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Partograph adherence trends in various healthcare services: A Systematic Review

Tendencias de adherencia al partograma en diversos servicios de salud: una revisión sistemática

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SUMMARY

A partograph is a tool used to monitor the progress of labor and identify potential complications. However, evidence shows that many countries still need to improve partograph adherence. This study aims to review the adherence to using partographs in health services. Literature is identified through PubMed, Scopus, and Google Scholar with the keywords "Partograph," "Adherence," AND "Health Care." In total, 12 studies were identified and analyzed. The results showed that partograph adherence in developing countries ranged from 20 % to 80 %. Factors associated with low adherence include a lack of training and knowledge of partographs among healthcare workers, lack of resources, and traditional childbirth culture. Compliance with partographs still needs to improve in health services. Factors influencing compliance include staff shortages, heavy workloads, lack of training, and inadequate monitoring. Recommendations to improve compliance include on-the-job training, routine monitoring, and supportive supervision. Proper partograph use in improving maternal and neonatal outcomes is emphasized. The findings of this systematic review can be used to inform policies and programs aimed at improving compliance with the use of partographs in developing countries. Further research is needed to identify effective interventions to improve compliance in various contexts.

Keywords: *Partograph, adherence, health care.*

RESUMEN

Un partograma es una herramienta que se utiliza para monitorear el progreso del trabajo de parto e identificar posibles complicaciones. Sin embargo, la evidencia muestra que muchos países aún necesitan mejorar la adherencia al partograma. Este estudio tiene como

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objetivo revisar la adherencia al uso de partogramas en los servicios de salud. La literatura se identifica a través de PubMed, Scopus y Google Scholar con las palabras clave "Partógrafo", "Adherencia" Y "Atención médica". Se identificaron y analizaron un total de 12 estudios. Los resultados mostraron que la adherencia al partograma en los países en desarrollo osciló entre el 20 % y el 80 %. Los factores asociados a la baja adherencia incluyen la falta de formación y conocimiento de los partogramas entre los trabajadores sanitarios, la falta de recursos y la cultura tradicional del parto. El cumplimiento de los partogramas aún debe mejorar en los servicios de salud. Los factores que influyen en el cumplimiento incluyen la escasez de personal, la gran carga de trabajo, la falta de capacitación y el monitoreo inadecuado. Las recomendaciones para mejorar el cumplimiento incluyen capacitación en el trabajo, monitoreo de rutina y supervisión de apoyo. Se hace hincapié en el uso adecuado del partograma para mejorar los resultados maternos y neonatales. Los hallazgos de esta revisión sistemática se pueden utilizar para informar las políticas y programas destinados a mejorar el cumplimiento del uso de partogramas en los países en desarrollo. Es necesario realizar más investigaciones para identificar intervenciones eficaces que mejoren el cumplimiento en diversos contextos.

Palabras clave: *Partigrama, adherencia, cuidado de la salud.*

INTRODUCTION

The death of mothers and babies is still a problem that needs to be considered in the world. Based on World Health Organization (WHO) data, every day in 2020, nearly 800 women died from preventable causes related to pregnancy and childbirth. Maternal deaths occurred almost every two minutes in 2020. The high burden of direct obstetric causes (such as postpartum hemorrhage, pre-eclampsia and hypertensive disorders, pregnancy-related infections, and complications of unsafe abortion) and indirect causes (infectious and non-communicable diseases) are proximate causes in many low-resource settings. Other factors that contribute to maternal mortality include 1. health system shortcomings, which result in (i) patients waiting longer to seek care or receiving it after arriving at a facility; (ii) subpar care; (iii) shortages of necessary medical supplies; and (iv) a lack of accountability in health systems; 2. social determinants, such as income, educational attainment, race, and ethnicity, which place specific populations at higher risk; 3. detrimental gender norms, biases, and inequalities that lead to a low priority of women and girls' rights, including their right to safe and quality care (1). Between 2000 and 2020, the maternal mortality ratio (MMR), the number of maternal deaths per 100 000 live births, fell by about 34 % worldwide. Nearly 95 % of all maternal deaths occurred in low- and lower-middle-income countries in 2020. Care by health professionals before, during, and after childbirth can save the lives of mothers and newborns (1). One of the efforts that can be made to reduce maternal and infant mortality during childbirth is monitoring using a partograph (2).

