



**THE IMPACT OF USING THE MATERNAL NEONATAL EMERGENCY APPLICATION
(SIGNAL) FOR MIDWIVES**

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ABSTRACT

Maternal mortality rate (MMR) and neonatal mortality rate (NMR) in Indonesia are still a challenge in health services. Technological innovations such as the SIGNAL application (Maternal Neonatal Emergency Information System) were developed to improve early detection of high risk in pregnant women and neonates. Objective to determine the impact of using the SIGNAL application for midwives in improving the speed and accuracy of maternal neonatal emergency services in Bantul Regency. Descriptive quantitative research with a cross-sectional approach was conducted on 50 midwives using SIGNAL at the Bantul Regency Health Center. The sampling technique used purposive sampling with a total of 50 respondents who actively used the SIGNAL application. Data were collected through questionnaires and analyzed descriptively. The results showed that 82% of midwives felt helped in early identification of high risk, 76% stated that referrals were faster, and 70% felt that the application increased confidence in making clinical decisions. The main obstacles were internet network and device limitations. The use of the SIGNAL application has a positive impact on improving the quality of maternal neonatal emergency services by midwives in Bantul Regency, although improvements in supporting infrastructure are still needed.

Keywords: bantul; early detection; emergency; maternal neonatal; midwife; signal application

How to cite (in APA style)

Margaretha, S. E. P. M., Putrianti, B., Wulandari, A., Urrahman, D., & Marwanta, Y. Y. (2025). The Impact of Using the Maternal Neonatal Emergency Application (SIGNAL) for Midwives. *Indonesian Journal of Global Health Research*, 7(3), 921-926. <https://doi.org/10.37287/ijghr.v7i3.6185>.

INTRODUCTION

Maternal Mortality Rate (MMR) and Neonatal Mortality Rate (NMR) are still a serious challenge in efforts to improve public health status in Indonesia. Maternal Mortality Rate (MMR) is one of the indicators of the success of a country's development because improving the quality of life of women is one of the conditions for the development of human resources (Arifin, 2023). The welfare of the people in a country can be assessed by several indicators, one of which is the minimum MMR (Hakim, 2024). According to Redaksi Mediakom (2024), reported by sehatnegeriku.kemkes.go.id, revealed that the number of maternal deaths in 2022 reached 4,005 and in 2023 increased to 4,129. Meanwhile, infant deaths in 2022 amounted to 20,882 and in 2023 reached 29,945. Most cases of maternal deaths are caused by complications during pregnancy, childbirth, and the postpartum period that are treated late, such as preeclampsia, bleeding, infection, and other obstetric complications. Similarly, in neonates, risk factors such as asphyxia, infection, and prematurity are often detected late, increasing the risk of death.

As the spearhead of maternal and child health services, midwives have a very vital role in conducting early detection of high risks in pregnant women and neonates, providing initial emergency services, and determining the need for referral to advanced health facilities. However, in practice, midwives in the field often face various challenges such as limited resources, access to health facilities, and constraints in making quick decisions in emergency situations. To answer these challenges, innovations in the field of information technology began to be developed, one of which is the Maternal Neonatal Emergency Application (SIGNAL). An application is a program that is ready to be used in carrying out certain functions for users and can also be used by other intended application users (Renhoran, 2023). The SIGNAL application is designed as a decision support system for midwives in recognizing danger signs and risk factors early on, facilitating case recording and reporting, and accelerating the referral process to referral health facilities. This application is expected to be an effective tool in improving the quality of maternal neonatal health services and accelerating the handling of emergency cases.

