

Empowerment by enhancing the knowledge of community health center provider regarding the risks of preeclampsia

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ABSTRACT

Preeclampsia is the most common hypertensive complication during pregnancy. Additionally, preeclampsia is a leading cause of high morbidity and mortality rates. One of the healthcare professionals who plays a crucial role in providing health services to pregnant women at community health centers is the midwife and doctor. Therefore, it is necessary to strengthen the role of healthcare in community health centers to reduce the risk of morbidity and mortality due to preeclampsia. This community program aims to enhance the knowledge of midwives and doctors about preeclampsia particularly in terms of follow-up at both the primary and advanced levels. There are 74 midwives and doctors from the community health center in Surabaya participating in this event. This activity was carried out using the health education method combining discussions, and a Q&A session about preeclampsia. The measurement of knowledge levels was conducted using pre-test and post-test. From the results of the test, it was found that there was an increase in the average score of more than 50 percent. Based on the statistical test, the significance value in this study is 0.005 (p-value < 0.05). The results indicate that community programs can enhance the knowledge of midwives and doctors regarding preeclampsia effectively.

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1. INTRODUCTION

According to the WHO report in 2020, it was stated that nearly 800 mothers die each day from preventable causes related to pregnancy and childbirth. Although the Maternal Mortality Ratio (MMR) has decreased by about 34 percent over the past 20 years, the MMR remains relatively high globally, especially in countries with lower-middle-income levels. In fact, 95 percent of maternal deaths occur in countries with lower-middle-income levels. In 2020, the average of MMR in low-income countries was around 430 per 100,000 live births, while in high-income countries, the was only about 12 per 100,000 live births. The significant difference in the number of maternal mortalities reflects the existence of gaps and inequalities in access to healthcare services (World Health Organization, 2022). In Indonesia, the MMR was recorded at 207 per 100,000 live births in 2022. Meanwhile, in East Java Province, the MMR was recorded at 93 per 100,000 live births in 2022. This achievement has decreased compared to 2021,

which reached 234.7 per 100,000 live births ([Dinas Komunikasi dan Informatika Provinsi Jawa Timur, 2023](#)). Despite experiencing a significant decline, the achievement of the MMR in both Indonesia and East Java is still considered high. If referring to the Sustainable Development Goals (SDGs), the target for the MMR is 70 per 100,000 live births by 2030 ([Kementerian Kesehatan Republik Indonesia, 2022](#)).

The high maternal mortality rate is caused by the risks faced by mothers during pregnancy, childbirth, and the postpartum period. Several risk factors that can affect directly the health of pregnant women include socioeconomic conditions, which are one of the indicators of maternal nutritional status, suboptimal health before and during pregnancy, complications during pregnancy and childbirth, inability to access healthcare facilities, especially prenatal and obstetric services, lack of information regarding health during pregnancy and postpartum, and cultural beliefs and practices that are detrimental to maternal health ([Samuel et al., 2021](#)). According to the World Health Organization, most complications that occur during pregnancy are preventable if they can be detected earlier. The main complications that account for nearly 75 percent of all maternal deaths are bleeding, infection, high blood pressure (preeclampsia and eclampsia), complications during childbirth, and unsafe abortions. There are several classic causes of maternal death, namely bleeding, infection, preeclampsia, prolonged labor, and unsafe abortion ([World Health Organization, 2022](#)).

