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**

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Abstract

Background: Pregnancy complications are one of the most common health problems and causes of death among women in developing countries. Knowledge of obstetric danger signs during pregnancy, labor, and postnatal period is an essential first step for the appropriate and timely referral.

Objective: To assess knowledge of pregnancy danger signs and its associated factors among pregnant women at Debre Tabor Town Health Facilities, South Gondar Zone, Northwest Ethiopia, 2019.

Methods and Materials: Facility-based cross-sectional study conducted from 30 December 2018 to 30 January 2019 among 340 pregnant women. Simple random sampling was used to select study subjects. Data entered to Epidata 4.2 and exported Statistical package for social science version 26 for analysis. Binary logistic regression analysis was performed to determine predictors of knowledge of pregnancy danger signs among pregnant women. Finally, a p-value less than 0.05 was used to identify the significant variables.

Result: Overall women's knowledge score on pregnancy danger signs was 74.4%. This finding is not satisfactory and affects pregnancy outcomes. Age, religion, women's educational status, family size, educational status, and antenatal care follow-up were identified as predictors of knowledge of pregnancy danger signs.

Conclusion: Overall knowledge scores of pregnancy danger signs among women were satisfactory compared with different researches in Ethiopia and different countries. Age, mother's occupation, and antenatal care visit were significant factors of knowledge of pregnancy danger signs among study participants.

Keywords

Pregnancy, danger sign, women, Debre Tabor, Ethiopia

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Introduction

Pregnancy danger signs are warning signs that women encounter during pregnancy, childbirth, and postpartum. Globally, about 289,000 women die each year because of problems related to pregnancy and childbirth. Maternal mortality also remains a major challenge in developing countries. In sub-Saharan Africa, 1 out of every 16 women dies due to pregnancy-related causes.1

The World Health Organization (WHO) estimated 300 million women in developing counties suffer from short-term

or long-term illness due to pregnancy and childbirth that leads to high maternal mortality. More than half of these deaths occur in sub-Saharan Africa. According to the 2016 Ethiopia

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Demographic and Health Survey (EDHS), Ethiopian maternal mortality account 442.²

About 75% of maternal deaths occur due to direct obstetric complications like hemorrhage, sepsis, pregnancy hypertensive disorders, obstructed and prolonged labor, and unsafe abortion.³ Most mothers died in their homes due to poor awareness and definition of pregnancy danger signs. In Ethiopia, hemorrhage, hypertensive disorders of pregnancy, abortion, and sepsis are the leading causes of maternal deaths, which can be averted through recognition of danger signs of these complications and skilled institutional care, according to the Ethiopian.⁴

Severe vaginal bleeding, prolonged labor, convulsions, retained placenta, premature rupture of membrane, fetal malposition are the commonest danger signs during labor and childbirth. Raising awareness among pregnant women about danger signs improves early detection of problems and reduces delays in deciding to seek obstetric care.⁵

Every pregnant woman faces the risk of sudden, unpredictable complications that could end up with death or injury to themself or to their infant. Pregnancy-related complications cannot be reliably predicted.⁶

The burden of obstetric danger signs is very critical, and pregnant women easily die from this preventable obstetric danger sign. Identifying pregnancy danger signs and its complications increase the capacity of women, their partners, and families to seek timely health care, following the appropriate steps to ensure safe birth and post-partum.⁷

Antenatal care (ANC) has a potential role to identify and manage pregnancy complications, educate women's risks during pregnancy and promote skilled birth attendance during childbirth.⁸ Knowledge of the danger signs of obstetric complications is the essential first step in the appropriate and timely referral to essential obstetric care.⁹

The majority of obstetric complications can be prevented if their occurrence is recognized and women receive timely quality obstetric care.¹⁰ Appropriate knowledge of pregnancy danger signs is very critical to save the life of the mother and the fetus. Therefore, this study aimed to assess knowledge about pregnancy dangers signs and its associated factors among pregnant women at Debre Tabor Town Health Facilities, Northwest Ethiopia.

Methods and materials

Study area and period. The study was conducted at Debre Tabor Town Health Facilities. Debre Tabor Town is located 103 km far from Bahirdar (capital city of Amhara National Regional State). It is found 666 km away from Addis Ababa. The town has six Kebele and a total population of 60,563 of whom females account for 31,863 (52.6%). There is one hospital and three health centers in the town offering health care services for the population. The was study conducted from 30 December 2018 to 30 January 2019.

