetric care.

On-job training on partograph had a significant association with partograph utilization. Obstetric care providers who received on the job training on partograph were about 3 times more likely to utilize partograph than those who had not received on-job training. This might be due to the fact that, obstetric care providers who received on-job training had better knowledge about partograph than others13,14,19; that in turn improves their partograph utilization.

Knowledge of the partograph was other significant factors for its utilization and health professional having good knowledge of partograph were 3.3 times (AOR: 3.3, 95%CI: 1.5, 6.87), use partograph. This might be due to the fact that having good knowledge of partograph might enhance caregivers' skill and competency to use it as a decision making tool and interpret it. This was supported by other studies [48,49].

Conclusion

To design more adaptable policies and strategies on partograph utilization to the local context, National estimate and its associated factors need to be generated. Given the importance of such data, there is no published systematic review and meta-analysis on utilization of partograph and associated factors in Ethiopia. As a result, the authors believe that, this systematic review and meta-analysis will generate concrete evidence on the national level of utilization and the result will provide substantial evidence for the government and other stakeholders working on maternal and child health and it will help them in designing intervention and to have strategies on improving the utilization at the national level.

The overall pooled prevalence of Partograph utilization was found to be low. Midwifery profession, female health professionals, having short in-service EmOC and NC training, having Knowledge about partograph, Training on partograph were determinant factors for partograph utilization in Ethiopia.

References

1. Kushwah B (2013) The partograph: an essential yet underutilized tool. J Evol Med Dent Sci, 2: 4373-4379.
2. Kenchaveeriah SM, Patil kp, Singh TG (2011) Comparison of two WHO partographs: a one year randomized controlled trial. J Turk Ger Gynecol Assoc, 12: 31-34.
3. Kushwah B, Shipra Singh (2013) The Partograph: An Essential Yet Underutilized Tool. Evolution of Medical and Dental Sciences 12: 4373-4379.
4. WHO (1994) The application of the WHO partograph in the management of labor. Report of a WHO multicenter study 1990-1991. WHO Maternal Health and Safe Motherhood Programme.
5. WHO, UNFPA, World Bank Group and the United Nations Population Division, Trends in Maternal Mortality: (1990 – 2015) Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division? United Nations.
6. Lancet (2015) Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: a systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group.
7. Central Statistical Agency - CSA/Ethiopia and ICF, Ethiopia Demographic and Health Survey (2016). 2017, CSA and ICF: Addis Ababa, Ethiopia.
8. Assefa Y (2017) Successes and challenges of the millennium development goals in Ethiopia: lessons for the sustainable development goals. BMJ Global Health, 2: 000318.
9. Rahnama PS, Ziaei, Faghihzadeh S, (2006) Impact of early admission in labor on method of delivery. International Journal of Gynecology & Obstetrics, 92:217-220.
10. Tayade, S, Jadhao P (2012) The impact of use of modified WHO partograph on maternal and perinatal outcome. International Journal of Biomedical and Advance Research, 3:256-262.
11. Lancet (2010) Rapid assessment of partograph utilization in selected maternity units in Kenya. East Afr Med J, 87: 235-241.
12. Yisma (2013) Knowledge and utilization of partograph among obstetric care givers in public health institutions of Addis Ababa, Ethiopia. BMC pregnancy and childbirth, 13**:** 17.
13. Zelellw DA, Tegegne TK (2018) Level of partograph utilization and its associated factors among obstetric caregivers at public health facilities in East Gojam Zone, Northwest Ethiopia. PloS one, **13**: 479-479.
14. Wakgari, N (2015) Partograph utilization and associated factors among obstetric care providers in North Shoa Zone, Central Ethiopia: a cross sectional study. Afr Health Sci, 15: 552-559.
15. Hailu T (2018) Assessment of partograph utilization and associated factors among obstetric care givers at public health institutions in central zone, Tigray, Ethiopia. BMC Research Notes, 11:710.
16. Hinkosa L (2018) Assessment of partograph utilization and associated factors among obstetric care givers at public health institutions in central zone, Tigray, Ethiopia.
17. Markos D, Bogale B (2015) Documentation status of the modified World Health Organization partograph in public health institutions of Bale zone, Ethiopia. Reprod Health 12: 81.
18. Kitila SB, Molla A, Nemera G (2014) Utilization of Partograph during Labour and Birth Outcomes at Jimma University. Preg Child Health.
19. Mezmur H, Semahegn A, Tegegne (2017) Health professional's knowledge and use of the partograph in public health institutions in eastern Ethiopia: A cross-sectional study. BMC Pregnancy and Childbirth, 17.
20. Shamseer L (2015) Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. Bmj, 349:7647-7649.
21. Abebe F (2013) Assessment of knowledge and utilization of the partograph among health professionals in Amhara region, Ethiopia. Science journal of clinical medicine, 2:1-17.
22. Zelellw DA, Tegegne TK, Getie GA (2016) Knowledge and attitude of obstetric care providers on partograph and its associated factors in East Gojjam Zone, Northwest Ethiopia. Advances in medicine.
23. Yisma E (2013) Completion of the modified World Health Organization (WHO) partograph during labour in public health institutions of Addis Ababa, Ethiopia. Reproductive health, 10**:** 23.