Preeclampsia is the most common hypertensive complication that occurs during pregnancy. Every year, preeclampsia causes more than 70,000 maternal deaths and 500,000 fetal deaths worldwide. In addition, preeclampsia is also a major cause of high rates of intensive care, cesarean sections, low birth weight (LBW) infants, fetal growth restriction, premature rupture of membranes, and prematurity ([Burton et al., 2019](#)). As a multifactorial disease, there are various risk factors for the occurrence of preeclampsia, including a history of preeclampsia in previous pregnancies, obesity, being a first-time mother, kidney disease, chronic hypertension, advanced age, multiple pregnancies, and pregestational or gestational diabetes mellitus ([Karimi-Zarchi et al., 2021](#)). The clinical manifestations of preeclampsia can vary from mild to severe symptoms such as ischemia, vasospasm, and endothelial dysfunction, which then trigger major stress and systemic inflammation in both the mother and the fetus ([Madendag et al., 2022](#)). The etiology of preeclampsia during pregnancy is estimated to be related to the failure of placental development, failure of implantation, and failure of spiral artery remodeling ([Nirupama et al., 2021](#)). This leads to uteroplacental dysfunction and maternal vascular malperfusion, accompanied by alterations in immunoregulation and inflammatory response. Alterations in the immune response are characterized by an increase in the number of neutrophils, platelet activation, and systemic inflammatory processes that clinically affect the mother and fetus.

Preeclampsia has a long preclinical phase before clinical manifestations appear in the second to third trimester of pregnancy, with severity levels varying from mild manifestations to severe forms that threaten the lives of both the mother and the fetus. Although termination efforts may be the only therapeutic solution to stop systemic inflammation, termination is not always the right choice, especially at a gestational age that tends to be premature, with a relatively low survival rate for the fetus in an extrauterine environment. Thus, early detection efforts for the risk of preeclampsia as a prospective approach are essential to determine the degree of severity and to serve as a predictor of complications based on the observable level of severity ([Stevanović et al., 2020](#)).

Reducing progressively and sustainably the MMR has become one of the programs of the Ministry of Health in the 2024 Strategic Plan. Several programs that have been implemented include the Program Perencanaan Persalinan dan Pencegahan Komplikasi (P4K), Bantuan Operasional (BOK) to community health centers in districts and cities, the Safe Motherhood Initiative, Gerakan Sayang Ibu, the Making

Pregnancy Safer Program (MPS), the Expanding Maternal and Neonatal Survival Program (EMAS), as well as the distribution and equitable allocation of midwives at the districts aimed at bringing maternal and newborn health services closer to the community. In the community sphere, several community service programs have been carried out in various regions, including "Education Strategy for Family Empowerment in Optimizing the Prevention of Pre-eclampsia (PE) in Pregnant Women at the Pragaan Health Center, Sumenep Regency" by [Ahmaniyah and Puspitasari \(2024\)](#), "Assistance to the Community on Early Detection and Dangers of Pre-eclampsia in Pregnant Women in Wonokromo Village" by [Umamah et al \(2023\)](#), "Education on the Dangers and Prevention of Pre-eclampsia During Pregnancy" by [Marbun and Irnawati \(2023\)](#), "Community Assistance Regarding Pregnant Women in Simbang District, Maros Regency" by [Subriani et al \(2022\)](#), and "Health Promotion on Pre-eclampsia for Pregnant Women in Kenderan Village, Tegalalang District, Gianyar Regency" by [Putri et al \(2024\)](#). Based on the programs that have been implemented, there is a commonality in the efforts to enhance the knowledge and empower pregnant women regarding the risks of preeclampsia. In all of these programs, pregnant women become the center of attention and the main target of the activities. In the effort to reduce maternal mortality rates and eradicate preeclampsia, ideally, the involvement of multiple related sectors will make it more feasible to achieve a decrease in maternal mortality and eradicate preeclampsia. As one of the efforts supporting the Indonesian Ministry of Health's program to reduce maternal mortality rates and eradicate preeclampsia, UPPM FK UNUSA, in collaboration with Ahmad Yani Islamic Hospital Surabaya (RSI Ahmad Yani), conducted a community service activity packaged in the event "Hospital Tour with Primary Health Facilities." This community service activity aims to enhance the knowledge and understanding of preeclampsia among midwives and doctors at community health centers in Surabaya, who are the primary healthcare providers at the community health center. Healthcare workers in these facilities, namely midwives and doctors, are considered to play a crucial role in efforts to reduce maternal mortality rates and improve the health status of mothers and infants. In addition to aiming to increase the knowledge of midwives and doctors at community health centers about preeclampsia, this community service activity also represents a form of cross-sectoral collaboration to reduce maternal mortality rates due to preeclampsia, especially in Surabaya.