Study design. A facility-based cross-sectional study design was conducted.

Source population. All pregnant women who attended ANC at Debre Tabor Town Health Facilities during the data collection period were the source populations.

Study population. All sampled pregnant women attended ANC at Debre Tabor Town Health Facilities during the data collection period.

Eligibility criteria

Inclusion criteria. Those pregnant women who had ANC followed up at Debre Tabor Town Health Facilities were included in this study.

Exclusion criteria. Pregnant women who were seriously ill were excluded from the study.

Sample size determination and sampling technique. The sample size was calculated using the single population proportion formula, by considering the following assumptions. The proportion (*p*) of knowledge on pregnancy danger signs from the previous study,¹¹ 95% level of confidence $(Za/2)^2 = 1.96$, 5% of absolute precision, and 10% non-response rate. Hence, the final sample size was 340.

$$n = \frac{(Za/2)^2 p(1-p)}{(D)^2}$$
$$n = \frac{(1.96)^2 0.386(1-0.386)}{(0.05)^2} = 364$$

The reduction formula was used since the population was less than 10,000.

$$n = \frac{364}{1 + \frac{(364 - 1)}{2041}} = 309$$

By adding a 10% none response rate, the final sample size could be 340. Source population (2041, average number of pregnant women attending ANC services in 1-month duration in the most recent quarterly report to study period in Debre Tabor Town Health Facilities).

Data collection tools and sampling procedure. Data were collected using a structured questionnaire which was prepared by reviewing previous studies.^{11,12} The questionnaire was first prepared in English then translated into the local language (Amharic). Pretest was conducted at 5% of participants in Mekane Eyesus Health Center and modification was considered according to its findings. The data were collected by face-to-face interviews by BSc holders, two nurses who are not working in the assigned area. The simple random sampling technique was used to select participants for the interview. The clients were interviewed in the waiting area prior to taking the ANC inappropriate and private room.

Operational definition

Knowledgeable. Those pregnant women who answer knowledge measuring items correctly above the mean value otherwise not knowledge.

Statistical analysis. The data were checked for completeness, entered into EPI Data version 4.2 to assure quality, and exported to SPSS version 26 for analysis. Descriptive statistics like frequencies, mean, SD, and percentage were calculated. The knowledge score of the participants was calculated by computing the response of the participants in knowledge measuring questions and using mean values as the cut-off points to classify the participants as knowledgeable and not knowledgeable. All variables were entered into a bivariate analysis and those explanatory variables with a p-value < 0.25 in the crude analysis.

Multivariable binary logistic regression analysis was carried out, and those variables with a p-value < 0.05 in the analysis and odds ratio with 95% confidence interval (CI) were taken as significant predictors of knowledge of pregnancy danger signs. Results are presented in tables, graphs, and figures.

Data quality assurance. Pre-tested data were done before the actual data collection to assure data quality. The training was given to data collectors for 1 day by the principal investigator focusing on the objective of the study, how to obtain consent, and keeping the confidentiality of the participants. The collected data were checked for completeness every day by the supervisors.

Ethical consideration

Ethical clearance was obtained from Debre Tabor University's Ethical Review Committee. The University wrote an official letter was written to the Debre Tabor Town Health Office and consequently, The Town Health Office wrote a letter to each Health Facility. Before the interview, each participant was informed of the purpose of the study, possible benefits from the study, and confidentiality. Then, written informed consent was also taken individually, and any participant who was not assured had a full right to refuse to participate whether in the beginning or in the middle of the interview without any negative connotation on their future service. They were also informed that they will be kept anonymous.

Results

Socio-demographic characteristics of the respondents

Three hundred and forty women were included in this study (response rate of 100%). Regarding sociodemographic, the majority of participants were in the age group of
 Table I. Socio-demographic and economic distribution of participants in Debre Tabor Town Health Facilities, South Gondar Administrative Zone, Amhara, Ethiopia, 2019.

