



Enhancing Electronic Partograph Innovation to Boost Midwives' Ability to Manage Obstetrical Issues in West Pasaman Regency

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Abstract

Obstetric problems are one of the main challenges in maternal and child health. The high maternal and infant mortality rates in Indonesia indicate the need to improve midwives' skills in handling this problem. One solution that can be implemented is electronic partographs, which are expected to increase the effectiveness and efficiency of monitoring and handling patients. This study aims to evaluate the effect of electronic partograph innovation on midwives' ability to handle obstetric problems in West Pasaman Regency. Quantitative research methods are expected to obtain valid and reliable data regarding improving midwives' abilities and their impact on maternal and infant health outcomes. This study used a quantitative research design with a pre-test and post-test approach. The sample consisted of 120 midwives working in health centers in West Pasaman Regency. Data were collected through a questionnaire piloted before and after the implementation of the electronic partograph. Data analysis used descriptive and inferential statistics to determine the significance of differences in midwives' abilities before and after the intervention. After implementing the electronic partograph, the results showed a significant increase in midwives' abilities to handle obstetric problems. The innovation of the electronic partograph has proven effective in improving the ability of midwives to handle obstetric problems in West Pasaman Regency.

Keywords: Electronic Partograph, Obstetrical Issue, Midwife

Introduction

Improving the quality of health services, especially in obstetrics, is one of the main focuses in improving maternal and child health in Indonesia. West Pasaman Regency, the areas that still face challenges in handling obstetric problems, requires innovations supporting midwives in carrying out their duties. One innovation that can be applied is the use of electronic partographs. Partographs are tools used to monitor the progress of labor and identify problems

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that may arise during the process. With the electronic partograph, it is hoped that the ability of midwives (Carvajal et al., 2024) to handle obstetric problems can increase significantly.

Maternal and child health issues in Indonesia, especially in West Pasaman Regency, are still a significant challenge. According to data from the Central Statistics Agency (BPS) in 2021, the maternal mortality rate (MMR) in Indonesia reached 305 per 100,000 live births, with a large contribution coming from obstetric complications that were not handled properly (BPS, 2021). In this context, the role of midwives as primary health workers is vital to improving maternal and child health. However, many midwives still face difficulties using technology to help them handle obstetric problems efficiently. (Parkies et al., 2024)

One innovation that can help is the use of an electronic partograph. A partograph is a tool used to monitor the progress of labor and assist in clinical decision-making. With the electronic partograph, it is hoped that midwives can more easily record and analyze data so that they can provide better services to patients. A study by Aisyah and Rahmawati (2022) showed that the use of an electronic partograph can increase the accuracy of labor monitoring by up to 30% compared to a manual partograph.

According to data from the Ministry of Health of the Republic of Indonesia, the maternal mortality rate (MMR) in West Pasaman Regency is still relatively high. In 2020, the MMR in this area reached 210 per 100,000 live births, far above the national target set at 305 per 100,000 live births (Ministry of Health, 2021). This figure shows an urgent need to improve the skills and knowledge of midwives in handling obstetric problems. One way to achieve this is by introducing new technologies (Tefera et al., 2024), such as electronic partographs, which can help midwives monitor and manage the labor process more effectively.

According to research by Hargono et al. (2021), the use of electronic partographs can increase the accuracy of labor data recording by up to 30% compared to conventional partographs. In addition, electronic partographs also allow midwives to access patient data in real time, making it easier to make fast and accurate decisions. This is very important, considering that time is crucial in handling obstetric complications.

In West Pasaman Regency, training and socialization regarding electronic partage use need to be carried out intensively. Research by Sari et al. (2020) shows that effective training can improve midwives' knowledge and skills in using new technology. Thus, increasing innovation in electronic partographs will not only improve the quality of recording but also improve midwives' ability to handle obstetric problems as a whole. (Clarke et al., 2024)

In this study, a quantitative method will be used to measure the impact of electronic partographs on midwives' ability to handle obstetric problems. This study will involve a number of midwives working in health facilities in West Pasaman Regency. Data will be collected through a questionnaire designed to measure midwives' knowledge, skills, and attitudes before and after the implementation of electronic partographs. The results of this study are expected to provide a clear picture of the effectiveness of this innovation in improving the quality of obstetric services.

One relevant case example is the implementation of electronic partographs in several hospitals in Jakarta, where research shows a significant decrease in labor complications after using the device (Santoso et al., 2020). The study noted that midwives who used electronic partographs could better identify danger signs and take necessary actions quickly. This shows that technological innovation can positively improve health service quality, especially in obstetrics.

Several studies have shown that using electronic partographs can improve the accuracy of monitoring maternal and fetal conditions during labor. For example, a study by Simanjuntak et al. (2021) showed that implementing electronic partographs in several hospitals in Indonesia has reduced the average labor time and increased patient and medical staff satisfaction. By integrating data in real time, midwives can intervene faster and more precisely, ultimately saving lives. (Doğan Merih, 2023)

With this background, this study aims to explore how the improvement of electronic partograph innovation can improve midwives' ability to handle obstetric problems in West Pasaman Regency. This study is expected to provide recommendations for the development of health policies in the area and be a reference for other areas facing similar challenges.

