JMCH Journal of Maternal and Child Health (2025), 10(04): 233-244
Masters Program in Public Health, Universitas Sebelas Maret

Original Research
Open Access

Family Role on the Pregnant Women's Knowledge Toward Obstetric Danger Signs

Rr. Novita Wahyu Handayani[1)], Ali Napiah Nasution[2)], Clarissa Lister[2)]

[1)]Postgraduate Master of Clinical Medicine, Faculty of Medicine, Dentistry and Health Science, Universitas Prima Indonesia, Medan
[2)]Faculty of Medicine, Dentistry and Health Science, Universitas Prima Indonesia, Medan

Received: 17 April 2025; Accepted: 8 May 2025; Available online: 16 July 2025

ABSTRACT

Background: Obstetric danger signs are an important indicator that pregnant women need to recognize to prevent complications and reduce maternal mortality. This study aims to analyze the determinants of knowledge about obstetric danger signs in pregnant women, with a special focus on the role of family function as measured by the family APGAR instrument.

Subjects and Method: A cross-sectional study was conducted on 48 pregnant women who visited the Padang Bulan Community Health Center, Medan, during August-September 2024. The dependent variable is the level of knowledge about obstetric danger signs. Independent variables were age, education level, employment status, number of pregnancies (parity), income, and family function (APGAR score). Data collection was conducted using questionnaires on obstetric danger signs and family APGAR instruments. Data analysis included univariate, bivariate (Chi-Square), and multivariate (logistic regression) analysis.

Results: The majority of subjects (72.9%) had good knowledge of obstetric danger signs. Bivariate analysis showed that education level (p=0.008) and family function (p=0.005) had a significant relationship with knowledge level, while age, employment status, parity, and income showed no significant relationship. Multivariate analysis confirmed that highly functional family function (OR= 10.47; 95% CI= 1.56 to 70.40; p =0.016) and higher education levels (OR= 6.83; 95% CI= 1.31 to 35.61; p = 0.023) were significant independent predictors for good knowledge of obstetric danger signs.

Conclusion: Family function and education level are the main determinants of pregnant women's knowledge about obstetric danger signs. Maternal health education programs need to consider family involvement and pay special attention to pregnant women with low levels of education to improve understanding of obstetric danger signs, which can ultimately contribute to a decrease in maternal morbidity and mortality rates.

Keywords: obstetrics danger signs, knowledge, family function, family APGAR, education level, pregnant women.

Correspondence:
Rr. Novita Wahyu Handayani. Faculty of Medicine, Dentistry and Health Science, Universitas Prima Indonesia. Jl. Ayahanda No.68a, Central Sei Putih, Medan Petisah, Medan 20118, North Sumatera. Email: novitawahyuhandayani@gmail.com / mariaman.dr@gmail.

Cite this as:
Handayani RNW, Nasution AN, Lister C (2025). Family Role on the Pregnant Women's Knowledge Toward Obstetric Danger Signs. *J Matern Child Health*. 10(04): 233-244. https://doi.org/10.26-911/thejmch.2025.10.04.05.

BACKGROUND

Pregnancy is a physiological process that brings about complete changes in the physical and mental condition of a mother-to-be. Even though it is considered normal, pregnancy still presents various challenges and risks that have the potential to threaten the safety of the mother and fetus (Yosef and Tesfaye, 2021; Aborigo et al., 2014; Liben et al., 2019; Bakar et al., 2019). Research shows that about 15% of pregnant women experience pregnancy-related complications (WHO, 2012), and every year, about 289,000 women die from pregnancy and childbirth complications worldwide (Asferie and Goshu, 2022). Data released by the World Health Organization (WHO) reveals that during the period 1990-2015, more than 10.7 million women lost their lives due to problems related to pregnancy and childbirth (WHO, 2015).

Maternal mortality can be caused by either direct or indirect factors, with approximately 85% of maternal deaths caused by direct obstetric complications (WHO, 2012). Symptoms that appear during pregnancy and have the potential to harm health are known as Pregnancy Danger Signs (PDS)[9]. Although it is difficult to predict accurately, understanding these early symptoms is essential to prevent serious complications and allow for immediate medical action (Aborigo et al., 2014: Dessu et al., 2019; Phanice and Zachary, 2018).