2. METHODS

The objective of this program is to implement community service efforts aimed at reducing the mortality rate due to preeclampsia during pregnancy in Surabaya. Additionally, this initiative seeks to increase the coverage of maternal and child well-being throughout pregnancy. Another key goal is to enhance cross-sectoral collaboration to reduce morbidity and mortality among mothers and fetuses affected by preeclampsia. This effort involves cooperation between educational institutions and healthcare providers, ensuring a comprehensive approach to tackling the issue.

The primary target of this community service program is midwives and doctors working at all community health centers in Surabaya. By focusing on these healthcare professionals, the program aims to enhance their ability to manage preeclampsia effectively and improve maternal health outcomes. This program offers multiple benefits for various stakeholders. For midwives and doctors, it provides an opportunity to enhance their knowledge, upgrade their understanding of preeclampsia in pregnant women, and improve their clinical skills in assessing the degree of preeclampsia risk. This enables better monitoring at the primary level and improves clinical communication between midwives, doctors, pregnant women, and their families. As a result, pregnant women and their families can be more vigilant about high-risk pregnancies.

For community health centers, this program supports the training and empowerment of midwives and doctors, assists in implementing health promotion programs, and increases the coverage of prenatal check-up visits at both primary and advanced health facilities according to standard guidelines. Meanwhile, hospitals benefit from this initiative by optimizing healthcare worker empowerment programs and reducing the incidence of morbidity and mortality caused by delays in decision-making, accessing healthcare facilities, and receiving treatment due to limited resources. This community service activity is conducted at Ahmad Yani Islamic Hospital in Surabaya (RSI Ahmad Yani). The selection of this location ensures accessibility and effective collaboration between healthcare institutions and educational organizations.

The implementation of community service activities is divided into three stages: (1) Preparation, (2) Implementation, (3) Evaluation.

Preparation

The activities included in the preparation stage involve surveying the activity location, which is then followed up by completing the necessary permits with the Islamic Hospital of Surabaya Ahmad Yani (RSI Ahmad Yani) and Dinas Kesehatan Kota Surabaya in the form of a notification letter to all community health centers in Surabaya. In addition to surveying the activity location, the preparation stage also includes a survey of the target partner's issues as an initial step to identify problems so that the material provided is on target and meets the needs. The internal preparation stage carried out by the UPPM FK UNUSA team includes preparing educational materials and gathering the necessary equipment for the day of the event.

Implementation

This community service activity involves midwives and doctors from all community health centers in Surabaya as participants in the event. The event held on September 7, 2024, began with the signing of the attendance list. The event was opened by the Director of Islamic Hospital Surabaya, Ahmad Yani. The measurement of participants' knowledge and understanding regarding preeclampsia was conducted using a pre-test and post-test. The presentation on "Preeclampsia Risks in Pregnancy" covered definitions, terminology, etiology, diagnosis, and management both in Primary Health Care Facilities and in Advanced Referral Health Facilities by the specialist in obstetrics and gynecology speaker using PowerPoint presentation and several supporting materials such as medical record results, leaflets, and posters. After the presentation of the material, there was a discussion and a question-and-answer session between the participants and the speaker for about 30 minutes. Then, after the discussion session ended, the team distributed the post-test sheets. The community service activity concluded with a documentation session, followed by a closing activity.