Bantul Regency as one of the regions with a large area coverage and variations in geographical conditions is a strategic location to implement the SIGNAL application. The application is expected to improve the performance of midwives in handling emergency cases quickly and precisely so as to reduce maternal and newborn mortality rates. However, the successful implementation of the SIGNAL application depends not only on the availability of the application itself, but also on the level of understanding and skills of midwives in using it, as well as infrastructure support such as internet networks and adequate technological devices. Therefore, this study is important to determine the impact of using the SIGNAL application for midwives in Bantul Regency in improving the speed, accuracy, and quality of maternal neonatal emergency services. The results of this study are expected to provide input for local government, maternal and child health program managers, and application developers in developing strategies to strengthen referral systems and maternal and neonatal health services more effectively and efficiently.

METHOD

This study used a quantitative descriptive design with a cross-sectional approach. The population was all midwives in Bantul Regency who had used the SIGNAL application for at least three months. The sampling technique used purposive sampling with a total of 50 respondents who actively used the SIGNAL application. The research instrument was a structured questionnaire which included variables of service speed, accuracy of risk identification, and application usage constraints. Data was collected through an online questionnaire and semi-structured interviews. Data were analyzed descriptively using percentages and were supported by the SPSS version 25 application.

RESULT

This study was conducted on 50 midwives in Bantul Regency who have used the Maternal Neonatal Emergency Application (SIGNAL) in carrying out their duties. The results showed that the SIGNAL application had various positive impacts, ranging from improving risk identification skills to accelerating the referral process. However, some obstacles are still encountered in the field. Details of the research results are presented in table 1 below:

Table 1.
Impact of Using the SIGNAL Application for Midwives

Aspects assessed	f	%
Helps early identification of high risk	41	82
Speeds up the referral process	38	76
Increases confidence in making clinical decisions	35	70

Table 1 shows that most midwives (82%) found the SIGNAL application helpful in conducting early identification of high risk pregnant women and neonates. In addition, 76% of midwives felt that the referral process to referral health facilities was accelerated. The use of the application also had an impact on increasing midwives' confidence in making clinical decisions, as felt by 70% of respondents. In addition to the positive impacts, this study also identified several obstacles faced by midwives in using the SIGNAL application. Details of the obstacles felt by midwives are presented in table 2 below:

Table 2.
Midwives' Obstacles in Using the SIGNAL Application

Type of Obstacle	f	%
Internet network constraints	30	60
Device limitations (smartphone)	24	48
Requires further training	16	32

Table 2 shows that the main obstacle faced by midwives in using the SIGNAL application is internet network problems, which were felt by 60% of respondents. In addition, device limitations such as smartphones with low specifications are also an obstacle for 48% of midwives. As many as 32% of respondents stated that they still needed further training to be more optimal in operating the SIGNAL application.

DISCUSSION

The results of this study indicate that the use of the SIGNAL application has a positive impact on improving the quality of midwifery services, especially in handling maternal and neonatal emergencies in Bantul Regency. Most midwives stated that this application is very helpful in the process of early identification of high risk in pregnant women and neonates. This is important considering that delay in recognizing risk is one of the main causes of high maternal and infant mortality in Indonesia. With the risk identification feature in the SIGNAL application, midwives can quickly and systematically assess the condition of pregnant women and newborns based on standardized clinical parameters. This process allows midwives to make early decisions regarding the need for referral to advanced health facilities, so that the potential for more severe complications can be minimized. The results of this study are in line with several previous studies showing that the use of digital technology in maternal health services can accelerate clinical decision-making and reduce referral delays (Ajis et al., 2022).

In addition, the use of the SIGNAL application also increases midwives' confidence in carrying out their professional practices. As many as 70% of midwives stated that they felt more confident when they had to make important decisions in emergency conditions. This shows that the SIGNAL app can act as an important tool in improving the capacity and competence of midwives in the field. With the help of the application, the consultation process between patients and midwives will be better organized and provide convenience in the communication process and the booking process or appointment schedule will be more effective because it has been confirmed (Nazariyan, 2023). An interview with one of the midwives at one of the puskesmas revealed that “with the SIGNAL application, we know the initial actions faster before referral, and this is very helpful when we deal with patients with pregnancy complications who come at night.” (Personal Interview, November 2024) This statement shows that SIGNAL not only supports administrative efficiency, but also has a direct impact on the speed of clinical services.