A partograph, a simple but vital tool, is crucial in reducing maternal and infant mortality. Various studies have shown a positive relationship between using partographs and decreasing maternal and infant mortality rates. A study in Indonesia found that consistent use of partographs was associated with a 60 % decrease in maternal mortality and a 52 % decrease in infant mortality. Another study in Tanzania showed that correctly using a partograph can reduce the risk of maternal mortality by up to 28 % (3,4). According to the World Health Organization, only 50 % of deliveries worldwide use a partograph. This causes concern because the partograph is a vital tool that can help reduce maternal and infant mortality rates. A factor that causes the low use of partographs is poor adherence to the use of partographs during labor (5). The problem of non-compliance in using partographs is a critical issue in maternal health services and can affect the quality of care and health outcomes of mothers and babies.

Several studies have been conducted in different countries to provide evidence regarding utilization and challenges associated with adherence to partographs. However, further research on interventions can improve the training and motivation of health workers, especially in areas with limited resources. The analysis found an inadequate gap in monitoring the workforce's progress due to documentation problems (6). Professional adherence to the use of partograms is

not sufficient for obstetric care (7). The findings of this study reveal that most healthcare providers still need to increase the use of partographs. The factors influencing compliance in using partographs included the location of the health facility, the level of Emergency Obstetric and Newborn Care (EmONC), the experience of the service provider, the type of facility, the managing authority, and the level of education of the service provider. In addition, factors such as knowledge, availability of partographs, staff shortages, level of facilities, qualifications, professional differences, managerial support, staff motivation, training, and experience of healthcare providers were also identified as factors associated with the use of partographs (8). This systematic review aims to address these gaps by critically analyzing existing research and identifying strategies that have proven effective in various contexts. Thus, this study can provide stronger, evidence-based recommendations to improve adherence to using partographs in health services, which is ultimately expected to reduce maternal and infant mortality rates.

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METHOD

This systematic review follows the guidelines of the Statement of Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) (6). This systematic review was conducted to answer specific, relevant, and focused questions and assess WHO policies related to monitoring during childbirth using a partograph that health workers could use.

The inclusion criteria of this systematic review are articles written only in English, discussing aspects of compliance with the use of partographs in health services, and written between 1 January 2015 and 31 December 2023. This systematic review's eligibility criteria are PICOS (Population, Intervention, Comparators, Outcomes, and Study Design). Where the population in this systematic review is health workers (doctors, midwives, nurses, and other health workers) who carry out childbirth monitoring. The intervention of this study is the use of partographs; in this study, there are comparators, namely not using partographs, and the outcome of this systematic review is compliance in the use of partographs, with the study design used being quantitative and qualitative.

Article searches were performed by browsing PubMed, ScienceDirect, and Google Scholar databases. This search was complemented by manual searches on Google's search engine and Research Gate's online repository for other articles that met the selection criteria. The literature search used the keywords "Partograph," "Adherence," and "Health Care" to ensure a comprehensive search.

After collecting the results of article identification through electronic search, the data-based articles were exported to a Microsoft Excel spreadsheet. Three authors independently extracted data and reviewed the filtered and qualified articles with PICOS eligibility criteria. Any reviewer disagreement was carried out by consensus between the three authors through discussion, considering that scores are still above 50 %. The methodological quality of each study (sampling strategy, response rate, and representativeness of the study), comparability, and results are examined using the Joanna Briggs Institute (JBI) critical appraisal tool, which assists in assessing the trustworthiness, relevance, and results of published papers, and allows to evaluate the methodological quality of a study and to determine the extent to which a study has addressed possible bias in its design and analysis. All articles with a JBI score of 50 % or more were considered "good" studies with low risk.