Pregnant women's awareness and ability to recognize potentially dangerous symptoms during pregnancy, as well as their readiness to seek immediate medical help, have a significant impact on efforts to prevent and reduce maternal morbidity and mortality rates (Rashad and Essa, 2010; Federal Ministry of Health (FMOH), 2006; Lameck, 2017; Rabiu and Ladu, 2019). A lack of understanding of the signs of obstetric distress during pregnancy often leads to delays in seeking or receiving adequate health care.

Women's level of understanding of danger signs during pregnancy is affected by a variety of factors, including demographic aspects (age, employment status, education level), partner characteristics, economic, environmental, and social factors, pregnancy history, access and utilization of health services, as well as health education and available information resources (Wassihun et al., 2020; Tura, 2017; Bhumi and Chajhlana, 2018; Hibstu and Siyoum, 2017; Salem et al., 2018; Woldeamanuel et al., 2019). Various studies have examined the influence of these factors on maternal knowledge of pregnancy danger signs, with mixed results across different populations.

Several studies show that the level of knowledge of pregnant women about the danger signs of pregnancy is still lacking (Teng et al., 2015; Maseresha et al., 2016]. However, in some regions such as rural Thailand, it was discovered that two-thirds of pregnant women have good knowledge of the danger signs of obstetrics (Koovimon et al., 2023). High maternal mortality rates can be reduced through the provision of quality childbirth services and empowering women to recognize the danger signs of pregnancy and encourage appropriate health-seeking behaviors (Wassihun et al., 2020; Hailu and Berhe, 2014).

Meanwhile, the role of the family in supporting maternal health during pregnancy and childbirth has been recognized as an important component of maternal health services. Good family functioning can provide social, emotional, and practical support that is important for pregnant women. However, to date, research that specifically examines the role of the family, measured with standardized instruments such as

the family APGAR, in relation to knowledge of obstetric danger signs is limited.

This study aims to analyze the role of the family in factors related to knowledge about obstetric danger signs in pregnant women who visit the Padang Bulan Community Health Center. The results of this study are expected to provide a more comprehensive understanding of how family function and other factors affect pregnant women's knowledge of obstetric danger signs, so that it can be the basis for the development of more effective interventions in increasing pregnant women's knowledge and awareness, ultimately contributing to a reduction in maternal mortality and morbidity rates.

SUBJECTS AND METHOD

1. Study Design

This was a cross-sectional study conducted at the Padang Bulan Community Health Center, Medan Baru Regency, South Sumatera, Indonesia, August-September 2024.

2. Population and Sample

The population of this study was all pregnant women who visited the Padang Bulan Health Center during the study period. The study sample was taken using the consecutive sampling technique. The inclusion criteria for the study were pregnant women who were present at the Padang Bulan Health Center when the study was conducted and were willing to sign the informed consent. The exclusion criteria were pregnant women who experienced communication disorders and health problems (illness) during the questionnaire-filling-out process. The sample size was determined using the Lemeshow formula. To anticipate drop out, 10% was added so that the sample size was 48 respondents.

3. Study Variables

The dependent variable was the level of knowledge about obstetric danger signs. The independent variables were age, education level, employment status, number of pregnancies (parity), income, and family function (APGAR score).

4. Operational Definition of Variables

Obstetrics Danger Signs Knowledge Questionnaire: Consists of 26 questions that measure pregnant women's understanding of danger signs during pregnancy.

Age is the length of life of the subject expressed in full years

Level of education is the last level of formal education completed by the respondents, categorized as primary, secondary, and higher education.

Employment status is an activity that respondents do to earn income, categorized as employed and unemployed

Number of pregnancies (parity) is the number of pregnancies that respondents have experienced up to the time of the study, categorized as primipara, multipara, and grande multipara.

Income is the amount of family income per month expressed in rupiah, categorized as below the Regional Minimum Wage and above the Regional Minimum Wage.

Family APGAR Instrument: Consists of 5 components that measure family function adaptability, partnership, growth, affection, and resolve.

5. Study Instruments

Data collection used two main instruments, namely the Obstetric Danger Signs Knowledge Questionnaire: It consisted of 26 questions that measured pregnant women's understanding of danger signs during pregnancy. Another instrument used was Family APGAR: It consisted of 5 components that measured family function: adaptability, partnership, growth, affection, and resolve. Each component is scored 0-2, with the total score categorized into: (1) Severe dysfunctional: score 0-3; (2) Mode-

rately dysfunctional: score 4-7; and (3) Highly functional: score 8-10

6. Data analysis

Data were analyzed using SPSS software with univariate, bivariate and multivariate analysis stages. Univariate Analysis: Describe the characteristics of each study variable in the form of frequency and proportion distribution. Bivariate Analysis: Using the Chi-Square test to assess the relationship between each independent variable (age, education level, employment status, number of pregnancies, income, and family function) and the dependent variable (level of knowledge about obstetric danger signs). Multivariate Analysis: Using logistic regression to identify independent predictors that significantly affect the level of knowledge about obstetric danger signs.

