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Pregnant women's knowledge of obstetric danger signs and health-seeking behavior in developing countries: A scoping review

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Abstract--To determine the evidence-based relationship between pregnant women's knowledge of obstetric danger signs and health-seeking behavior in developing countries. This review used the Prisma-ScR checklist. The review focused on searching articles in databases (PubMed and Science Direct), to find relevant articles published in 2015-2025 with the keywords used (pregnant women, knowledge, awareness, pregnancy danger signs) with the framework used for this review is PICO. There were 395 articles found and sorted based on inclusion and exclusion criteria, resulting in 16 articles used in this study. Furthermore, this study used a five-step framework adapted from Arksey and O'Malley to extract data, as well as compile, summarize and report the results. The results of the study found 16 studies that met the inclusion criteria. The study showed that the majority of respondents knew at least one obstetric danger sign during pregnancy, namely bleeding. The determining factors are higher educational status, more pregnancy experience, more frequent ANC visits, and delivery in a health facility. The implementation of integrated efforts is expected to increase mothers' knowledge about

obstetric danger signs, awareness and attitudes towards health services in health facilities, thereby providing safer and more beneficial delivery options for mothers and babies.

Keywords---Awareness, Maternal health, Maternal mortality rate, Obstetric danger signs, Actions to seek health assistance

Introduction

The Maternal Mortality Rate (MMR) is one of the women's health indicators of the third Sustainable Development Goal (Getachew et al., 2022). In 2023, an estimated 260,000 women will die from complications related to pregnancy or childbirth worldwide, which equates to one death every two minutes. Approximately 92% of all maternal deaths occur in low- and lower-middle-income countries. Sub-Saharan Africa and South Asia account for approximately 87% of the estimated global maternal deaths in 2023 (WHO, 2025). According to a new study by the World Health Organization (WHO), severe bleeding and hypertensive disorders such as preeclampsia are the leading causes of maternal death worldwide. These conditions, where bleeding is responsible for approximately 27% (approximately 80,000 deaths in 2020) of maternal deaths and is the leading cause, often occurring after childbirth. Hypertensive Disorders (e.g., preeclampsia) is the second leading cause, responsible for approximately 16% (approximately 50,000 deaths in 2020) of deaths (WHO, 2025).

Preeclampsia is a serious condition characterized by high blood pressure that can lead to hemorrhage, stroke, organ failure, and seizures if left untreated or treated too late. Other direct causes include: sepsis and infection; pulmonary embolism; complications from spontaneous and induced abortions, including miscarriage, ectopic pregnancy, and problems related to unsafe abortions; and complications from anesthesia and injuries sustained during delivery (Yuriah et al., 2022). In addition to outlining the main direct obstetric causes, the study showed that other health conditions, including infectious and chronic diseases such as HIV/AIDS, malaria, anemia, and diabetes, underlie nearly a quarter (23%) of pregnancy- and childbirth-related deaths (Yuriah, 2024). These conditions, which often go undetected or untreated until major complications develop, exacerbate risks and complicate pregnancies for millions of women worldwide (WHO, 2025).

To avoid maternal mortality, prevention of unwanted pregnancies is very important. Women's ability to identify danger signs during pregnancy and seek health care plays a key role in preventing and reducing maternal morbidity and mortality (Getachew et al., 2022). Lack of knowledge about obstetric danger signs during pregnancy contributes to delays in seeking or receiving quality care resulting in maternal death (Sadore, 2023) Three phases of delay in accessing obstetric services have been identified: delay in deciding to seek care; delay in reaching a health facility; and delay in receiving appropriate care after reaching a health facility (Yosef, 2021).

Knowledge of pregnancy danger signs is an important first step in receiving appropriate and timely referral to obstetric care (Gesese et al., 2023). Health-

seeking behavior of pregnant women is highly dependent on their knowledge of pregnancy danger signs (Sadore, 2023). This helps in decision-making about seeking health care in case of complications, which is crucial for achieving Sustainable Development Goal 3 (SDG 3); reducing the global maternal mortality rate to less than 70 per 100,000 live births by 2030 (Yuriah & Kartini, 2022).