RESULTS

The comprehensive literature search meticulously filtered 479 articles using the specified keywords. These articles were then meticulously identified based on the PICOS, resulting in a substantial pool of 382 articles for the article screening process. At the article screening stage, 174 articles were deemed suitable based on their abstracts. A meticulous feasibility selection was then carried out, considering the essence and scope of the discussion in each article. This thorough process led to the selection of 12 articles for inclusion and the exclusion of one article (Figure 1).

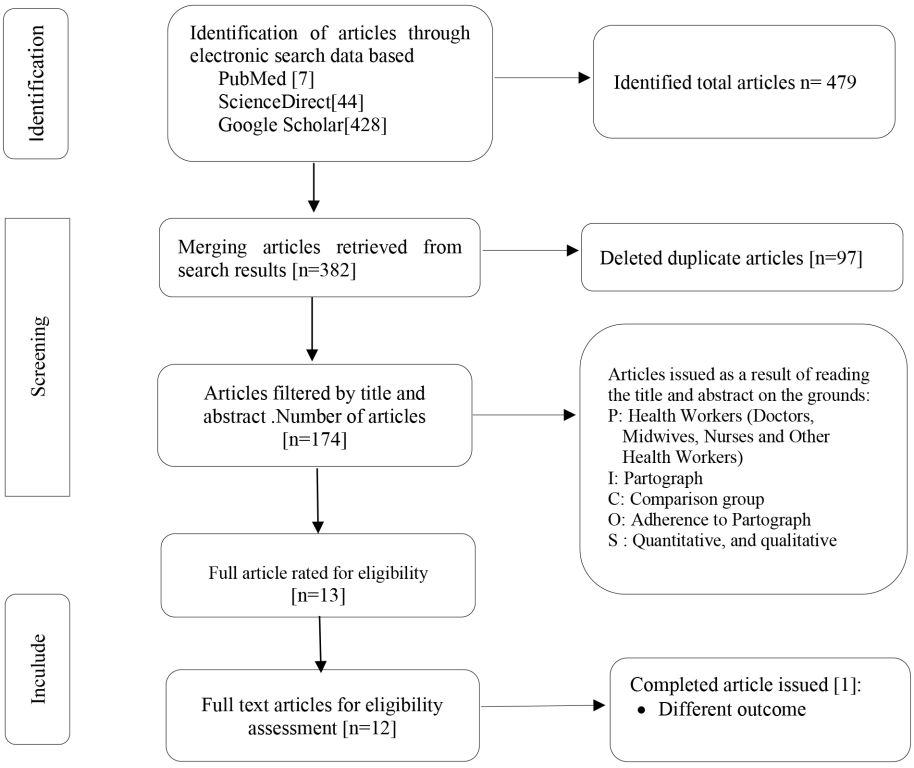

Figure 1. Steps for selecting articles are illustrated in the PRISMA flowchart.

The characteristics of the study analyzed in this systematic review included a wide range of health facilities in six countries: India, Ethiopia, Kenya, Tanzania, the United States of America, and Malawi. The health facilities studied include the public and private sectors. Most study participants were doctors, nurses, midwives, and other health workers. These studies had varying sample sizes, with a minimum of seven participants and a maximum of 7 248 individuals observed through healthcare workers and the number of deliveries (Table 1).

Twelve articles assessed healthcare providers' compliance regarding the use of partographs. It is observed from Table 2 that factors influencing compliance in using a partograph include labor shortage and heavy workload (5), the complexity of the partograph chart (8,9), knowledge and skills gap among healthcare providers on how to use a partograph (7), limited knowledge about the importance of a partograph tool (7), location of health facilities, EmONC (Emergency Obstetric and Newborn Care) levels, healthcare provider experience (8), healthcare provider education level (10), staff competency in using photographs, practice environment, and organizational culture (11), lack of guidance at the healthcare facility level (14), limited availability of partographs in healthcare facilities (14), managerial support, staff motivation, training, and experience of healthcare providers (10,11,13,15,16).

