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Article

Knowledge and Determinants of Obstetric Danger Signs Among Pregnant Women: A Cross-Sectional Study

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ABSTRACT
Background: The maternal mortality rate reflects the risk of maternal death during pregnancy, childbirth, and the postpartum period per 100,000 live births. A woman's knowledge of obstetric danger signs plays a critical role in her ability to recognize complications early and seek timely medical intervention. This study aimed to identify the factors influencing pregnant women's knowledge of obstetric danger signs.
Methods: A cross-sectional quantitative study was conducted in Indonesia between May and August 2022 using an online survey. Participants were pregnant women who owned smartphones and provided informed consent. A total of 176 respondents were included. Data were collected using a structured questionnaire that assessed sociodemographic characteristics (age, education, occupation, distance to health facilities), obstetric history (parity, gestational age, antenatal visits), sources of information, and knowledge of obstetric danger signs, measured using the Birth Preparedness and Complication Readiness (BPCR) tool. Multivariate analysis was conducted using linear regression with a significance level set at $p < 0.05$.
Results: The majority of participants (57.9%) demonstrated good knowledge of obstetric danger signs, while 41.7% had poor knowledge. Age, occupation, gestational age, and antenatal visits were not significantly associated with knowledge levels. However, educational attainment, parity, proximity to health facilities, and access to information sources were significantly related to knowledge of obstetric danger signs ($p < 0.05$).
Conclusion: A substantial proportion of pregnant women still lack adequate knowledge of obstetric danger signs. Therefore, it is crucial for nurses and other healthcare providers to intensify educational efforts and promote regular antenatal care to improve maternal awareness and reduce maternal morbidity and mortality.

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INTRODUCTION

Pregnancy remains a significant public health challenge, particularly in developing countries, where maternal mortality is unacceptably high. An estimated 529,000 women die each year from pregnancy-related causes, and 99% of these deaths occur in low- and middle-income countries (Tura, 2019). The maternal mortality rate (MMR)—defined as the number of maternal deaths per 100,000 live births—serves as a key indicator of maternal health. In Indonesia, MMR has increased, with 684 reported deaths in 2021, compared to 623 in 2019. The primary causes included hemorrhage (27.92%), hypertensive disorders of pregnancy (28.86%), infections (3.76%), cardiac disorders (10.07%), metabolic complications (3.49%), and other causes (25.91%) (Dinas Kesehatan, 2021).

One of the major contributors to maternal mortality is the "three delays": delay in recognizing danger signs and deciding to seek care, delay in reaching a healthcare facility, and delay in receiving adequate treatment upon arrival (Fibriana & Azam, 2019). In addition to these delays, maternal deaths may also be influenced by the "4 Too" risk factors: becoming pregnant too young (under 20 years), too old (over 35 years), too frequently (birth intervals of less than two years), or having too many children (more than three or four). These conditions increase the risk of pregnancy-related complications and maternal death (Wahyuni & Puspitasari, 2021).

Knowledge plays a critical role in maternal health outcomes. It is the result of sensory experiences and cognitive processing, and significantly influences a woman's decisions during pregnancy (Donsu, 2017). According to a study by Tamang et al. (2021), only 4.7% of women had adequate knowledge of obstetric danger signs, while 58.1% had moderate knowledge and 37.2% had poor knowledge (Supriatin, 2025). Awareness of obstetric danger

signs helps pregnant women recognize early complications and seek timely medical attention, thus preventing severe outcomes (Mwilike et al., 2018; Rusmita & Barokah, 2019).

Several factors have been found to influence maternal knowledge of obstetric danger signs. Age is one such factor, with studies indicating that younger women tend to have less awareness compared to older women (Teshoma Regasa et al., 2020). Education level also plays a crucial role; women with higher education are more likely to have good knowledge compared to those with only primary or no formal education (Kurniawati & Nurdianti, 2018). Sources of information further impact knowledge. Pregnant women with good awareness often receive information from healthcare professionals, mobile applications, and the internet, while those with poor awareness rely predominantly on the internet, often without guidance (Sulistianingsih, 2018).

Parity is another associated factor. Women with higher parity tend to have greater knowledge of obstetric danger signs than nulliparous or primiparous women (Kusumastuti, 2018; Budiarti et al., 2018). These findings highlight the importance of experience, repeated exposure to antenatal services, and interactions with health workers in building knowledge (Istiqomah, 2022).