Maternal awareness of obstetric danger signs in developing countries is relatively low despite numerous local and national programs. Obstetric danger signs can be addressed through education and awareness-raising efforts (Mgawadere et al., 2017). Inseparable from efforts to increase knowledge, it is necessary to understand how various communities utilize health care facilities according to their level of awareness (Maseresha et al., 2016). Low ANC visits at health facilities affect the level of awareness of obstetric danger signs which then increases the MMR rate (Dominique et al., 2019). Maternal awareness of obstetric danger signs is an integral part of knowledge, which refers to the extent to which a pregnant woman is able to utilize her knowledge of the signs and symptoms of potential complications during pregnancy, labor, and the postpartum period (Dwi et al., 2020). With this information, she is better prepared to anticipate potential problems and seek timely medical attention, which can reduce the risk of maternal and neonatal morbidity and mortality (Article et al., 2021).

Furthermore, some mothers in developing countries report the need to consult with family to access health care. This, coupled with a lack of medicines and equipment, the unavailability and long queues for health services, combined with a lack of quality, resources, and access to health services, coupled with low maternal awareness, education, income, and family factors, pose barriers to maternal well-being (Onchonga et al., 2021). The purpose of this study is to compile recent empirical studies describing pregnant women's knowledge of obstetric danger signs and their health-seeking behavior in developing countries. This will allow for greater focus on ensuring access to high-quality, proven-effective care for women by 2025, five years from the Sustainable Development Goals deadline.

Method

The identification process used PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) (Nursalam, 2020). This review aims to answer the following questions:

- 1) What is the current empirical data regarding pregnant women's awareness of obstetric danger signs in developing countries?
- 2) What are the determining factors of awareness?
- 3) What are effective strategies to raise awareness in developing countries?

This review was designed to gather all relevant literature emphasizing the topic of women's knowledge of pregnancy danger signs. Broad keywords were used to find as many relevant results as possible. The explored studies must meet the following inclusion criteria: a) studies involving pregnant women of all ages and parities, b) conducted in developing countries, c) original research methods with quantitative and qualitative methods, d) selection of articles limited to articles published in English and Indonesian. Some retrieved literature was excluded

because it was a review article and reports, opinion papers. The literature search used articles from 2015-2025 with PubMed, ScienceDirect, and Google Scholar databases. The article search was conducted in September 2025. The search terms were based on the PICO framework, namely Patient: (Mother OR Woman), Interest: (Knowledge) AND (Awareness), AND (pregnancy danger signs OR danger signs during pregnancy). Furthermore, articles were screened for article content, population suitability, methods, and results. Articles deemed high quality were included to be used for the scoping review.