DISCUSION

Of the 12 articles assessed, it was stated that the use of partographs was still low regarding influencing individual, organizational, and system factors. However, the research conducted in India revealed a potential for significant improvement in using partographs in labor monitoring. At the

Table 1. Characteristics of the study

Author	Article Title	Research Venue	Year	Study Participants	Methods	Sample Size
Devina Bajpayee et al.(5)	Strengthening the Use of Partograph in High Caseload Public Health Facilities in India through an Integrated Quality Improvement Approach	India	2020	Nurse	Integrated quality improvement approach to enhance partograph usage	194
Solomon Weldemariam Gebrehiwot et al. (7)	Health care professionals' adherence partograph use in Ethiopia: analysis of 2016 national emergency obstetric and newborn care survey	Ethiopia	2020	Midwives, nurses, and health workers	Quantitative with logistic regression	2 610
Nirmalya Manna et al. (8)	Partograph Adherence and its Barriers in a Tertiary Care Hospital: A Mixed-Method Study	India	2022	Nurse	Cross-sectional study comprises quantitative and qualitative methods	131
Subrata Kumar Palo et al. (9)	Intrapartum monitoring using partograph at secondary level public health facilities—A cross-sectional study in Odisha, India	India	2019	Nurse, doctor	A cross-sectional study with quantitative and qualitative data	1 552 Maternity
Doris Kibiwott et al. (10)	Partograph use among skilled birth attendants in selected counties in Western Kenya	Kenya	2021	Nurse	Cross-sectional study with multivariable logistic regression	149
Dedius E. Peter et al. (11)	Levels of Practices and Influencing Factors on the Use of Partograph on Provision of Health Care among Nurses in Singida Municipality	Tanzania	2022	Nurse	Analytical cross-sectional study with multinomial logistic regression	150
Polite Dube et al. (12)	Impact of Performance-Based Financing (PBF) Program on Utilization and Completeness of Partographs in Jimma	Ethiopia	2022	Obstetric health workers	A quasi-experimental design with a control zone for comparison	7 248 maternity mothers
Tâmara Silva de Lucena et al. (13)	Analysis of partogram completion as good obstetric practâice in the monitoring of labor	Vale do São Francisco	2019	Nurse Doctor	Retrospective and transversal study with a quantitative approach	191 medical records
Sarika Chaturvedi et al. (14)	Implementation of the partograph in India's JSY cash transfer program for facility births: a mixed methods study in Madhya Pradesh province	India	2015	Nurses, midwives	A mixed methods study using Carroll's framework for implementation fidelity	233
Chrispin Mandiwa et al. (15)	Documentation of the partograph in assessing the progress of labor by healthcare providers in Malawi's South-West zone	South-West Malawi	2017	Midwife, clinician	A descriptive study involving retrospective review	1 070 partographs
Ritu Singh et al. (16)	Modified WHO Partograph in Labour Room: A Quality Improvement Initiative to Find Out Concerns, Challenges, and Solutions	East India	2022	Nurse Doctor	Quasi-experimental study with mixed methods design	7
Polite Dube et al. (17)	Factors Associated with Partograph Utilization in Jimma and Bedele Zones, Oromia Regional State, Ethiopia	Ethiopia	2022	Healthcare workers	Cross-sectional with control site for comparison using logistic regression	239