Evaluation

The final step of this community service program consists of evaluation and the preparation of an activity report. The evaluation aims to compare the participants' knowledge and understanding before and after the intervention, which includes the presentation of materials, discussions, and question-and-answer sessions with the speakers. Data analysis using SPSS software with paired t-test (for normally distributed data) or Wilcoxon test (for anomaly distributed data). In addition to evaluating the results of the pre-test and post-test as a measure of knowledge improvement, the evaluation of the community service activities is also observed from the implementation of the activities and the involvement of participants and organizers. At the evaluation stage, a report on the activities is also prepared as an

accountability report for the activities that have been carried out. The results of this evaluation, can serve as a foundation for collaboration or partnership between the UPPM FK UNUSA and the Islamic Hospital of Surabaya Ahmad Yani in further collaboration.

3. RESULTS AND DISCUSSION

The community service activity titled "Empowerment by Enhancing the Knowledge of Community Health Center Provider Regarding the Risks of Preeclampsia" was successfully conducted on Saturday, September 7, 2024, at the Islamic Hospital of Surabaya Ahmad Yani. The event commenced with an official opening by the Director of the Islamic Hospital of Surabaya Ahmad Yani, followed by a brief presentation of the hospital's profile. This presentation also included an overview of the maternal and child health (MCH) services provided by the hospital, ensuring that participants were well-informed about the available healthcare facilities and programs.

A total of 74 midwives and doctors from various community health centers attended the event, as recorded in the provided attendance list. The participants engaged enthusiastically throughout the sessions, which included informative presentations, interactive discussions, and Q&A sessions with the speakers. Their active participation demonstrated a strong interest in the topic and a commitment to improving maternal healthcare services.

The presenting team received highly positive feedback from the participants, reflected in the conducive atmosphere of the event. Many attendees expressed curiosity and eagerness to deepen their understanding of preeclampsia, leading to dynamic discussions and insightful exchanges of knowledge. The interactive nature of the sessions further reinforced the effectiveness of the program in enhancing the knowledge and preparedness of midwives and doctors in handling preeclampsia cases. Through these structured stages, this program is expected to significantly contribute to reducing the adverse effects of preeclampsia in Surabaya, enhancing the knowledge and skills of healthcare professionals, and improving maternal and child health outcomes.



Figure 1. Presentation of preeclampsia

All participants in the activity can fill out the pre-test and post-test forms. This indicates that all participants were able to engage in the activity from start to finish. Figure 2 is a table depicting the results of the pre-test and post-test of the participants in the activity.

Based on the results of the pre-test and post-test, it can be concluded that all participants were able to understand the material on preeclampsia presented by the speaker. This is reflected in the pre-test scores, which showed significant improvement. Figure 3 is a table depicting the average scores of the pre-test and post-test of the participants in the activity.

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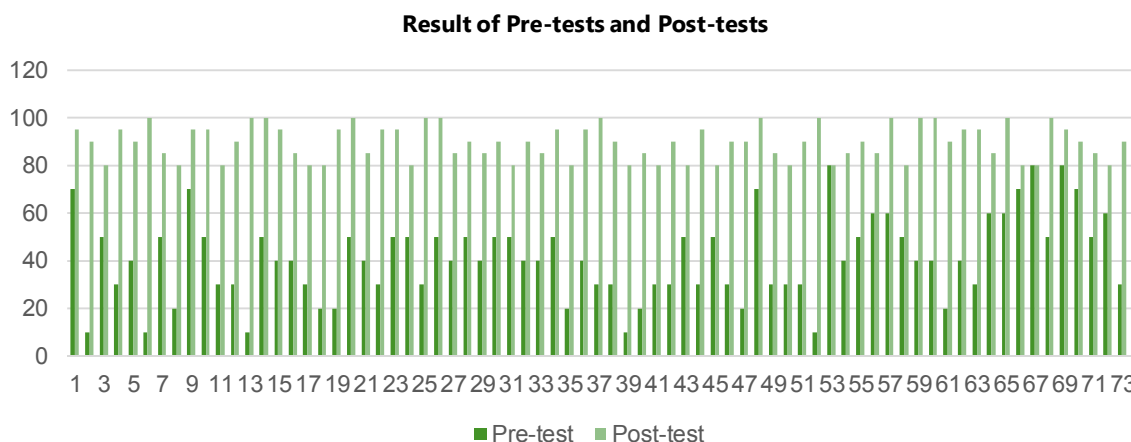