However, the study also found some challenges that still need to be overcome. The biggest problem faced by midwives is internet network constraints, which was felt by 60% of respondents. This limitation certainly affects the smooth use of the application, especially in areas with minimal technological infrastructure. In addition, limited devices such as

smartphones with low specifications are also an obstacle for 48% of midwives. Some midwives even expressed the need for further training to further master this application. These results are important to be considered by local governments and policy makers in formulating strategies to strengthen maternal and neonatal health services. The successful implementation of the SIGNAL application does not only depend on the availability of the application itself, but also requires infrastructure support, availability of adequate devices, and human resource capacity building through continuous training. In general, the findings of this study strengthen the evidence that the use of digital technology such as SIGNAL can be one of the effective solutions in reducing maternal and infant mortality, provided that it is followed by efforts to improve the support system in the field (Devi et al., 2022).

However, the study also found some challenges that still need to be overcome. The biggest problem faced by midwives is internet network constraints, which was felt by 60% of respondents. This limitation certainly affects the smooth use of the application, especially in areas with minimal technological infrastructure. In addition, limited devices such as smartphones with low specifications are also an issue for 48% of midwives. Some midwives even expressed the need for further training to further master this application. The same thing was also felt by midwives practicing independently in Pelalawan Regency, Riau, where midwives experienced several similar challenges such as incomplete data collection due to network constraints (Fonda et al., 2024). Similar issue were also found in using a special application to connect doctors and midwives with pregnant women patients in the Sidoarjo Regency area, where the application requires a stable internet network but the signal in some locations is inadequate (Sari & Ernawaty, 2020). Although in 2021 the proportion of the population using cellular phones reached 81.28% and in 2022 it increased to 81.32% and in 2023 to 81.54%, it does not rule out the possibility that the network is still an issue (Irfan, 2024).

Interviews with other midwives at Puskesmas showed that the most perceived obstacle is that not all midwives have the same understanding in operating the application, especially for those who are not familiar with technology. "Sometimes when there is a new feature update, we are confused and have to ask first. There should be regular training," she said (Personal Interview, November 2024). This emphasizes the importance of continued training and regular technical support. These results are important to be considered by local governments and policy makers in formulating strategies to strengthen maternal and neonatal health services. The successful implementation of the SIGNAL application does not only depend on the availability of the application itself, but also requires infrastructure support, the availability of adequate devices, and increasing the capacity of human resources through continuous training. In general, the findings of this study strengthen the evidence that the use of digital technology such as SIGNAL can be one of the effective solutions in reducing maternal and infant mortality, provided that it is followed by efforts to improve the support system in the field. The results of this study are also in line with the findings found by Fitriani & Rahman (2020) who stated that "Overall, application-based technology plays a positive role in helping health workers to overcome health problems." The presence of applications such as SIGNAL is one concrete example of how digital technology can strengthen the role of health workers, especially in emergency situations that require speed and accuracy of decision making.

CONCLUSION

Based on the results of the research conducted, it can be concluded that the use of the Maternal Neonatal Emergency Application (SIGNAL) has a positive impact on midwives in Bantul Regency in improving the quality of maternal and neonatal emergency services. The SIGNAL application is proven to assist midwives in conducting early identification of high

risks in pregnant women and neonates, accelerating the referral process to referral health facilities, and increasing midwives' confidence in making clinical decisions in the field. Nevertheless, there are several obstacles that midwives still face in using this application, including limited internet networks and less supportive devices. In addition, there is still a need for further training so that the utilization of the SIGNAL application can be more optimal and evenly distributed throughout Bantul Regency. Therefore, local government and related parties need to pay attention to the importance of strengthening technological infrastructure, providing adequate devices, and capacity building programs for midwives. With adequate support, the SIGNAL application has great potential to become one of the strategic innovations in efforts to reduce maternal and infant mortality in Bantul Regency and in other regions in Indonesia.