7. Research Ethics

This study has received ethical clearance from the Research Ethics Committee of the Faculty of Medicine, Universitas Prima Indonesia, Number: 072/KEPK/UNPRI/-IV/2025.

RESULTS

1. Respondent Characteristics

The characteristics of the respondents in this study included age, education level, employment status, number of pregnancies (parity), family function, and income. The distribution of respondents based on these characteristics is shown in Table 1.

Table 1 shows that most respondents were aged 20-35 years old (70.8%), had a higher level of education (45.8%), worked as housewives (45.8%), and were multigravida (62.5%). Most respondents had a very functional family (85.4%) and a family income ≥ UMR (56.3%). Most respondents (72.9%) had a good level of knowledge about obstetrics danger signs.

Table 1. Characteristics of respondents (n=48)

Characteristics	Frequency (n)	Percentage (%)
Age		
≤35 Years	34	70.8
> 35 Years Old	14	29.2
Education Level		
Primary School (Elementary and Junior High School/Islamic Junior High School)	6	12.5
Secondary School (Senior High School/ Vocational School)	20	41.7
Higher Education (Bachelor Degree)	22	45.8
Employment Status		
Civil Servant	3	6.3
Private Employees	11	22.9
Housewives	22	45.8
Self employed	12	25.0
Parity		
Primigravida	12	25.0
Multi Gravity	30	62.5
Grande Multigravida	6	12.5
Family Function (APGAR)		
Moderate Dysfunctional (4-7)	7	14.6
Highly Functional (8-10)	41	85.4
Income		
≥ Regional Minimum Wage	27	56.3

Characteristics	Frequency (n)	Percentage (%)
< Regional Minimum Wage	21	43.8
Knowledge Level		
Poor	2	4.2
Moderate	11	22.9
Good	35	72.9

2. Bivariate Analysis

Table 2 shows that education (p= 0.008) and family function (APGAR score) (p= 0.005) were statistically related to the level of knowledge about obstetric danger signs. Meanwhile, the age of pregnant women (p= 0.408), employment (p= 0.763), parity (p= 0.878), and income (p= 0.266) were not statistically related to the level of knowledge about obstetric danger signs.

Table 2. The relationship of various variables with the level of knowledge about obstetric danger signs

Variables	Knowledge Level		Total	p
	Poor	Good		
	N (%)	N (%)		
Age				
≤35 Years	11 (32.4)	23 (67.6)	34 (100)	0.189
>35 Years	2 (14.3)	12 (85.7)	14 (100)	
Education Level				
Primary-Secondary Education	12 (46.2)	14 (53.8)	26 (100)	0.001
Higher Education	1 (4.5)	21 (95.5)	22 (100)	
Employment Status				
Unemployed (Housewife)	6 (27.3)	16 (72.7)	22 (100)	0.432
Employed	7 (26.9)	19 (73.1)	26 (100)	
Total Pregnancy (Parity)				
Primigravida	4 (33.3)	8 (66.7)	12 (100)	0.697
Multigravida	9 (25.0)	27 (75.0)	36 (100)	
Family Function (APGAR)				
Dysfunctional	5 (71.4)	2 (28.6)	7 (100)	0.003
Highly Functional	8 (19.5)	33 (80.5)	41 (100)	
Income				
<Regional Minimum Wage	7 (33.3)	14 (66.7)	21 (100)	0.387
≥Regional Minimum Wage	6 (22.2)	21 (77.8)	27 (100)	

3. Multivariate Analysis

Multivariate analysis with logistic regression in Table 3 shows that family function (APGAR) and education level are significant independent predictors of the level of knowledge about obstetric danger signs. Pregnant women with highly functional families were 10.46 times more likely to have a good knowledge of obstetric red tape compared to pregnant women with moderately dysfunctional families (OR= 10.46; 95% CI= 1.56 to 70.39). Only the variables of education and family function (APGAR) were included in the final logistic regression model because only these two variables showed a statistically significant relationship in the bivariate analysis (p<0.05). Meanwhile, pregnant women with higher levels of education were 6.83 times more likely to have good knowledge of obstetric danger signs compared to pregnant women with lower levels of education (OR= 6.83; 95% CI= 1.31 to 35.61).