Figure 2. Participants result of pre-tests and post-tests

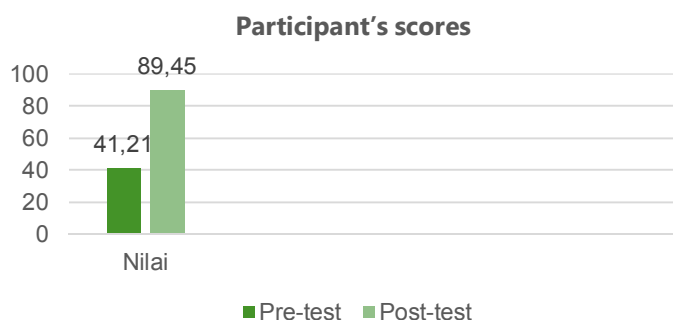


Figure 3. Participant's average scores of pre-tests and post-tests

Based on the average scores of the pre-test and post-test in Figure 3, it can be observed that there is an increase in the average score of 53.93 percent. The average pre-test score is 41.21, while the average post-test score is 89.45. The achievement of the average pre-test and post-test scores indicates an improvement in the knowledge and understanding of the midwives and doctors who participated in the activity.

Furthermore, the findings of the normally distributed data meet the researchers' requirements to use the paired T-test in SPSS 26 as a statistical analysis test. The paired T-test is a data analysis test aimed at comparing the difference in average values from two paired samples. Paired samples are the same samples, but each is tested under different conditions and situations. In this case, the difference in subjects lies in the before and after they were given material on preeclampsia. The results of the paired T-test analysis with a 95 percent confidence interval show a value of α 0.005 ($p < 0.05$). Based on the results, it can be concluded that there is a difference in the level of knowledge of the participants before and after the material was provided. This indicates that the material provided can significantly enhance the participants' knowledge about preeclampsia effectively.

Complications during pregnancy and childbirth are estimated to occur in 15 percent of pregnancies and deliveries. Some of these complications can be life-threatening, but generally, most of them can

be prevented and managed, especially if: (1) The mother can access healthcare providers promptly; (2) Healthcare providers perform appropriate handling procedures, such as using a partograph to monitor the normal progression of labor and implementing active management of the third stage to prevent postpartum hemorrhage; (3) Healthcare providers can identify complications early; (4) Healthcare providers can take additional actions as needed; (5) There is an effective referral process; (6) Services are quick and appropriate.

According to the World Health Organization report, it shows that midwives are able to meet 87 percent of women's essential health service needs. This shows that midwives play an important role in meeting women's needs related to sexual and reproductive health and in maintaining women's health throughout their life cycle. As a partner, a midwife must place women at the center and as the recipients of maternity services. This is in line with the principle of women-centered services that prioritize women's rights. In midwifery care, one way to implement this is by encouraging women to empower themselves and make decisions about their own lives through communication, information, and counseling processes. One program that positions midwives as the primary and important care providers is the program with a Respectful Maternity Care (RMC) approach (Wiyanti et al., 2020).