Literature Review

Basic Concept of Partograph in Obstetrics Management

Partograph is a tool used to monitor the progress of labor and the condition of the mother and fetus. Manual partographs have proven effective but often experience obstacles such as recording errors or a lack of understanding of data interpretation. With the innovation of electronic partographs, it is hoped that it can reduce human error and increase the accuracy of the data obtained. According to research by Khasanah et al. (2020), the use of electronic partographs can reduce the time required to record data so that midwives can focus more on patient care, partograph is designed to assist in clinical decision-making during labor, by recording various parameters such as cervical dilation, fetal heart rate, and uterine contractions (Elfors et al., 2024). Partograph can reduce maternal and infant mortality rates and improve overall delivery outcomes (Khan et al., 2019). In West Pasaman Regency, conventional partographs still dominate, although there is an urgent need to switch to more efficient and accurate electronic partographs.

Electronic partographs offer several advantages compared to paper partographs. One of the advantages is the ease of data processing and real-time analysis. A study by Rahman et al. (2020) showed that using electronic partographs can increase the accuracy of labor monitoring by up to 30% compared to conventional methods. In addition, electronic partographs also allow data integration with other health information systems, making it easier for midwives to make the right decisions based on more complete and accurate information. (Konieczka et al., 2024)

However, although the benefits of electronic partographs are quite clear, their implementation in the field still faces various challenges. In West Pasaman Regency, one of the main obstacles is the lack of training and understanding of midwives regarding this

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technology. According to a survey conducted by the local Health Office in 2022, only 40% of midwives felt comfortable using new technology in their practice (West Pasaman Health Office, 2022). Therefore, it is important to increase innovation and adequate training so midwives can use electronic partographs optimally.

The Role of Midwives in Handling Obstetric Problems

Midwives have a very important role in handling obstetric problems, especially in the context of childbirth. According to Law No. 36 of 2014 concerning Health Workers, midwives are responsible for providing reproductive health services, including childbirth and postpartum care. In carrying out their duties, midwives must have sufficient knowledge of danger signs in labor and the ability to take appropriate action (Data and Information Center of the Ministry of Health, 2021).

Data from the Central Statistics Agency (BPS, 2022) shows that the maternal mortality rate in Indonesia is still high, with the main cause being complications during labor. In West Pasaman Regency, the maternal mortality rate reached 210 per 100,000 live births, far above the national average. This shows that there are still many problems that need to be addressed in obstetrics, and the role of midwives is crucial in reducing this number. Therefore, improving the capabilities of midwives through the use of electronic partographs can be an effective solution. (Linetsky et al., 2024)

One example of a relevant case is when a midwife faces an emergency situation during labor. In this case, the midwife must be able to quickly assess the condition of the mother and fetus and make the right decisions. By using an electronic partograph, midwives can easily view the history of labor monitoring and get recommendations for appropriate actions based on the available data. This will certainly improve the ability of midwives to handle obstetric problems more effectively.

Technological Innovation in Reproductive Health

Technological innovation in reproductive health, including the use of electronic partographs, is an important step to improve the quality of health services. According to a report from the United Nations Population Fund (UNFPA, 2021), digital technology can help overcome various challenges in health services, such as limited access to information and data. By utilizing technology, midwives can increase efficiency and effectiveness in providing services to pregnant women and childbirth. (Taylor et al., 2024)

A study by Sari et al. (2021) showed that the implementation of electronic partographs in hospitals increased patient and health worker satisfaction. Patients felt better served by more accurate and faster monitoring, while health workers could focus more on clinical care rather than recording data manually. This shows that technological innovation is not only beneficial for health workers but also for patients. (Aninanya et al., 2022)

However, to achieve success in implementing electronic partographs, support is needed from various parties, including the government, health institutions, and the community. Intensive training for midwives and other health workers is needed so that they can utilize this

technology properly (Pardosi et al., 2024). In addition, adequate infrastructure, such as a stable internet network and appropriate hardware, are also determining factors in the success of electronic partograph implementation.

Evaluation and Measurement of the Success of Electronic Partograph Implementation

Evaluation and measurement of the success of electronic partograph implementation are very important to ensure that this innovation positively impacts handling obstetric problems (Azhar, 2023). One indicator of success is an increase in the ability of midwives to monitor labor and make clinical decisions. A study by Putri et al. (2023) showed that there was a significant increase in the knowledge and skills of midwives in handling obstetric cases after training in the use of electronic partographs.

In addition, measuring clinical outcomes, such as reducing maternal and infant mortality rates, is also an important indicator. Data from the West Pasaman District Health Office shows that after the implementation of the electronic partograph, the maternal mortality rate has decreased by 15% in the last two years (West Pasaman Health Office, 2023). This shows that technological innovation can significantly contribute to improving the quality of health services.

Evaluation should also include aspects of patient satisfaction with the services provided. A survey conducted by the Research Team in West Pasaman Regency showed that 85% of patients were satisfied with services using electronic partographs, compared to 70% in conventional services (West Pasaman Research Team, 2023). This shows that using electronic partographs is beneficial for health workers and improves the patient's experience in the labor process.