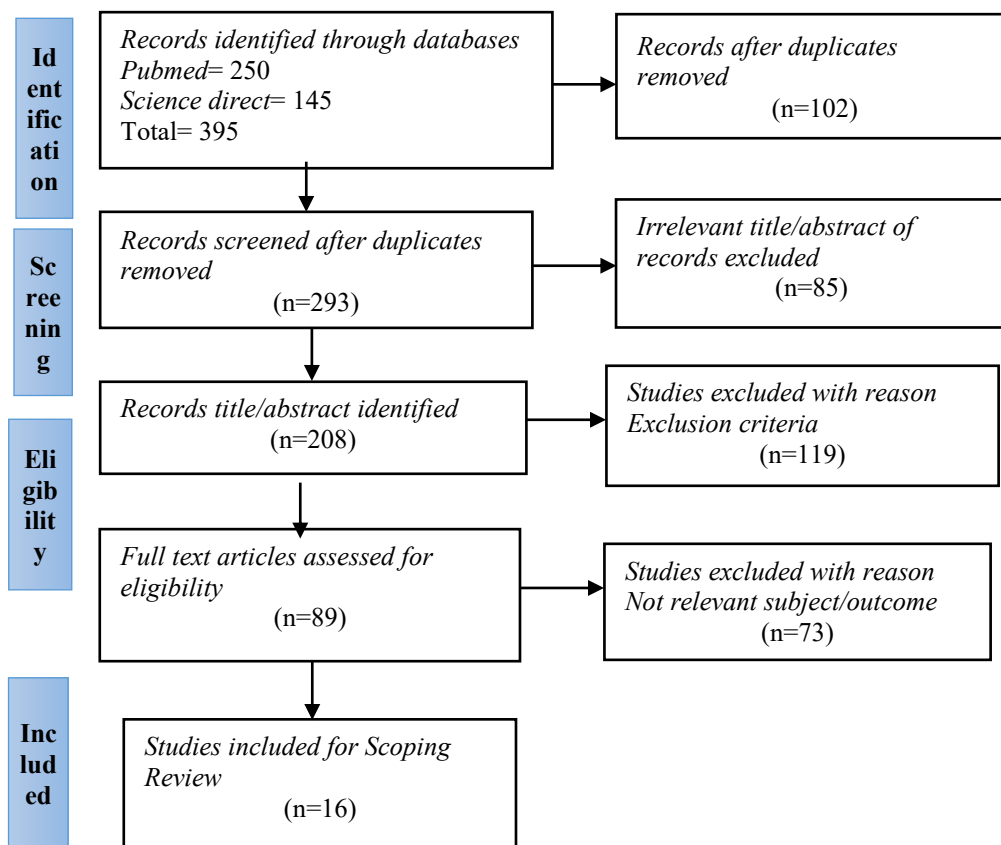


Figure 2.1. Prisma Flow Chart

Table 2.1 Data Charting

No	Author/ Year	Country	Sample	Results
1	(Yosef, 2021)	Ethiopia	526 women	The proportion of mothers with good knowledge of pregnancy danger signs was 43.2%. The majority of them cited vaginal bleeding as a danger sign. Factors associated with good knowledge of pregnancy danger signs were a husband with a secondary or higher education, a monthly income, and a

No	Author/ Year	Country	Sample	Results
2.	(Getachew et al., 2022)	Ethiopia	395 pregnant women	high school diploma. ≥ 1000 Ethiopian Birr, multigravida, and last delivery in a health facility. The proportion of mothers who experienced pregnancy danger signs and had good health care-seeking behavior was 72.7%. Respondents recalled at least one pregnancy danger sign, as many as 58.0%. Residence, distance to health facilities, and income were found to be significantly associated with mothers' knowledge of pregnancy danger signs.
3.	(Asferie, 2022)	Ethiopia	340 pregnant women	Women's knowledge score regarding pregnancy danger signs was 74.4%. Age, religion, educational status, family size, and antenatal care follow-up were identified as predictors of knowledge regarding pregnancy danger signs.
4.	(Nyirenda et al., 2025)	Zambia	562 pregnant women	The score of women's knowledge about danger signs of pregnancy is 35%. In this study, factors associated with adequate knowledge of danger signs included a history of stillbirth, previous delivery at a health center/post, religion, use of taxis/buses to reach health facilities, and uncertainty about travel time to the facility.
5.	(Koovimon et al., 2023)	Thailand	415 pregnant women	A total of 66.27% had good knowledge of obstetric danger signs. The most recognized obstetric danger sign was vaginal bleeding, while the least recognized during pregnancy was seizures, and during labor and delivery, placental retention. Multivariate regression analysis showed that predictive factors for good knowledge of obstetric danger signs included a higher level of education, maternal age at least 20 years, and having a medical professional as a source of knowledge.
6.	(Town & Zone, 2023)	Ethiopia	410 pregnant women	The prevalence of good knowledge of pregnancy danger signs was 63.2%. The most commonly recognized danger signs during pregnancy were heavy vaginal bleeding followed by blurred vision. In multivariable analysis, respondent age, maternal education, and number of live births were among the statistically significant factors.
7.	(Ramazani et al., 2023)	Congo	624 pregnant women	Knowledge of obstetric danger signs among pregnant women is low at 21.9%. The most frequently mentioned danger signs during pregnancy, labor, and postpartum include

No	Author/ Year	Country	Sample	Results
8.	(Sadore, 2023)	Ethiopia	668 pregnant women	severe abdominal pain and heavy vaginal bleeding. Furthermore, pregnant women aged 30–39 and multitravid mothers are more likely to be aware of obstetric danger signs. Only 22.9% knew what obstetric danger signs were. Maternal age, education, and parity were factors that influenced knowledge of obstetric danger signs. Perception of pregnancy risk and parity were significantly associated with attitudes toward using skilled medical personnel for delivery services.
9.	(Gesese et al., 2023)	Ethiopia	414 pregnant women	This study identified that 57.2% of pregnant women had good knowledge of pregnancy danger signs. Pregnant women aged ≥30 years, mothers living in urban areas, secondary education level and above, working mothers, multigravida, knowing that pregnancy danger signs can cause serious complications, knowing what to do if facing pregnancy danger signs, knowing when to go to a health facility if facing pregnancy danger signs and facing at least one pregnancy danger sign in pregnancy, were significantly associated with knowledge of pregnancy danger signs.
10.	(Ossai et al., n.d.)	Nigeria	660 pregnant women	The most frequently recalled danger sign was bleeding before delivery in urban (84.8%) and rural (80.9%) areas. Predictors of good knowledge of danger signs included living in an urban area, being <30 years old, and having 2-4 children.
11.		Kenya	275 pregnant women	Most women demonstrated a high level of knowledge regarding obstetric danger signs, with 80% recognizing these signs during pregnancy and 69.1% during labor. However, despite this awareness, overall Birth Readiness and Complication Readiness (BPCR) remained low, at only 28%.
12.	(Dwi et al., 2020)	Indonesia	85,832 women	Determinants of knowledge about pregnancy danger signs in Indonesia include residence, age, education, occupation, marital status, wealth, parity, health autonomy, current pregnancy status, and media exposure.
13.	(Id et al., 2025)	Ethiopia	1140 women	The proportion of women with knowledge of obstetric danger signs was 22.3%. Women working in government, women exposed to mass media, women who had received family training, and independent women. Women who had experienced health problems during