According to World Health Organization (2022), every woman has the right to attain the highest standard of health, including the right to receive dignified and respectful healthcare during pregnancy and childbirth". To realize and fulfill that right, a Respectful Maternity Care (RMC) approach is implemented. Respectful Maternity Care (RMC) is a comprehensive approach aimed at fulfilling a Woman's Health and Reproductive Rights. There are several important components included in the RMC approach, such as healthcare that is free from violence and abuse, maintaining client confidentiality and privacy, safeguarding rights, especially the reproductive and sexual rights of women, providing information, and ensuring informed consent that has been understood by women, ensuring the availability of continuous access to support from the nearest social environment, improving the quality of physical and environmental resources, prioritizing effective two-way communication, respecting women's choices regarding childbirth, and ensuring the availability of competent human resources to facilitate the RMC approach. The comprehensive RMC-based approach is very important for at-risk pregnant women as well as those who have experienced preeclampsia. This is because the RMC approach encourages effective communication between healthcare providers and pregnant women and their families, thereby initiating the formation of mutually beneficial health decisions for the mother. Additionally, the RMC approach greatly facilitates the establishment of a collaborative relationship between mothers and healthcare providers. In cases of preeclampsia, it is very important to provide a detailed explanation regarding preeclampsia, including its prognosis and implications, so that an upgrade in knowledge about preeclampsia for healthcare workers is greatly needed. Transferring optimal understanding from healthcare professionals to clients will assist in shared decision-making. This has become an important aspect in the RMC approach (Bostrom et al., 2018; Koi-Larbi et al., 2024).

Based on the description, the community service program titled "Empowerment by Enhancing the Knowledge of Community Health Center Providers Regarding the Risks of Preeclampsia" serves as an initial step in realizing the role of midwives in providing RMC-based services. In this activity, the presentation of the material provided is one aspect that fulfills the strengthening of knowledge in a deeper understanding of preeclampsia. An understanding of preeclampsia is expected to serve as an important foundation for conducting clinical communication with pregnant women experiencing preeclampsia and their families. An optimal understanding by midwives will play a crucial role in assisting mothers and families in making important clinical decisions that benefit the health of both the mother and the fetus. This emphasizes that the role of midwives in efforts to reduce maternal mortality rates in Indonesia is not only to provide midwifery care but also to empower mothers and the community

to become more knowledgeable about their own health and that of their families. The importance of the role of midwives in improving maternal and child health is also highlighted in the research by [Nove et al \(2021\)](#), which states that the availability and ease of access to midwives can have a direct impact on significantly reducing maternal mortality rates and neonatal mortality rates, especially in low- and middle-income countries. However, to realize that potential, midwives need to possess knowledge, skills, and competencies following the recommendations of ICM and national midwifery organizations to better align with the needs and standards of care. There is a need for continuous enhancement of midwives' potential and efforts to minimize challenges that may limit the role of midwives so that they can provide comprehensive and optimal health services for sexual and reproductive health, mothers, and newborns.

In addition to midwives, the role of doctors in efforts to reduce maternal mortality is also very important. Although general practitioners in primary care facilities do not focus on maternal and child health, they can serve as health providers, particularly in the aspect of antenatal care (ANC). According to research by [Kafi et al \(2019\)](#), midwives and doctors can work together simultaneously and comprehensively to provide quality ANC services for mothers. It is mentioned that doctors who can provide comprehensive ANC services can reduce the risk of complications during pregnancy and childbirth by 32 percent. In addition, efforts to improve the quality of doctors can be a way to strengthen primary care at the grassroots level ([Doty et al., 2020](#)).

Based on the method, this community service activity is conducted using a counseling approach for midwives and doctors at the community health center as participants, which includes material presentations, group discussions, and question-and-answer sessions. Generally, health education is conducted to convey health messages to target groups regarding health issues following the needs of the target group. Health education is a series of processes aimed at initiating change, growth, and personal development to achieve specific health goals. The measurement of the success of health education is not only assessed by the amount of material that can be delivered but also by how far the collaborative learning process can enhance awareness, knowledge, and new skills that can change the behavior of the target group towards a better life ([Iyong et al., 2020](#); [Waryana, 2016](#)). In this activity, measuring the participants' level of knowledge using pre-test and post-test sheets is part of assessing the program's success in the short term. The hope is that not only will knowledge increase, but also the sensitivity and vigilance of midwives and doctors towards pregnant women at high risk of preeclampsia will continue to improve. The presence of early awareness will further encourage and enhance the coverage of early detection efforts for preeclampsia.