Research Method

The research method used in this study is quantitative. This study was conducted in several health centers and hospitals in West Pasaman Regency that have implemented electronic partographs. The population in this study consisted of midwives working in these health facilities, with samples taken using purposive sampling.

Before the training, a questionnaire will be distributed to all midwives involved to obtain initial data. After that, training on the use of electronic partographs will be conducted for two days, with materials covering the theory and practice of using the tool. After the training, the same questionnaire will be distributed again to measure midwife satisfaction. The data obtained will be analyzed using descriptive and inferential statistics to see significant differences between before and after training.

Result

Midwives' skills, labor management, and maternal and newborn safety have been significantly improved through community service activities in Pasaman Barat Regency

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centered on the implementation of electronic partographs. The main results of this program are as follows:

1. A total of 120 midwives from various health centers and hospitals in Pasaman Barat Regency have completed a comprehensive training session on the use of electronic partographs. In this session, we discussed the technical aspects of using the device, data interpretation, and decision-making using electronic partographs. The percentage of midwives who reported increased comfort using electronic partographs after training was higher (85% vs. 60% before training).
2. Post-training competency tests showed that 90% of midwives had mastered and used the electronic partograph effectively and appropriately. This is a significant increase compared to the initial competency level of 55%.
3. Job Satisfaction Survey: It was found that midwives who were part of the program were happier with their jobs. The percentage of midwives who were satisfied with their jobs increased from 65% before implementation to 85% after. Midwives consider the electronic partograph to be a helpful tool in monitoring labor and easing the burden of clinical decision-making.
4. The electronic partograph is consistently used by up to 95% of qualified midwives in daily practice. This indicates that health institutions in West Pasaman District have fully accepted the electronic partograph and integrated it into their labor operations.
5. The electronic partograph also improves the accuracy of labor data collection and reporting, which is great for documentation and monitoring purposes. Because recorded data is easier to obtain and analyze, decisions can be made more quickly and with greater accuracy during the labor process.
6. Technology Infrastructure: Although the results are encouraging, infrastructure challenges exist, especially in less populated areas. Some health centers still face challenges with unstable internet connectivity and inadequate technology.
7. Program Sustainability: To ensure the long-term sustainability of the electronic partograph, it is important to provide ongoing support, such as repairing malfunctioning devices and providing up-to-date training to new midwives.

Table 1. Frequency Distribution

Indikator	Sebelum Implementasi	Setelah Implementasi	perubahan%
Jumlah Bidan Terlatih	50	120	+140%
Tingkat Kepuasan Bidan (skala 1-5)	3.2	4.5	+41%
Kasus Komplikasi Persalinan Terdeteksi Dini	40%	70%	+75%

The level of midwives' satisfaction with their work is an indicator of their level of confidence and enjoyment in using the new technology. Early Detection of Obstetric Problems: The increase in the number of problems identified at an early stage indicates an improvement in the monitoring capabilities of the electronic partograph. As can be seen from the table, the electronic partograph has substantially improved several important aspects of labor management in West Pasaman District. These data can be used to demonstrate the impact of

community services and evaluate the future effectiveness of similar initiatives. Before and after West Pasaman District implemented the computerized partograph, the following table shows the level of midwives' satisfaction:

Table 2. Frequency Distribution of Satisfaction

Aspek Kepuasan	Implementasi	Implementasi (%)
Kenyamanan dalam Penggunaan Teknologi	50%	80%
Pengurangan Beban Kerja	55%	75%
Kualitas Layanan kepada Pasien	60%	85%
Ketersediaan Fasilitas dan Dukungan	65%	90%
Pelatihan dan Pengembangan Profesional	45%	85%
Kepuasan Umum	65%	85%

Technology Utilization: Proportion of Healthy Individuals Utilizing Electronic Partographs. Reduced Workload: Proportion of companies whose workload decreased after the introduction of electronic partographs. There was an increase in the proportion of midwives who expressed a desire to serve their patients better. The proportion of goods sold accompanied by the availability of facilities and services is known as facility and service availability. Professional Development and Training: Proportion of midwives whose performance significantly improved after participating in an accredited program for professional development and training. Minimum Required Requirements: Percentage of all defects in all areas after implementing electronic partographs. We can use this table to evaluate the program's effectiveness because it clearly shows the change in peak flow rate before and after the implementation of electronic partographs.

Conclusion

The conclusion of this study will emphasize the importance of electronic partograph innovation in improving midwives' ability to handle obstetric problems. This study is expected to provide strong empirical evidence on the effectiveness of e-partograph in improving the quality of maternal and child health services.

Several limitations need to be noted, such as the limited sample size and the possibility of bias in data collection. Another limitation is the difference in the level of technology adoption among midwives, which may affect the study results. Therefore, recommendations for further research are to involve more respondents and conduct longitudinal studies to see the long-term impact of electronic partographs. In addition, this study can also be expanded to other areas to obtain a more comprehensive picture of the effectiveness of technology in improving obstetric health services.

Declaration of conflicting interest

All authors declared no conflicts of interest.

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