Given the persistent challenges in reducing maternal mortality and the critical role of early recognition of complications, this study aims to explore factors associated with pregnant women's knowledge of obstetric danger signs. These include socio-demographic characteristics such as maternal age, occupation, education level, and proximity to health facilities, as well as obstetric variables including parity, gestational trimester, and antenatal care (ANC) visits. The study also investigates the impact of information sources. Understanding these factors is essential for designing targeted educational interventions and strengthening maternal health programs to ensure early detection and response to obstetric complications.

METHODS

An institutional- based quantitative cross-sectional study was employed. The study was conduted in Indonesia from May-Agustus 2022 by online. The independent variables are ages, educational backgrounds, occupations, distances from home to health facilities, antenatal visits, parity, trimester or gestational ages, and information sources. The thing that matters is how much you know about warning signs. The people in this study are women who are pregnant. Women who are pregnant in their first, second, or third trimesters, have smartphones, and are willing to take part in the study are eligible. In this study, 176 people are used as samples. Sample size was decided with the help of the software G power 3.1.9.7 and the F test. Linear multiple regression: Fixed model, R2 deviation from zero with 0.05, effect size f2 0.15, Power (1- err prob) 0.95, and 8 predictors with a 10% attrition rate.

The instruments are quesstionaires of ages, educational backgrounds, occupations, distances from home to health facilities, antenatal visits, parity, trimester or gestational ages, information sources, and knowledge of danger signs is measured by Birth Preparedness And Complication Readiness tools atau BP/CR tools from JHPIEGO/ Maternal and Neonatal Health Program with 9 questions (JHPIEGO, 2004). The BP/CR Tools are measured by two answers choices. If the participant answer "yes", it is considered as the correct answer, while the answer "no" is considered as the wrong answer. Total knowledge score, with one point (1) for each correct response and no point (0) for incorrect responses. The average knowledge score was calculated. This average value is used to categorize the knowledge level of participants into two groups, namely good knowledge and poor knowledge. participants who got an average score and above the average score were considered as good knowledge, less than the average score were classified as lack of knowledge (Haleema et al., 2017).

Data were edited and cleaned before being analyzed; each questionnaire was checked for completeness and a code was assigned before data entry; and the analysis was performed using SPSS Version 24.0. The study variable was described using univariate analysis using frequency, percentage, and descriptive summaries. The bivariate analysis included the spearman test for age, educational background, gestational age, and information sources, as well as the independent t-test for occupation, distance from home to health facilities, parity, and antenatal visits. Linear

regression is used in the multivariate analysis. Significant associations were defined as adjusted odds ratios with 95% confidence intervals and p-values less than 0.05.

RESULT

A total of 176 pregnant women were included in this study. The majority of participants (67.2%) were between 20 and 35 years old. Most had completed senior high school (35.0%) and were employed (51.1%). Slightly over half (53.3%) required 30 minutes or more to reach a health facility. The majority (92.8%) had attended at least one antenatal care (ANC) visit, 52.8% were multigravida, and 50% were in their second trimester.

Table 1. Characteristics of pregnant women in the study (n = 176)

Variable	Category	Frequency	Percentage (%)
Age (years)	< 20	34	18.9
	20–35	121	67.2
	> 35	25	13.9
Educational background	No formal education	5	2.8
	Elementary school	40	22.2
	Junior high school	46	25.6
	Senior high school	63	35.0
	Higher education (Bachelor+)	26	14.4
Occupation	Unemployed	88	48.9
	Employed	92	51.1
Time to health facility	< 30 minutes	84	46.7
	≥ 30 minutes	96	53.3
ANC visit (at least once)	Yes	167	92.8
	No	13	7.2
Parity	Primigravida	85	47.2
	Multigravida	95	52.8
Gestational trimester	First trimester	42	23.3
	Second trimester	90	50.0
	Third trimester	48	26.7

Participants reported various sources of information about obstetric danger signs. The internet was the most frequently cited source (22.8%), followed by health workers (20.6%). Notably, 16.1% of participants had never received information from any source.

Table 2. Sources of information about obstetric danger signs (n = 180)

Source of Information	Frequency	Percentage (%)
None / never received information	29	16.1
Health workers	37	20.6
Family	32	17.8
Mother and Child Health Book	35	19.4
Mass media (TV, radio, etc.)	3	1.7
Audiovisual media	3	1.7
Internet	41	22.8

Knowledge of obstetric danger signs was assessed using the Birth Preparedness and Complication Readiness (BP/CR) tool. The mean knowledge score was 5.54 (SD = 2.97), with scores ranging from 0 to 9. Participants with scores ≥5.54 were categorized as having good knowledge.