Table 2. Partograph Adherence Trends in Various Healthcare Services

Author	Partograph Adherence	Factors Influencing Categories	Result
Devina Bajpayee et al. (5)	1. Tool Complexity 2. Limited Competence of Service Providers 3. Limitations of Organizational Commitment 4. Lack of Guidance at the Facility Level 5. Limited Availability. 6. Distance to Birth Center and Difficulties in Referral 7. High Burden of Childbirth Cases	- Individual - Organizational	This study highlights the importance of implementing evidence-based practices to improve maternal and newborn health outcomes.
Solomon Weldemariam Gebrehiwot et al. (7)	1. Service providers 2. Type of facility 3. Managing Authority 4. The level of education of the service provider. 5. Knowledge 6. Availability of partographs 7. Staff shortages 8. Facility level 9. Qualification 10. Professional differences 11. Managerial support 12. Staff motivation 13. Training, and 14. Healthcare provider experience.	- Individual - Organizational - System	The results of this study show that compliance with the use of partographs in Ethiopia is low, with the recording of parameters such as molding, maternal temperature, and degradation being the least recorded. This indicates the poor quality of intrapartum care in health facilities, which may be partly the reason for the high maternal and perinatal morbidity and mortality in Ethiopia. In addition, this study also found that health facilities located in rural areas are more compliant with the use of partographs compared to facilities in urban areas.
Nirmalya Manna et al. (8)	1. Labor Shortage and Heavy Workload 2. Presentation in the Advanced Stage of Childbirth: 3. Lack of Training and Supervision: 4. Lack of Knowledge and Skills: 5. Institutional Policies: 6. Motivation and Commitment: 7. Incomplete Clinical Documentation by Physicians.	- Individual - Organizational - System	The study found that only 61.07% of deliveries had partograph plotting, and only 5.00 % were completed.
Subrata Kumar Palo et al. (9)	1. Shortage of health workers 2. Increased workload 3. Inadequate training 4. Lack of monitoring and supervision 5. Unavailability of partograph records 6. Lack of interest in filling the partograph 7. Staff personality issues	- Organizational - System	The results showed that the use and completeness of partographs in public health facilities in Odisha, India, was still low. The partograph was plotted in 48.7 % of deliveries, but the completeness was only 1.03 %. Factors such as shortage of healthcare workers, inadequate training, increased workload, and lack of monitoring contribute to low compliance. Recommendations to improve compliance and completeness include on-the-job training, regular monitoring, and supportive supervision.
Doris Kibiwott et al. (10)	1. Gender 2. Knowledge of Partograph. 3. Age 4. Profession	- Individual - Organizational	The study highlights the need for better workplace training for nurse-midwives on using partographs and the possible use of electronic partographs to improve

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Author	Partograph Adherence	Factors Influencing Categories	Result
	6. Work Experience 7. BEmONC Training		
Dedius E. Peter et al. (11)	1. Education Level 2. Professional Qualifications 3. Age These factors suggest that education and professional qualifications are the main elements influencing the use of partographs during the delivery of healthcare	- Individual	The results showed that the practice level of partograph use in Singida Municipality, Tanzania, was low. Only 38.7% of nurses have a high level of practice in using partographs. Factors such as education level and professional qualifications were found to affect the level of practice. Nurses with higher education and professional qualifications tend to have better practice. The study recommends on-the-job training and workshops to improve the use of partographs and reduce maternal complications and mortality.
Polite Dube et al. (12)	1. Training and Mentoring: 2. Financial Incentives: 3. Institutional Supervision and Policy	- Organizational - System	This study highlights the importance of quality maternity care and the role of PBF in improving health service outcomes for pregnant women. However, studies in different countries showed mixed results, with some positively impacting the quality of care and health outcomes. In contrast, others highlighted the unintended consequences and challenges faced.
Tâmara Silva de Lucena et al. (13)	1. Lack of Professional Knowledge 2. Low Adoption in Maternity Hospitals 3. Interventional Obstetric Care Model 4. Lack of Continuous Evaluation 5. Inconsistencies in Item Filling	- Individual - System	Based on the information provided, the results of the study show that: 1. Only 40.6% of the partograms were filled during hospitalization at a Vale do São Francisco maternity school. 2. Most partograms include the identification of parturient but lack information about parity and gestational age. 3. Cervical dilation is noted correctly in 99.5% of cases, but other items, such as presentation height and warning lines, are filled in smaller proportions. 4. Most of the partograms are opened at the right time, but only 4.7% include a variety of positions. 5. There is inconsistency in recording cervical dilatation and presentation height.
Sarika Chaturvedi et al. (14)	1. Uses of Partograph 2. Staff Competencies 3. Practice Environment 4. Training and Supervision	- Individual - System	This study highlights the importance of proper partogram filling to ensure safe and effective obstetric care. Overall,