No	Author/ Year	Country	Sample	Results
14.	(Hospital et al., 2021)	Cameroon	532 pregnant women	pregnancy and urban women were the determining factors that positively influenced knowledge. There was a statistically significant association between older women, employed women, education level, parity, first trimester antenatal visits, and number of antenatal visits. Multiparous women were more likely to be aware of obstetric danger signs. The most frequently reported danger signs were heavy vaginal bleeding, fever, and decreased fetal movement.
15.	(Bhavana et al., 2024)	India	490 pregnant women	Of the 490 respondents, the majority correctly identified pregnancy bleeding, discharge, and swelling as danger signs. Approximately 56.5% had good knowledge of the danger signs. Knowledge was significantly higher among women aged 25 years and older, literate women, and those who received counseling during ANC and PNC. Qualitative findings revealed gaps in memory, poor understanding of symptoms, and sociocultural barriers to seeking care.
16.	(Alshaikh et al., 2023)	Saudi Arabia	400 pregnant women	Nearly 70.8% of participants received health information about obstetric danger signs. The primary sources of information were the internet, family, relatives or friends, and healthcare providers. The highest number of participants' responses regarding obstetric danger signs related to heavy vaginal bleeding, cramps, and decreased fetal movement. The proportion of participants with poor knowledge was influenced by their education level, those without children, and those who had not received previous information.

Results and Discussion

Results

Characteristics

Of the 395 articles collected in the literature search, 102 articles were removed due to duplication, 85 articles were removed due to irrelevant titles and abstracts, 119 articles were removed due to not meeting the inclusion criteria, 89 full articles were read and eligibility criteria were applied, resulting in 16 articles being included in the review (Figure 2.1). An overview of the main characteristics found in the 16 included articles is described in Table 2.1. All studies were

conducted in developing countries, mostly from Africa (Ethiopia, Nigeria, the Republic of Congo, Zambia, Kenya, and Cameroon), and the rest from Asia (Thailand, Indonesia, India, and Saudi Arabia). The research articles were cross-sectional and some used secondary data, some community-based and some clinic- or hospital-based. All studies measured mothers' knowledge of obstetric danger signs, which consist of danger signs of pregnancy, labor, and postpartum. The number of respondents from all articles was approximately 93,683 women. Respondent characteristics were pregnant women consisting of primigravida and multigravida, mothers who gave birth within the past year (Yosef, 2021) and women of childbearing age (15-49 years) (Dwi et al., 2020). Meanwhile, the location of respondent recruitment was in the community or at a health facility, some respondents visited antenatal care (ANC) facilities at least once, some visited ANC services four or more times, some respondents are expected to have to walk for more than 30 minutes to reach the facility nearest health (Getachew et al., 2022; Gesese et al., 2023; Nyirenda et al., 2025).

Level of maternal awareness according to level of knowledge

In this measurement category there are many knowledge level values reported, for further details see Table 2.1. Further measurements The prevalence of knowledge and awareness of obstetric danger signs in developing countries is low to moderate, ranging from 21.9 to 74.4%. However, research in Ethiopia mothers who experienced signs of danger during pregnancy and had good health care seeking behavior were 72.7% (Yosef, 2021). Surprisingly based on research in Kenya Most women demonstrated a good level of knowledge regarding obstetric danger signs, with 80% recognizing these signs during pregnancy and 69.1% during labor. However, despite this awareness, overall Birth Readiness and Complication Readiness (BPCR) remained low, at only 28% .

The most well-known obstetric danger signs

Based on Table 2.1, the majority of those surveyed as danger signs during pregnancy, labor and post-labor mentioned vaginal bleeding, severe abdominal pain, blurred vision, fever, infection, decreased fetal movement, premature discharge of amniotic fluid, swelling of the feet and hands. while the least known is during pregnancy seizures; during labor and birth is placental retention (Yosef, 2021).