Variables	Category	Frequency	Percent (%)
Mother's	18–24	120	35.3
age	25–34	150	44.1
	35-44	40	11.8
	≥45	30	8.8
Ethnicity	Amhara	331	97.4
-	Tigre	9	2.6
Religion	Orthodox	305	89.7
	Muslim	20	5.9
	Protestant	15	4.4
Educational	Married	310	91.2
status	Single	5	1.5
	Divorced	20	5.8
	Widowed	5	1.5
Woman's	House wife	40	11.8
occupation	Farmer	20	5.9
	Merchant	135	39.6
	Day laborer	15	4.4
	Governmental employee	110	32.4
	Students	20	5.9
Husband's	Farmers	22	7
occupation	Merchants	130	42
	Day laborers	20	6.5
	Government employee	110	35.5
	Students	28	9
Woman's	Unable to read and write	30	8.8
education	Primary school	70	20.6
	Secondary school	100	29.4
	Diploma and above	140	41.2
Husband	Unable to read and write	15	19.4
education	Primary school	60	38.7
	Secondary school	120	37.1
	Diploma and above	115	4.8
Income	<500 ETB	80	23.6
	500–999 ETB	160	47
	>1000ETB	100	29.4

(25–34 years) 44.1% (150), married 91.2% (310), and merchants 39.6% (135) (Table 1).

Obstetric histories of the respondents

Regarding obstetric history, the majority of respondents had first ANC follow-up 37.6 % (128), stillbirth 85.3% (290), and antenatal visits 88.8% (302) (Table 2).

Knowledge of pregnant mothers about pregnancy danger signs

The overall knowledge score of pregnancy danger signs was 74% (252) (Figure 1). A majority, 89.4% (304) of respondents had information about pregnant danger signs and 67.4%

(205) of the pregnant mothers got information about danger signs from the hospital (Table 3).

Factors associated with knowledge of pregnancy danger signs

Multivariable logistic regression analysis was performed to identify significant factors of knowledge of pregnancy danger signs using SPSS version 26. Women's age group (35–44) years, Religion, women's occupational status, women's educational status, source of information about danger signs, and women with ANC follow-up were significant predictors of knowledge of pregnancy danger signs. Women's age group (35–44 years) were 2.6 times more likely knowledgeable about danger signs than mothers age group <18–24 (adjusted odds ratio (AOR): *2.6 (1.87–9.7)). Similarly, protestant followers had a 3.1 times more likely knowledge of pregnancy danger sign than orthodox Christianity followers (AOR: *3.1 (1.00–6.2)). Regarding occupation, governmental employee mothers knew five times more likely pregnancy danger sign

Table 2. Obstetric histories of the pregnant women in DebreTabor Health Facilities, Ethiopia, 2019.

Variables	Categories	Frequency	Percent (%)
Amount of	First	128	37.6
ANC visit	Second	100	29.4
	Third and above	112	33
Number of still	No still birth	290	85.3
births	I–2	45	13.2
	3–4	5	1.5
ANC follow-up	Yes	302	88.8
	No	38	11.2

as compared to housewives, and this was the highest knowledge level of mothers associated with danger signs of pregnancy (AOR: *5. 00 (1.04–8.1)) (Table 4).

Discussion

The overall knowledge score of the pregnant women about danger signs of pregnancy was 74.4% (CI 69.4%–79%). This finding is higher as compared with studies in Kinondoni municipality, Tanzania 31%⁹ and in South Nigeria (24.9%),¹³ Mechekel (55.1%),¹⁴ Debre Birhan, Ethiopia (38.6%),¹¹ and Northern Ethiopia (37.5%).¹² The main reason of inconsistency might be the difference in the level of awareness and access the service among study participants. In addition, this finding was higher as compared to a study conducted at



Figure 1. Knowledge of pregnant women about pregnancy danger signs in Debre Tabor Town Health Facilities, South Gondar Zone, North West Ethiopia, 2019.

Table 3. Knowledge of pregnancy danger signs among pregnant women in Debre Tabor Town Health Facilities, South Gondar Zone,North West Ethiopia, 2019.