Table 3. Knowledge level about obstetric danger signs among pregnant women (n = 180)

Category	Frequency	Percentage (%)
Good (≥ 5.54)	105	58.3

Category	Frequency	Percentage (%)
Poor (< 5.54)	75	41.7

Mean score = 5.54; SD = 2.97; Minimum = 0; Maximum = 9

Bivariate analysis revealed significant associations between knowledge of obstetric danger signs and several variables, including age, education, gestational age, sources of information, occupation, distance to health facility, antenatal visits, and parity.

Table 4. Bivariate analysis of factors associated with knowledge of obstetric danger signs (n = 176)

Variable	Correlation Coefficient / t-value	p-value
Age[a]	0.400	0.000
Education[a]	0.631	0.000
Gestational age[a]	0.204	0.006
Sources of information[a]	0.400	0.000
Occupation[b]	-7.826	0.000
Time to health facility[b]	-5.125	0.000
Antenatal care visits[b]	-5.002	0.000
Parity[b]	-4.219	0.000

[a] Spearman correlation test

[b] Independent t-test

Multivariate linear regression analysis identified education (p = 0.003), time to health facility (p = 0.003), parity (p = 0.000), and sources of information (p = 0.005) as significant predictors of knowledge about obstetric danger signs.

Table 5. Multivariate linear regression analysis of factors associated with knowledge of obstetric danger signs (n = 176)

Variable	t-value	p-value
Age	1.880	0.062
Education	3.057	0.003
Occupation	1.917	0.057
Time to health facility	-3.022	0.003
Parity	3.669	0.000
Gestational age	-0.104	0.917
Antenatal care visits	-0.272	0.786
Sources of information	2.872	0.005

The final regression model yielded an R value of 0.756, indicating that the combination of significant predictors explained 75.6% of the variation in knowledge scores among pregnant women.

DISCUSSION

In this study, 105 out of 180 pregnant women (58.3%) demonstrated good knowledge of obstetric danger signs. This finding aligns with national data, which reported that 56.6% of pregnant women in Indonesia had adequate knowledge in this area (Wulandari & Laksono, 2020). The most commonly identified danger sign during pregnancy was heavy vaginal bleeding, reported by 96.1% of respondents. Conversely, the least recognized danger sign was blurred vision (21.1%). During labor, heavy bleeding remained the most frequently mentioned danger sign (97.2%), while severe headache was the least acknowledged (25.0%). In the immediate postpartum period (within two days after delivery), heavy bleeding was again the most recognized sign (96.1%), whereas only 23.9% of respondents identified swollen hands or face as a danger sign. Regarding neonatal danger signs in the first seven days after birth, difficulty or rapid breathing was recognized by 96.7% of respondents.

The high recognition of heavy bleeding in this study exceeds previous findings, such as a study by Jewaro et al. (2020), where vaginal bleeding was reported by 64.7% of respondents. The increased recognition in the present

study may be attributed to variations in health education efforts by healthcare providers. These findings are also consistent with research by Woldeamanuel et al. (2019), which reported that bleeding was the most frequently identified danger sign during pregnancy (72.6%), childbirth (65.9%), and the postpartum period (76.4%).
Knowledge is a foundational element in promoting health-seeking behavior. Without sufficient knowledge, individuals may lack the ability to make timely and informed decisions regarding complications during pregnancy and childbirth (Irwan, 2017). In this study, many respondents were able to mention at least three danger signs during pregnancy, childbirth, postpartum, and neonatal periods, indicating satisfactory knowledge. However, a substantial proportion still demonstrated limited understanding, which could be influenced by educational background, parity, sources of information, and other contextual factors.

Mobile phones, internet platforms, and applications emerged as the primary sources of information in this study, reported by 23% of respondents. This is consistent with findings by Sulistianingsih (2018), who reported that 43% of respondents relied on the internet for maternal health information. Access to diverse information sources, such as digital media, peer networks, printed materials, and audiovisual tools can significantly expand a person's knowledge base. With the proliferation of electronic devices and digital access, the internet has become an increasingly prominent medium for disseminating maternal health information (Pipitcahyani, 2018).
Multivariate analysis revealed that education was a dominant factor influencing knowledge of obstetric danger signs, with a statistically significant association ($p = 0.003$). This finding supports prior research showing a strong correlation between education level and maternal knowledge (Wulandari & Laksono, 2020). Higher educational attainment equips women with better comprehension and cognitive skills, enhancing their ability to absorb and apply health-related information.