24. Mezmur H, Semahegn A, Tegegne B (2017) Health professional's knowledge and use of the partograph in public health institutions in eastern Ethiopia: a cross-sectional study. BMC Pregnancy and Childbirth, 17**:** 291.

25. Getu K, Eyasu T (2019) Knowledge of partograph utilization and its associated factors: A cross-sectional survey in Wolaita Zone Southern Ethiopia. International Journal of Nursing and Midwifery,11 1-6.

26. Wakgari N (2015) Partograph utilization and associated factors among obstetric care providers in North Shoa Zone, Central Ethiopia: a cross sectional study. African health sciences, 15: 552-559.

27. Wakeshe W (2015) Magnitude of partograph use and factors that affecting its utilization among obstetric caregivers in public health institutions of West Showa Zone, Oromia Regional state, Ethiopia.

28. Kidist Eshetu, Dubale Dulla EH (2017) Magnitude of Partograph Use and Associated Factors among Obstetric Care Givers in Public Health Institution in Sidama Zone, Southern Ethiopia. Diversity and Equality in Health and Care, 14: 316-323.

29. Habtamu Regasa, Hasen Adem TT (2018) Utilization of partograph and associated factors among obstetric care givers in hospitals of Western Oromia, Ethiopia. Panacea Journal of Medical Sciences.

30. Markos D,Bogale B (2015) Documentation status of the modified World Health Organization partograph in public health institutions of Bale zone, Ethiopia. Reproductive Health, 12: 81.

31. Kitila S (2014) Utilization of Partograph during Labour and Birth Outcomes at Jimma University. Journal of Pregnancy and Child Health, 1.

32. Gutema C, Kassa D (2019) Partograph Utilization and Factors Associated with Poor Perinatal Outcomes in Wolaita Sodo University Referral Hospital,Southern Ethiopia Journal of Health, Medicine and Nursing 63.

33. Guesh WG, Natneal EA, Berhanu G, Senait G, Betell B, et.al. (2019) Utilization of the partograph and its associated factors among obstetric care providers in the Eastern zone of Tigray, Northern Ethiopia. The Pan African Medical Journal.

34. Joanna Briggs Institute (2017) Reviewers' Manual, Edition 2014.

35. The Joanna Briggs Institute (2017) Critical Appraisal Tools for Use in JBI Systematic Reviews Checklist. The Joanna Briggs Institute North Adelaide, Australia.

36. Higgins (2003) Measuring inconsistency in meta-analyses. Bmj, **327:** 557-560.

37. Allauddin Md, Arunangsu De, Parthajit Mandal, Mayoukh Chakraborty (2008) Monitoring labour with WHO Modified Partograph;A study report? NJOG 3.

38. Opiah, (2012) Knowledge and Utilization of the Partograph among Midwives in the Niger Delta Region of Nigeria. African Journal of Reproductive Health / La Revue Africaine de la Santé Reproductive, 16:125-132.

39. Azandegbe, Testa, Makoutode M (2004) Assessment of partogram utilisation in Benin. Sante (Montrouge, France), 14**:** 251-255.

40. Unicef (2015) WHO A trends in maternal mortality: 1990–2015: estimates from WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division.

41. Mathibe-Neke, Lebeko, Motupa B (2013) *The partograph: A labour management tool or a midwifery record?* International Journal of Nursing and Midwifery, **5:** 145-153.

42. Badjie B (2013) Partograph use among Midwives in the Gambia. African Journal of Midwifery and Women's Health, 7: 65-69.

43. Nyiawung FN, Fondungallah JA, Egbe TO (2018) The Partogram: Knowledge, Attitude and Use by Healthcare Providers at Two Hospitals in the South West Region of Cameroon. 4(2). Arch Community Med Public Health, 4:073-077.

44. Mukisa J (2019) Level of Partograph completion and healthcare workers' perspectives on its use in Mulago National Referral and teaching hospital, Kampala, Uganda. BMC Health Serv Res,19: 107.

45. Rakotonirina (2013) Assessment of the use of partographs in the region of Analamanga. International Journal of Reproduction, Contraception, Obstetrics and Gynecology, 2:257.

46. Palo SK, Singh S, Priyadarshini S, Pati S (2019) Intrapartum monitoring using partograph at secondary level public health facilities -A cross-sectional study in Odisha, India. Family Med Prim Care 8: 2685-2690

47. Institute of Health and Society (2012) Use and documentation of partograph in urban hospitals in Lilongwe Malawi health workers' perspective. University of Oslo, Faculty of Medicine.

48. Ernest Okechukwu ORJ, MAKINDE Niyi O, ADEYEMI Babalola A, ONWUDIEGWU U (2008) Impact of Training on the Use of Partograph on Maternal and Perinatal Outcome in Peripheral Health Centres. . Turkish-German Gynecol Assoc, 8.

49. Fawole AO, Adekanle DA (2008). Knowledge and utilization of the partograph among obstetric care givers in south west Nigeria. African Journal of Reproductive Health,12**:** 22-29.