Determinants of knowledge of obstetric signs

Based on Table 2.1, the study revealed that predisposing factors (socio-demographic characteristics), supporting factors (facilitating individuals to use services such as the availability of resources such as income, availability and access to services), need factors (physical conditions, illnesses or medical conditions that motivate service use), and external factors influence the utilization of health services. The availability, affordability, and cultural acceptance of health services are factors that greatly influence the utilization of these services.

It was revealed that low risk awareness, inadequate infrastructure and transportation, poor quality of care, and lack of financial independence hinder easy access to obstetric care. Women's knowledge of pregnancy-related danger signs is influenced by various factors, including maternal age, occupation, education, marital status, husband's education and occupation, monthly income,

residence, family size, religion, gravidity, parity, antenatal care (ANC) visits and number of ANCs, place of delivery, previous birth companions, walking time to the health facility, health education, and information sources.

Discussion

Studies show that knowledge of the danger signs of pregnancy complications is an important first step in receiving appropriate and timely referral to obstetric care (Gesese et al., 2023). Health-seeking behavior of pregnant women is highly dependent on their knowledge of pregnancy danger signs (Sadore, 2023). Based on the facts above, Many studies aim to test awareness using knowledge as the criterion. Research conducted in Congo (21.9%) and Ethiopia (22.3%) showed that knowledge of obstetric hazards among pregnant women was lower (Ramazani et al., 2023). Compared to several studies conducted in Ethiopia, Zambia, Kenya, India, and Thailand, knowledge of pregnancy danger signs was categorized as moderate to good. The observed variation in results from one study to another may be due to differences in sample size, operational definitions used (most studies used two criteria, some used three, and others used four criteria, and so on) to express knowledge of PDS, and general methodology. Furthermore, the socioeconomic, cultural, and educational profiles of the study populations can create significant variation.

Surprisingly, the assumption that pregnant women have low awareness of obstetric danger signs in developing countries is partly untrue. Studies in several developing countries show that pregnant women have a good level of awareness, as evidenced by their ability to recall knowledge of obstetric danger signs (Yosef, 2021). In line with the results of several studies, the majority Those surveyed mentioned at least one obstetric danger sign, the highest being vaginal bleeding, and had the behavior of seeking health care when a danger sign occurred, around 72.7% (Yosef, 2021). A study in Kenya showed a high level of knowledge of obstetric danger signs, with 80% recognizing these signs during pregnancy and 69.1% during labor. However, despite this awareness, overall Birth Readiness and Complication Readiness (BPCR) remained low, at only 28% (Haryanti & Yuriah, 2025).

Many developing countries have addressed the gap in low obstetric danger sign awareness by increasing ANC facilities and improving their quality, but evidence on the adequacy of resources in these facilities is beyond the scope of this review. The problem causing the high maternal mortality rate (MMR) in developing countries is not the ANC process; this review found that barriers to women seeking prompt medical care when obstetric danger signs appear are a contributing factor to the high MMR rate . Barriers such as family problems in taking action for mothers who are aware when danger signs appear, the distance to service facilities, are practically the most overlooked factors during ANC visits (Getachew et al., 2022). ANC visits focus on pregnancy health, increasing knowledge, and provide medication or vitamins to improve pregnancy health (Salem et al., 2018).

Surprisingly, education and economic status did not play a major role in maternal awareness (Sadore, 2023). However, some studies suggest that the better education and economic status, the better the mother's ability to remember

information (Yosef, 2021). This may be due to the educational factor due to the high tendency where mothers and husbands who are highly educated can more easily understand the danger signs and are not illiterate and husbands can understand their wives better (Bhavana et al., 2024). This is also in line with better incomes associated with higher purchasing power obtained through television and radio, as obtaining information from mass media is an important factor contributing to the development of good knowledge (Dwi et al., 2020).

However, the case of obstetric danger signs awareness is different. It's not about internal characteristics of the mother, but more about the social support and health education that the mother may receive during the visit (Bhavana et al., 2024; Hospital et al., 2021; Id et al., 2025). Programs for pregnant and postpartum women, including the services they receive, are provided free of charge by many developing countries from national or international support (Article et al., 2021)(Dominique et al., 2019). In Indonesia, there is a national health insurance program - the Indonesian Health Card (JKN-KIS) organized by BPJS Kesehatan, which covers various obstetric services, including childbirth, which are accessed free of charge for active participants who follow the applicable procedures (BPJS Health, 2021).