An individual's knowledge and cognitive aspects are the most dominant factors that shape a person's behavior (overt behavior). Individual behavior based on sufficient knowledge has been proven to be more likely to be carried out continuously and sustainably. The improvement of cognitive aspects can be achieved through health education. Providing health education is part of caring for the survival of the next generation. Health education is a conscious and planned education aimed at creating opportunities for individuals to improve their literacy levels, and consistently develop their knowledge and skills in the health sector ([Timiyatun et al., 2021](#)). This is in line with the assessment results of this community service activity that the health education provided influences the increase in participants' knowledge. The average post-test scores of the participants showed an improvement compared to the average pre-test scores. The community service activity being conducted combines several methods, namely the delivery of material, discussions, and interactive question-and-answer sessions. In the research by [Ifroh and Ayubi \(2018\)](#) cited in [Timiyatun et al \(2021\)](#), health education that employs discussion methods is

more likely to enhance the knowledge and understanding of the participants. The community service activity aimed at increasing the understanding of preeclampsia among midwives and doctors at the community health center has shown positive results. This is reflected in the results of the pre-test and post-test, which showed an average increase of more than 50 percent. This indicates that the material provided on preeclampsia was well received by all participants in the activity.

In addition to focusing on the health of pregnant women, efforts to eliminate preeclampsia to reduce maternal mortality should also involve collaboration across various sectors. Cross-sector collaboration can be realized through several approaches, including identifying and analyzing science-based solutions, enhancing the efficacy of interventions related to preeclampsia research, integrating local and global knowledge in national and transdisciplinary research interventions, developing evidence-based SOP recommendations to optimize practices, policies, and management of preeclampsia, and strengthening multidisciplinary collaborative communication by prioritizing maternal health aspects comprehensively (Koi-Larbi et al., 2024). Based on the description, this community service activity is a form of cross-sector collaboration between health education institutions, health agencies, academics, and health providers.

4. CONCLUSION AND RECOMMENDATIONS

There has been an increase in knowledge and understanding among midwives and doctors, particularly regarding follow-up actions in Primary Health Care Facilities and Advanced Referral Health Facilities for cases of preeclampsia after participating in community service activities titled "Empowerment by Enhancing the Knowledge of Community Health Center Provider Regarding the Risks of Preeclampsia". This was conducted through methods of material presentation, discussion, and interactive question-and-answer sessions. The results of the quantitative evaluation are indicated by an increase in the average scores of the pre-test and post-test.

Although the program implementation does not have significant obstacles, there are limitations in its implementation, including: (1) This program has not involved independent midwives or private midwives practice, even though the findings of preeclampsia are not only within the scope of the Community Health Center; (2) Differences in the level of education and experience of health workers can affect the understanding and application of training results in daily clinical practice; (3) Not all health workers can consistently apply new knowledge in screening and risk management of preeclampsia; (4) Although health workers have been equipped with the knowledge, its application also depends on the awareness and compliance of pregnant women in undergoing routine examinations; (5) Cultural, economic factors, and limited access to health services are still obstacles in increasing the detection and prevention of preeclampsia at the community level. So, to overcome these limitations in the effort to eradicate preeclampsia, then: (1) Conduct routine and practice-based training with interactive methods such as case simulations, group discussions, and periodic evaluations to ensure that health workers' understanding increases; (2) Implement a mentoring or assistance system by more experienced medical personnel so that the application of knowledge in the field is more effective; (3) Involve the independent midwives and private midwives practice in further training activities not only midwives in Community Health Center; (4) Develop educational programs for pregnant women through pregnancy classes, community counseling, and social media to increase awareness of the importance of early detection of preeclampsia; (5) Increase access to health services, such as mobile examinations in remote areas or telemedicine services for preeclampsia risk consultations for pregnant women who have difficulty reaching health facilities.

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