Table 3. Predictors of knowledge level about obstetric danger signs

Variable	OR	95% CI		p
		Lower limit	Upper limit	
Education	6.83	1.31	35.61	0.023
APGAR Family	10.47	1.56	70.44	0.016

DISCUSSION

This study aims to analyze the role of the family in factors related to knowledge about obstetric danger signs in pregnant women who visit the Padang Bulan Community Health Center. The results showed that the majority of respondents had a good level of knowledge about obstetric danger signs (72.9%). These results are higher than some previous studies conducted in other developing countries. A study by Teng et al. (2015) in Malaysia reported a lack of knowledge among pregnant women about the danger signs of pregnancy. Similarly, Maseresha et al. (2016) found that most pregnant women in the Erer district, Ethiopia, do not have adequate knowledge about the danger signs of obstetrics. However, the results of this study are in line with the findings of Koovimon et al. (2023) in Thailand, who found that two-thirds of pregnant women have a good knowledge of obstetric danger signs.

The high proportion of pregnant women with good knowledge in this study may reflect the effectiveness of the maternal health education program implemented at Padang Bulan Community Health Center, and may also be influenced by the characteristics of respondents who are mostly highly educated (45.8%).

The results showed that there was no statistically significant relationship between the age of pregnant women and the level of knowledge about obstetric danger signs (p= 0.408). Although it is descriptively seen that the age group >35 years had a higher proportion of good knowledge (85.7%) compared to the age group of 20-35 years (67.6%), this difference was not statistically significant.

These findings are in line with the a study by Nurgi et al. (2017) which also find no significant association between age and pregnant women's knowledge of pregnancy danger signs. Similarly, Hibstu and Siyoum's (2017) study shows that age has no significant association with knowledge of obstetric danger signs in pregnant women who come for antenatal examination.

The absence of a significant relationship between age and knowledge level in this study may be due to population characteristics in the study area, where access to health information may be evenly distributed across different age groups. According to Arinta (2021), factors other than age, such as life stage and personal priorities, may play a more significant role in determining the level of understanding and utilization of maternal health information.

This study showed a statistically significant relationship between the level of education of pregnant women and the level of knowledge about obstetric danger signs (p= 0.008). The percentage of respondents with good knowledge had increased progressively along with the increase in education levels: 33.3% in primary education, 60.0% in secondary education, and 95.5% in higher education.

These findings are consistent with previous studies. Wassihun et al. (2020) in their study in Ethiopia find that pregnant women with formal education have significantly better knowledge of obstetric

danger signs compared to mothers without formal education. Bililign and Mulatu (2017) also reports that mothers with secondary or higher education were 4.6 times more likely to have good knowledge of obstetric danger signs compared to uneducated mothers. Similarly, Hailu and Berhe (2014) find that the mother's education level is a significant predictor of knowledge of obstetric danger signs.

Formal education improves literacy skills in general, which allows pregnant women to more easily access, read, and understand written health information. In addition, higher education develops analytical and critical skills, which help pregnant women in processing complex health information and applying it in a personal context (Notoatmodjo, 2010)

The results of the multivariate analysis in this study further reinforced the important role of education level, where education level was an independent predictor of knowledge of obstetric danger signs (OR= 6.83; 95% CI= 1.301 to 3561).

The results showed that there was no statistically significant relationship between the employment status of pregnant women and the level of knowledge about obstetric danger signs (p=0.763). These findings are consistent with several previous studies, such as Hailu and Berhe (2014) and Woldeamanuel et al. (2019), which also find no significant association between employment status and knowledge of obstetric danger signs.

However, these results differ from some other studies, such as Nurgi et al. (2017) and Wulandari and Laksono (2020), which found that working mothers had better knowledge of pregnancy danger signs. These differences may be due to the different socio-economic contexts and health systems at the research site.

According to research Hidayat (2014) puts forward an interesting perspective that non-working mothers, although they may not have an extensive knowledge background, tend to have more time to access and study health information. On the other hand, Ika (2019) states that working mothers have a greater opportunity to interact with the outside environment and access information from various sources.