Perception of pregnancy risk (AOR = 14.7, CI: 9.849–22.235) and parity (AOR = 2.27, CI: 1.381–3.733) were significantly associated with attitudes towards the use of delivery services by trained medical personnel (Sadore, 2023). Recommendations for clinical practice to increase maternal awareness of obstetric danger signs is to increase the effectiveness of health education during ANC (Bhavana et al., 2024; Hospital et al., 2021). Respondents who had had more than one pregnancy and women who had experienced a stillbirth had better knowledge of obstetric danger signs compared to those who were pregnant for the first time (Awaliyah & Yuriah, 2024). Having more than one pregnancy was significantly associated with good knowledge of obstetric danger signs. This finding is consistent with research conducted in various developing countries (Town & Zone, 2023; Ramazani et al., 2023; Nyirenda et al., 2025).

In line with research, respondents who gave birth in health facilities were more likely to have good knowledge of obstetric danger signs than those who gave birth at home (Yosef, 2021). Giving birth in a health facility is strongly associated with good knowledge of obstetric danger signs. This is likely because mothers with multiple pregnancies and mothers who give birth in a health facility may receive repeated exposure to obstetric danger signs education during each antenatal care (ANC) visit (Bhavana et al., 2024). There must be a clear strategy to convey all obstetric danger sign information, especially to mothers with high risk factors (Koovimon et al., 2023).

Research in Ethiopia said the proportion of mothers who had knowledge about pregnancy and experienced pregnancy danger signs and had good health care seeking behavior was 72.7% (Yosef, 2021). The Maternal and Child Health (MCH) handbook is a medium good for information transfer (Dominique et al., 2019). This book is part of integral part of the medical record. Medical records are only available to health care providers, but the Maternal Health Handbook and Child (KIA) is available for both parties, mothers and service providers. health, even

families can access this book. This can provide information to families regarding findings during prenatal check-ups (ANC). This will increase mothers' knowledge about the signs danger, including family (Mwilike et al., 2018)(Tamang et al., 2021). Pimplement or share experiences of using the KIA Handbook to monitor maternal and child health, making it an international standard in many developing regions (Juniarti et al., 2024).

Mother in the country developing reports that awareness begins from their household in the form of spousal support or family regarding their pregnancy. Book Maternal and Child Health (MCH) guidelines will make it easier delivery of information to families, especially to father, head of the family, or dominant elder (Mwilike et al., 2018) (Tamang et al., 2021). This can help the mother to seek medical care if any problems arise dangerous signs and symptoms. In addition, the application ANC supporters such as mhealth (mobile health) can be an alternative (Alshaikh et al., 2023). So that the information related to the health of pregnant women can be broader and increase the involvement of younger pregnant women.

ANC clinics are ideal places to provide education. health, but the efficiency of ANC clinics may be hampered by constraints that mothers face in seeking medical help (Sadore, 2023). Evaluation regarding the obstacles in seeking health services should be part of the ANC program. Mothers need to be encouraged to express barriers to seeking health services. Nurse or officer other health professionals should help mothers find solutions to obstacles. certain. The nurse's care plan includes family interventions. Nurses need to deal with family problems related to search for maternal health services. This review suggests developing countries to begin incorporating barrier assessments into their seeking health services and using the Maternal Health guidebook and Children (KIA) into the Antenatal Care (ANC) program.

Conclusion

Empirical data on pregnant women's awareness of obstetric danger signs in developing countries is low to moderate. Only a handful of developing countries have relatively good awareness, which is related to the determinants of this awareness. These factors include better education, better economic status, family support and health autonomy, more pregnancy experience, more frequent ANC visits, and delivery at a health facility. An effective strategy recommended to strengthen women's awareness is to eliminate barriers to seeking health services, especially at the household level. Assessing barriers to seeking health services should be part of ANC programs. Barriers to seeking health services are unique to developing countries. Most are related to family support, namely from husbands and parents, economic factors, and distance to service facilities. The use of JKN-KIS, which provides free health services, a Maternal and Child Health (MCH) guidebook, or a mobile application to record ANC visits, is also useful for communicating with families and can be an effective solution, providing safer and more beneficial delivery options for mothers and babies, and achieving the third Sustainable Development Goal (SDG) by 2030.

Conflict of interest statement

The authors declared that they have no competing interests.

Statement of authorship

The authors have a responsibility for the conception and design of the study. The authors have approved the final article.

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