The distance to health facilities was also significantly associated with knowledge levels ($p = 0.003$). This echoes previous studies indicating that proximity to health services improves access to health education and information, thus enhancing awareness (Hibstu & Siyoum, 2017). Women who live closer to health facilities tend to attend more frequent ANC visits and are more likely to receive counseling on danger signs.
Parity was another significant predictor ($p = 0.000$), with multigravida women demonstrating higher knowledge than primigravida women. This is consistent with the findings of Bolanko et al. (2021), who observed that women with previous pregnancy experiences are more familiar with potential complications, leading to greater awareness of obstetric danger signs.

Lastly, sources of information were found to significantly influence knowledge levels ($p = 0.005$). The increasing use of mobile technology and online platforms offers an accessible and efficient means for disseminating health education, especially among populations with limited access to formal healthcare services.

CONCLUSION

Overall, while more than half of the respondents demonstrated good knowledge of obstetric danger signs, the proportion remains suboptimal at 58.3%. Key determinants of knowledge in this population included education level, distance to health facilities, parity, and sources of information. To improve maternal outcomes, it is essential to strengthen health education strategies targeting pregnant women, particularly those with limited education, first-time mothers, and those living far from health services. Health professionals, especially nurses and midwives play a crucial role in promoting awareness by providing consistent, culturally appropriate, and technology-integrated education on obstetric danger signs. Increasing maternal knowledge through both conventional and digital health platforms will contribute to earlier recognition of complications and timely healthcare-seeking behavior, thereby reducing maternal and neonatal morbidity and mortality.

Conflict of Interest

The authors declare no conflict of interest.

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Data Availability Statement

The datasets generated and analyzed during the current study are not publicly available due to participant confidentiality but are available from the corresponding author on reasonable request.

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REFERENCES

Bolanko, A., Namo, H., Minsamo, K., Addisu, N., & Gebre, M. (2021). Knowledge of obstetric danger signs and associated factors among pregnant women in Wolaita Sodo town, South Ethiopia: A community-based cross-sectional study. *SAGE Open Medicine*, *9*, 205031212110011. https://doi.org/10.1177/20503121211001161

Budiarti, V., Putri, R., & Amelia, C. R. (2018). Hubungan Karakteristik Ibu dan Dukungan Suami dengan Tingkat Pengetahuan Ibu Hamil Tentang Tanda Bahaya Kehamilan. *Journal Of Issues In Midwifery*, *2*(1), 1–18. https://doi.org/10.21776/ub.joim.2018.002.01.1

Dinas kesehatan, J. B. (2021). Profil Kesehatan Indonesia 2020. In *Kementrian Kesehatan Republik Indonesia*.

Donsu, J. D. T. (2017). *Psikologi keperawatan : aspek-aspek psikologi konsep dasar psikologi teori perilaku manusia*. Pustaka Baru Press.

Fibriana, A. I., & Azam, M. (2019). Three delay model sebagai salah satu determinan kematian ibu di kabupaten cilacap. *Jurnal Kesehatan Masyarakat*, *14*(3), 404–409.

Haleema, M., Raghuveer, P., R, K., Mohammed, I. M., Mohammed, I. S. A., & Mohammed, M. (2017). Assessment of knowledge of obstetric danger signs among pregnant women attending a teaching hospital. *Journal of Family Medicine and Primary Care*, *6*(2), 169–170. https://doi.org/10.4103/jfmpc.jfmpc

Hibstu, D. T., & Siyoum, Y. D. (2017). Knowledge of obstetric danger signs and associated factors among pregnant women attending antenatal care at health facilities of yirgacheffe town, gedeo zone, southern ethiopia. *Archives of Public Health*, *75*(1), 1–9. https://doi.org/10.1186/s13690-017-0203-y

Irwan. (2017). *Etika dan Perilaku Kesehatan*. Absolute Media.

Istiqomah, W., & Fauzi, A. (2022). Effectiveness Of Beetroot And Spinach Against The Increase In Hemoglobin Levels Of Pregnant Women In The Primary Clinic Kasih Bunda, 2022. *Jurnal Keperawatan Komprehensif (Comprehensive Nursing Journal)*, 8(Special Edition).