The absence of a significant association in this study may indicate that in the work area of Padang Bulan Community Health Center, access to maternal health information was evenly distributed among pregnant women with various employment statuses.

No statistically significant association was found between the number of pregnancies (parity) and the level of knowledge about obstetric danger signs (p=0.878). Although descriptively there was an increase in the proportion of knowledge which was in line with the increase in parity (66.7% in primigravida, 73.3% in multigravida, and 83.3% in grande multigravida), however, this difference was not statistically significant.

These findings are in line with a study by Hibstu and Siyoum (2017) and Tamang et al. (2021), which also find no significant association between parity and knowledge of obstetric danger signs. However, in contrast to a study by Bhumi and Chajhlana (2018), Bililign and Mulatu (2017), and Asferie and Goshu (2022), which found that parity was a significant factor influencing knowledge of obstetric danger signs.

According to research Siska et al. (2019) in their study in Indonesia find that parity is related to pregnant women's knowledge of pregnancy danger signs. They explain that a woman who has given birth more than once has more experience and information related to pregnancy and the danger signs that may occur.

The absence of a significant association in this study may indicate that in the working area of Padang Bulan Community Health Center, previous pregnancy experience was not the main factor influencing the level of knowledge about obstetric danger signs. This may be due to the existence of effective health education programs in local health facilities, which ensure that all pregnant women, regardless of previous pregnancy experience, are adequately informed about the danger signs of obstetrics.

The results showed a statistically significant relationship between family function (APGAR score) and the level of knowledge about obstetric danger signs (p= 0.005). In the group of pregnant women with a highly functional family (APGAR score 8-10), 80.5% had good knowledge of obstetric danger signs, while in the group with a moderately dysfunctional family (APGAR score 4-7) only 28.6% had good knowledge.

A study on the relationship of family function measured by APGAR scores with knowledge of obstetric danger signs is still limited in the literature. However, few studies have investigated the role of family support and social support in the context of maternal health.

Theoretically, family APGAR measures five components of family function: adaptability, partnership, growth, affection, and resolve. According to Smilkstein (1978), good family function can provide social, emotional, and practical support that is important for family members, including in the context of Health. In the context of maternal health, a well-functioning family can provide important emotional and informational support for pregnant women, assist in accessing health information, encourage positive health-seeking behaviors, and facilitate effective communication with healthcare providers.

According to research Herawati et al. (2017) in their study in Indonesia find that family function is positively related to marital quality and family welfare. Although they do not directly investigate the relationship with knowledge of obstetric danger signs, their findings suggest that good family functioning can create a supportive environment for the health and well-being of family members, including pregnant women.

The results of the multivariate analysis in this study showed that family APGAR was a strong independent predictor of obstetric danger signs knowledge (OR= 10.465; 95% CI= 1.56 to 70.39), even stronger than education level. These findings emphasize the importance of considering family dynamics in the development of maternal health programs.

No statistically significant association was found between family income and the level of knowledge about obstetric danger signs (p=0.266). These findings are in line with a study of Hailu and Berhe (2014) and Bililign and Mulatu (2017), which also find no significant association between income and knowledge of obstetric danger signs.

However, these results differ from several other studies, such as Wassihun et al. (2020), Nurgi et al. (2017), and Asferie and Goshu (2022), which found that a family's monthly income is a factor that significantly affects pregnant women's knowledge of pregnancy danger signs. Wulandari and Laksono (2020) also reported that the wealth quintile is one of the determinants of knowledge about pregnancy danger signs.

The absence of a significant association in this study may indicate that in the working area of Padang Bulan Community Health Center, access to maternal health information may be relatively evenly distri-

buted among pregnant women with different income levels. This can be due to the effectiveness of maternal health programs in local health facilities, or the presence of other factors such as education level or the more dominant role of the family in influencing the level of knowledge.

These findings emphasize the importance of the role of the family and formal education in increasing pregnant women's knowledge of obstetric danger signs. Maternal health education programs need to consider family dynamics and increase family member involvement in antenatal care, as well as pay special attention to pregnant women with lower levels of education to ensure they have adequate access to important health information.

AUTHORS CONTRIBUTION

Rr. Novita Wahyu Handayani: Principal researcher, study design, data collection, data analysis, and manuscript writing.
Ali Napiah Nasution: Main supervisor, study concept, methodology, and manuscript review.
Clarissa Lister: Co-supervisor, study supervision, and manuscript review

FUNDING AND SPONSORSHIP

The study was self-funded.