REFERENCES

- Ajis, A., Azizie, F., Dewi, W. A., Rifai, A., & Nurfalih, R. (2022). Penerapan Metode Rapid Application Development (RAD) Aplikasi Pelayanan Pasien Berbasis Web pada Bidan Leni Karlina. *Formosa Journal of Applied Sciences*, 1(4), 335–348. <https://doi.org/10.55927/fjas.v1i4.1160>
- Arifin, Z. (2023). Implementasi Pelayanan Kesehatan dalam Penurunan Angka Kematian Ibu. *Journal of Health Research" Forikes Voice*, 14(4), 6–10. <https://doi.org/10.33846/sf14102>
- Devi, S. P., Anshari, F., & Kaligis, R. A. W. (2022). Peran Bidan Sebagai Agen Perubahan Dalam Sosialisasi Tele-Ctg Untuk Kesehatan Ibu Hamil. *CoverAge: Journal of Strategic Communication*, 12(2), 108–121. <https://doi.org/10.35814/coverage.v12i2.3161>
- Fitriani, R., & Rahman, L. O. A. (2020). Pengembangan Aplikasi Sistem Pakar (Expert System) Untuk Diagnosa Penyakit Dan Masalah Pada Anak: Studi Literatur. *Jurnal Mitra Kesehatan*, 2(2), 96–102. <https://doi.org/10.47522/jmk.v2i2.37>
- Fonda, Y. F., Gunarmi, G., & Dedi, B. (2024). Implementasi Program Pemerintah tentang Aplikasi E- Kohort bagi Bidan Praktik Mandiri di Kabupaten Pelalawan Riau. *Jurnal Ilmiah Kesehatan Rustida*, 12(1), 11–26. <https://doi.org/10.55500/jikr.v12i1.244>
- Hakim, A. R. (2024). Pelatihan Penggunaan Aplikasi Mobile Untuk Klasifikasi Metode Persalinan Pada Ibu Hamil. *Jurnal Ilmiah Pengabdian Kepada Masyarakat*, 8(2), 426–433. <https://doi.org/10.20956/pa.v8i2.25847>
- Irfan, A. A. F. N. (2024, November 25). Semakin Sedikit Rumah Tangga Indonesia yang Punya Telepon Rumah. *GoodStats*. <https://data.goodstats.id/statistic/semakin-sedikit-rumah-tangga-indonesia-yang-punya-telepon-rumah-JUq2m#:~:text=Di tahun 2021%2C proporsi penduduk,tahun yang menggunakan telepon seluler.>
- Nazariyan. (2023). Pembangunan Aplikasi Layanan Kesehatan Untuk Konsultasi Kebidanan Masyarakat Berbasis Android (Studi Kasus Daerah Kecamatan Sambas, Kalimantan Barat). *INTER TECH*, 1(2), 44–50. <https://doi.org/10.54732/i.v1i2.1063>
- Redaksi Mediakom. (2024, January 25). Agar Ibu dan Bayi Selamat. *Sehat Negeriku*. <https://sehatnegeriku.kemkes.go.id/baca/blog/20240125/3944849/agar-ibu-dan-bayi-selamat/>
- Renhoran, M. (2023). Pengembangan Aplikasi Monitoring dan Panduan Ibu Hamil Berbasis Android. *E-Proceeding of Engineering*, 10(6), 5465–5478.

<https://openlibrarypublications.telkomuniversity.ac.id/index.php/engineering/article/view/21650>

Sari, E. F., & Ernawaty, E. (2020). Hambatan Bidan Dalam Penggunaan Aplikasi SI CANTIK. *Media Gizi Kesmas*, 9(2), 41. <https://doi.org/10.20473/mgk.v9i2.2020.41-47>.