Jewaro, M., Yenus, H., Ayanaw, Y., Abera, B., & Derso, T. (2020). Knowledge of obstetric danger signs and associated factors among mothers in Bahir Dar district, northwest Ethiopia: an institution-based cross-sectional study. *Public Health Reviews*, *41*(1), 1–8. https://doi.org/10.1186/s40985-020-00132-7

JHPIEGO. (2004). Maternal and neonatal health program birth preparedness and complication readiness: a matrix of shared responsibilities. *JHPIEGO:Maryland*.

Kurniawati, A., & Nurdianti, D. (2018). Karakteristik Ibu Hamil dengan Pengethuan dan Sikap Dalam Mengenal Tanda Bahaya Kehamilan. *Jurnal Bimtas*, *2*(1), 32–41.

Kusumastuti, I. (2018). Hubungan Karakteristik Ibu, Paritas dan Sumber Informasi dengan Pengetahuan Ibu tentang Tanda Bahaya Kehamilan. *Jurnal Ilmiah Kebidanan Indonesia*, *8*(03), 124–132. https://doi.org/10.33221/jiki.v8i03.158

Mwilike, B., Nalwadda, G., Kagawa, M., Malima, K., Mselle, L., & Horiuchi, S. (2018). Knowledge of danger signs during pregnancy and subsequent healthcare seeking actions among women in Urban Tanzania: A cross-sectional study. *BMC Pregnancy and Childbirth*, *18*(1), 1–9. https://doi.org/10.1186/s12884-017-1628-6

Pipitcahyani, T. I. (2018). Sumber informasi dan pengetahuan ibu hamil tentang tanda bahaya kehamilan, persalinan dan nifas. *Jurnal Pendidikan Kesehatan*, *7*(1), 47–52.

Rusmita, E., & Barokah, M. (2019). Pengetahuan Ibu Hamil Tentang Tanda Bahaya Kehamilan Di Praktek Bidan Mariani Ciumbuleuit Bandung. *Jurnal Kesehatan …*, 9–15.

Sulistianingsih, A. (2018). Sumber Informasi Yang Didapatkan Ibu Tentang Pengetahuan Tanda Bahaya Kehamilan Pada Ibu Hamil Di Wilayah Kerja Puskesmas Pringsewu. *Jurnal Ilmiah Kesehatan*, *7*(2), 60–66. https://doi.org/10.35952/jik.v7i2.121

Supriatin, S., Dioso, R. I., & Hassan, H. C. (2025). Exploring The Use Of Mobile Applications For Baby Massage Therapy: A Scoping Review. *Journal of Healthcare Technology ISSN XXXX-XXXX*, 2(1), 19-27.

Tamang, S. T., Dorji, T., Yoezer, S., Phuntsho, T., & Dorji, P. (2021). Knowledge and understanding of obstetric danger signs among pregnant women attending the antenatal clinic at the National Referral Hospital in Thimphu, Bhutan: a cross-sectional study. *BMC Pregnancy and Childbirth*, *21*(1), 1–9. https://doi.org/10.1186/s12884-021-03580-4

Teshoma Regasa, M., Markos, J., Habte, A., & Upashe, S. P. (2020). Obstetric Danger Signs: Knowledge, Attitude, Health-Seeking Action, and Associated Factors among Postnatal Mothers in Nekemte Town, Oromia Region, Western Ethiopia - A Community-Based Cross-Sectional Study. *Obstetrics and Gynecology International*, *2020*. https://doi.org/10.1155/2020/6573153

Tura, T. S. (2019). Assessment of Knowledge of Obstetric Danger Signs During Pregnancy Among Pregnant Mothers in Wolaita Sodo Hospitals and Sodo Town Health Centers in 2017. *Journal of Health, Medicine and Nursing*, *65*, 1–11. https://doi.org/10.7176/jhmn/65-01

Wahyuni, R. T., & Puspitasari, N. (2021). *Relationship between Mother ' s Status Too Young , Too Old , Too Close , Too Much (4T), and Contraceptive Use with Incidence of Maternal Mortality*. *13*(2), 92–97.

Woldeamanuel, G. G., Lemma, G., & Zegeye, B. (2019). Knowledge of obstetric danger signs and its associated factors among pregnant women in Angolela Tera District, Northern Ethiopia. *BMC Research Notes*, *12*(1), 8–13. https://doi.org/10.1186/s13104-019-4639-8

Wulandari, R. D., & Laksono, A. D. (2020). *Determinants of knowledge of pregnancy danger signs in Indonesia*. 1–11. https://doi.org/10.1371/journal.pone.0232550