ACKNOWLEDGEMENT

The researcher would like to thank all the participants who have helped us in this study.

CONFLICT OF INTEREST

The author states that there is no conflict of interest.

REFERENCES

Aborigo RA, Moyer CA, Gupta M, Adongo PB, Williams J, Hodgson A, Allote P, et al. (2014). Obstetric danger signs and factors affecting health seeking behaviour among the Kassena-Nankani of Northern Ghana: a qualitative study. Afr J Reprod Health. 18(3):78-86. https://pubmed.ncbi.nlm.nih.gov/25438512/.

Asferie W, Goshu B (2022). Knowledge of pregnancy danger signs and its associated factors among pregnant women in Debre Tabor Town Health Facilities, South Gondar Administrative Zone, North West Ethiopia, 2019: cross-sectional study. SAGE Open Med. 10:20503121221074492. https://doi.org/10.1177/20503121221074492.

Arinta I (2021). Faktor-faktor yang mempengaruhi pengetahuaun tentang buku KIA pada ibu hamil (Factors that influence knowledge about the KIA book in pregnant women). J Malahayati. 7(4):658-663.

Bakar R, Mmbaga B, Nielsen B, Manongi R (2019). Awareness of danger signs during pregnancy and post-delivery period among women of reproductive age in Unguja Island, Zanzibar: a qualitative study. Afr J Reprod Health. 23(1):27-36. https://doi.org/10.29063/ajrh2019/v23i1.3.

Bililign N, Mulatu T (2017). Knowledge of obstetric danger signs and associated factors among reproductive age women in Raya Kobo district of Ethiopia: a community based cross-sectional study. BMC Pregnancy Childbirth. 17(1):70. https://doi.org/-10.1186/s12884-017-1253-4.

Bhumi M, Chajhlana S (2018). Knowledge of obstetric danger signs among pregnant women attending antenatal clinic at rural health training centre of a medical college in Hyderabad. Int J Community Med Public Health. 5(6):

2471-2475. https://doi.org/10.18203-/2394-6040.ijcmph20182185.

Dessu S, Gedamu G, Tamiso A (2018). Assessment of knowledge on danger sign of pregnancy and associated factors among ANC attendant pregnant women in Arbaminch Town Governmental Institutions, Southern Ethiopia. Ann Med Health Sci Res. 8(1):64-69.

Federal Democratic Republic of Ethiopia MoH (2006). National reproductive health strategy, 2006-2015. Addis Ababa: Federal Ministry of Health (FMOH).

Hailu D, Berhe H (2014). Knowledge about obstetric danger signs and associated factors among mothers in Tsegedie district, Tigray region, Ethiopia 2013: community based cross-sectional study. PLoS One. 9(2). https://doi.-org/10.1371/journal.pone.0083459.

Herawati T, Zubairi BK, Musthofa M, Tyas F (2018). Dukungan sosial, interaksi keluarga, dan kualitas perkawinan pada keluarga suami istri bekerja (Social support, family interaction, and marital quality in working husband and wife families). J Ilmu Keluarga Konsum. 11(1):1-12. https:-//doi.org/10.24156/jikk.2018.11.1.1.

Hibstu D, Siyoum Y (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. Arch Public Health. 75:35. https://doi.org/10.118-6/s13690-017-0203-y.

Hidayat A (2014). Metode penelitian kebidanan dan teknik analisis data (Midwifery research methods and data analysis techniques). 2nd ed. Jakarta: Salemba Medika.

Ika S (2019). The relationship of knowledge levels about danger signs of third trimester pregnancy with mother's motivation to perform ANC in Sarwo Indah Private Practice Midwife. J Midwifery Nurs. 12(1).

Koovimon P, Kaikaew K, Mahoree K, Bumphenkiatikul T (2023). Knowledge of obstetric danger signs and associated factors among pregnant women attending antenatal care services at Thai community hospital. F1000Res. 12:851. https://doi.org/10.12688/f10-00research.131478.1.

Lameck A (2017). Knowledge of danger signs during pregnancy and health care seeking actions among pregnant women at Ilembula RCH Clinic, Njombe. Ann Med Surg (Lond.). 85(5): 1722–1730. https://doi.org/-10.1097/MS9.0000000000000610.

Liben M, Wuneh A, Zepro N (2019). Knowledge of pregnancy danger signs and associated factors among pastoral women in Afar Regional State, Ethiopia. Cogent Med. 6:1612133. https://-doi.org/10.1080/2331205X.2019.1612133.