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…continuation Table 2. Partograph Adherence Trends in Various Healthcare Services

Author	Partograph Adherence	Factors Influencing Categories	Result
	5. Participant Responsiveness		highlights the need for improvements in training, supervision, and the work environment to improve the use of partographs and the quality of care in JSY programs.
Chrispin Mandiwa et al. (15)	1. Shortage of health workers 2. Complexity of a partograph chart 3. Knowledge and skills gaps among healthcare providers on how to use partographs 4. Limited knowledge of the importance of the partograph tool.	- Individual - Organizational	The study also found poor documentation of vital parameters in the partograph, indicating inadequate labor monitoring by healthcare providers.
Ritu Singh et al. (16)	1. Availability or supply of partographs 2. Time 3. Staff shortages 4. Limited knowledge and understanding 5. Lack of training 6. Confusion about roles and responsibilities	- Individual - System	Based on the information provided, the results of this study show that the quality improvement initiative successfully increased the use of modified partographs from WHO in the delivery room from 25% to 92% within six months
Polite Dube et al. (17)	1. Knowledge of the partograph 2. Availability of partographs 3. Training on partographs 4. Professional qualifications (Midwife, Nurse, Public Health Officer, Doctor) 5. Exposure to Performance-Based Financing (PBF)	- Individual - System	This study emphasizes the importance of continuous training and mentorship to ensure health workers consistently use partographs.

beginning of the study, the use of partographs was still low, with significant variation between states. For example, in Delhi, only 0.1 % of deliveries use a partograph, while in Haryana, the practice is more established, with almost 80 % of deliveries monitored using the device. In addition, it was found that, at baseline, the percentage of completed partographs in all aspects was very low (overall 32 % of the 949 samples) with variation between states, such as only 10 % of the completed partographs in Delhi and 49 % in Haryana. It was also found that the print format of the partograph was not available in 30 % of the facilities, and the maternity ward staff found it difficult to plot the partograph for each woman. However, at the end of the study period, there was a significant increase in the filling of complete partographs; for example, in Delhi, it increased to 59 % (5). In line with research conducted in Ethiopia, compliance with the use of partographs is low, with the recording of parameters such as molding, maternal temperature, and degradation being the least recorded. This indicates the poor quality of intrapartum care in health facilities, which may be partly the reason for the high maternal and perinatal morbidity and mortality in Ethiopia. In addition, this study also found that health facilities located in rural areas are more compliant with the use of partographs compared to facilities in urban areas.

Significant improvement was found in the use and completeness of the partograph, with an increase in the service provider's competence. Proper utilization of the partograph is crucial for early identification of complications during labor, which can help in timely intervention to prevent maternal and perinatal morbidity and mortality. Clinical leadership involvement is

critical to promoting the correct and regular use of the partograph. This study emphasizes the importance of a tailored implementation approach and the need for ongoing support and guidance to increase the use of critical tools in healthcare settings. In addition, the results showed an improvement in the practice of using partographs and an increase in the competence of staff in filling them (5). According to Dube (12), the issue of compliance with the use of partographs in this study includes several main factors, including lack of knowledge and training. Lack of knowledge about partographs and lack of training on their use are significant reasons affecting compliance. The availability of partographs in health facilities is also an important factor. When partographs are not available, healthcare workers cannot use them. Regarding workload and supervision, high workload and lack of oversight are also the main reasons why partographs are not used routinely. With regard to institutional policies and procedures, the absence of policies requiring the use of partographs in some healthcare facilities also affects compliance levels. Performance-Based Financing (PBF) improves compliance with partographs (12). In line with Dube et al., it is shown that the PBF program significantly impacts the increase in the use and completeness of the partograph in the Jimma zone compared to Buno-Bedelle in Ethiopia. This increase is attributed to the training, mentoring, and financial incentives provided through the PBF program (12,17). Adequate training coupled with the availability of partographs can mitigate the impact of high workload on compliance. However, achieving optimal compliance may be challenging without addressing all these factors collectively.

Various strategies are implemented to improve compliance with partographs, such as training for residents, engaging interns and nurses, creating written policies, and attaching partographs to patient files. The use of partographs has increased gradually through several Plan-Do-Study-Act cycles, demonstrating the effectiveness of quality improvement approaches in addressing problems and challenges in labor monitoring. Solutions such as training to identify common barriers to using partographs, policy implementation, and division of responsibilities should be implemented. Similar studies in Uganda and India have also shown success with similar interventions. This study highlights the importance of regular audits to maintain results and the need for more extensive studies to confirm the effectiveness of quality improvement methodologies in improving the use of partographs (16,18). In one of the articles, better documentation of vital parameters in the partograph indicated adequate healthcare providers' childbirth monitoring. Reasons for poor documentation could include a shortage of healthcare workers, the complexity of the charts, knowledge and skills gaps among providers, and a limited understanding of the importance of the tool. Recommendations include in-service training on the use of partographs, ongoing supportive supervision, and monitoring of the use of partographs. Further research is needed to understand the reasons for non-compliance and provide evidence-based recommendations (15).

CONCLUSION

The research highlights the low compliance in using partographs during childbirth in healthcare facilities in countries like India and Ethiopia. It underscores the crucial role of healthcare professionals, policymakers, and researchers in addressing this issue. Factors influencing compliance include staff shortages, heavy workloads, lack of training, and inadequate monitoring. Recommendations to improve compliance include on-the-job training, routine monitoring, and supportive supervision. The importance of healthcare providers' role in implementing these recommendations is emphasized. Proper partograph use in improving maternal and neonatal outcomes is also highlighted. Challenges in implementing partograph use during childbirth, such as staff shortages, time constraints, and inadequate training, are also discussed. Recommendations include better training, supportive supervision, and conducive work environments. Factors affecting compliance with partograph use must be addressed to achieve positive health outcomes. The significance of regular audits and continuous training to enhance partograph use by healthcare providers is highlighted. The research also indicates that partograph use in monitoring childbirth remains low in various countries, with factors like gender, education, professional

qualifications, training, and supervision influencing compliance. The effectiveness of PBF programs in increasing partograph use in some regions is noted. The importance of accurate partograph completion to ensure safe and effective obstetric care is also underscored in the studies. Further research needs to identify effective interventions to improve compliance in various contexts.

Abbreviations

WHO: World Health Organization; MMR: Maternal Mortality Ratio; PICOS: Population, intervention, comparators, outcomes, and study design; JBI: Joanna Brigg Institute; PBF: Performance-Based Financing

Ethics Approval and Consent to Participate

The authors have diligently adhered to all ethical considerations, including plagiarism, misconduct, data fabrication and falsification, double publication and submission, redundancy, and more.

Competing Interest

The authors have no conflict of interest to declare, financial, professional, or personal interest that might have affected the performance.

Availability of Data and Materials

The data presented in this study are available in this article.

Authors' Contribution

Conceptualization: WMN, data curation: WMN, S, SM, and LN; formal analysis: WMN, S, SM; data collection: WMN, S, SM; Validation: WMN, S,SM, and LN, writing— original draft: WMN; writing—review and editing: WMN, S, SM, and LN. All authors have reviewed and approved the manuscript.

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