Maseresha N, Woldemichael K, Dube L (2016). Knowledge of obstetric danger signs and associated factors among pregnant women in Erer district, Somali region, Ethiopia. BMC Womens Health. 16:30. https://doi.-org/10.1186/s12905-016-0309-3.

Nurgi S, Tachbele E, Dibekulu W, Wondim W (2017). Knowledge, attitude and practice of obstetric danger signs during pregnancy in Debre Berhan, Ethiopia. Health Sci J. 11(6):533. https://doi.org/10.21767/1791-809X.-1000533.

Notoatmodjo S (2010). Ilmu perilaku kesehatan (Health behavioral science). Makassar: Rineka Cipta.

Phanice O, Zachary M (2018). Knowledge

of obstetric danger signs among pregnant women attending antenatal care clinic at health facilities within Bureti Sub-County of Kericho County, Kenya. Res Obstet Gynecol. 6(1):16-21. https://doi.org/10.5923/j.rog.20-180601.03

Rabiu A, Ladu H (2019). Knowledge of obstetric danger signs among pregnant women attending antenatal clinic in Murtala Muhammad Specialist Hospital, Kano, Nigeria. Pyramid J Med. 2(1):19. https://doi.org/10.-4081/pjm.2019.19

Rashad W, Essa R (2010). Women's awareness of danger signs of obstetrics complications. J Am Sci. 6:1299-1306. Available at: https://www.scirp.org/-reference/referencespapers?reference id=2987241.

Salem A, Lacour O, Scaringella S, Herinianasolo J, Benski A, Stancanelli G, et al (2018). Cross-sectional survey of knowledge of obstetric danger signs among women in rural Madagascar. BMC Pregnancy Childbirth. 18:46. https://doi.org/10.1186/s12884-018-1664-x.

Siska D, Anwary A, Anggraeni (2019). Hubungan paritas dan fungsi pemanfaatan buku KIA dengan pengetahuan ibu hamil tentang tanda bahaya kehamilan di wilayah kerja Puskesmas Martapura 2 Kabupaten Banjar (The relationship between parity and the function of KIA book utilization with pregnant women's knowledge about pregnancy danger signs in the working area of Martapura 2 Health Center, Banjar Regency). J Midwifery Reprod. 3(1):16-20.

Smilkstein G (1978). The family APGAR: a proposal for a family function test and its use by physicians. J Fam Pract. 6(6):1231-1239.

Tamang S, 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 Childbirth. 21(1):104. doi: 10.1186/s12884-021-03570-6.

Teng S, Zuo T, Jummaat F, Soon K (2015). Knowledge of pregnancy danger signs and associated factors among Malaysian mothers. Br J Midwifery. 23(11): 800-806. doi: 10.12968/bjom.2015.-23.11.800.

Tura T (2019). Assessment of knowledge of obstetric danger signs during pregnancy among pregnant mothers in Wolaita Sodo Hospitals and Sodo Town Health Centers in 2017. J Health Med Nurs. 65(1):1-11. DOI: 10.7176/JHMN

Yosef T, Tesfaye M (2021). Pregnancy danger signs: Knowledge and health-seeking behavior among reproductive age women in southwest Ethiopia. Womens Health (Lond). 17:17455065-211063295. https://doi.org/10.1177/-17455065211063295.

Wassihun B, Negese B, Bedada H, Bekele S, Bante A, Yeheyis T, et al (2020). Knowledge of obstetric danger signs and associated factors: a study among mothers in Shashamane town, Oromia region, Ethiopia. Reprod Health. 17(1):4. https://doi.org/10.11-86/s12978-019-0853-z.

Woldeamanuel 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 Res Notes. 12:606. https://doi.org/10.11-86/s13104-019-4639-8.

World Health Organization, World Bank,

UNICEF (2015). Trends in maternal mortality: 1990-2015: estimates from WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division. Geneva: World Health Organization.

World Health Organization (WHO), World Bank, UNICEF (2012). Trends in maternal mortality: 1990 to 2010: WHO, UNICEF, UNFPA and The World Bank estimates. Geneva: World Health Organization.

Wulandari R, Laksono A (2020). Determinants of knowledge of pregnancy danger signs in Indonesia. PLoS One. 15(5). https://doi.org/10.1371/journal.pone.0232550.