Variables	Categories	Frequency	Percent (%)	
Do you have information about	Yes	304	89.4	
pregnancy danger signs?	No	36	10.6	
Sources of information	Health facilities	205	67.4	
	TV	49	16.1	
	Radio	50	16.5	
Face pregnancy danger sign	Yes	87	25.6	
	No	253	74.4	
Which type of pregnancy danger sign	Vaginal bleeding	27	31	
do you know?	Sudden gush of fluid before labor	6	6.9	
	Severe headache	27	31	
	Dizziness and blurred vision	10	11.5	
	Swelling of hands and face	5	5.7	
	Loss of fetal movement	3	3.4	
	Severe abdominal pain	9	10.3	
Pregnancy danger sign preventable	Yes	305	89.7	
	No	35	10.3	

Variables	Knowledge of pregnancy danger signs		COR (95% CI)	AOR (95% CI)
	Knowledgeable	Not knowledgeable		
Age of the mother				
18–24	92	28	1.00	1.00
25–34	130	20	0.00	0.00
35-44	10	30	2.9 (2.35-10.46)	*2.6 (1.87–9.7)
45	20	10	0.9	1.00
Ethnicity				
Amhara	245	86	1.3 (1.3-4.6)	1.00
Other	7	2	0.9	0.00
Religion	N=340	-	•	
Orthodox	226	89	0.6	0.00
Muslim	14	6	1.15 (0.9-4.8)	1.00
Protestant	12	3	3.6 (1.06–5.8)	*3.1 (1.00–6.2)
Marital status		U U	0.0 (1.00 0.0)	5.1 (1.00 0.2)
Married	226	84	0.00	0.00
Single	4		1.09 (0.62_3.5)	1.00
Divorced	18	2	0.00	0.00
Widowed	4		0.00	0.00
Mother occupation	Т	I	0.00	0.00
House wife	21	19	0.00	0.00
Framor	17	2	0.00	0.00
Morehant	17	5	0.00	0.00
Devilation	100	33		0.00
Day laborer	12	22	1.23 (0.67 - 4.3)	1.00 *F 00 (1.04, 0.1)
Government employee	87	23	5.7(1.10-7.22)	5.00 (1.04-0.1)
Students	12	0	1.3 (0.25–3.00)	1.00
Student		12	0.00	0.00
Student	16	12	0.00	0.00
Framer	12		0.00	0.00
Merchant	95	35	1.00	1.00
Day laborer	13	7	0.86	1.00
Government	80	30	0.54	0.00
Mothers educational				
Unable to read and write	27	3	5.7 (0.73–4.99)	*4.2 (0.7–4.34)
Primary school	50	20	0.6	0.6
Secondary school	70	30	1.00	1.00
College and above	105	35	0.4	0.00
Husband educational		_		
Unable to read write	10	5	1.00	1.00
Primary school	40	20	0.00	0.00
Secondary school	90	30	1.00	1.00
College and above	82	33	1.00	1.00
Monthly income				
<500 ETB	160	50	1.00	1.00
>1000 ETB	92	38	1.1 (0.3–1.8)	1.00
ANC visit				
Yes	246	56	3.4 (0.88–6.09)	*3. (1.00–7.3)
No	6	32	0.00	0.00
Sources of information				
Health facilities	200	55	1.00	1.00
TV	16	33	0.00	0.00

Table 4. Factors associated with knowledge of pregnancy danger sign among pregnant women in Debre Tabor Town Health Facilities,South Gondar Zone, North West Ethiopia, 2019.

 $\boldsymbol{NB}:$ * Represents a statistically significant variable with p value less 0.05.

Harrar Regional state, Ethiopia 44.67%.¹⁵ This difference might be due to the difference in study settings.

Our study finding is also higher as compared with study at Sidama Zone (24.1%)¹⁶ and Eastern Ethiopia (30.4%).¹⁷ The discrepancy may be due to the difference might be due to the level of knowledge and access to health information among women.

This study finding is also lower than the study in Madagascar (80.9%).⁹ The main reason for this difference might be geographical difference and availability of service for participants. In addition, this study finding is in line with study at Mizan Aman, Ethiopia (77.5%).⁹

In this study, age was a significant factor for pregnancy danger signs among study participants. The resulting finding showed that those mothers in age greater than 35 years were 2.6 times more likely to be knowledgeable about pregnancy danger signs than mothers greater than 35 years (AOR: 2.6 (1.87–9.7)). This finding is in-line with the study conducted at Shashemene, Ethiopia,¹¹ and Yirgachefe, Ethiopia.¹⁸ It may be as the women's age increases, they can be familiar with different danger signs and get information from their colleagues. Similarly, the region was a significant factor for pregnancy danger signs among participants. Those protestant followers were 3.1 times more likely to be knowledgeable than orthodox Christianity followers (AOR: 3.1 (1.00–6.2)).

Regarding occupation, governmental employee mothers were five times more likely to be knowledgeable than housewives (AOR: 5.00 (1.04–8.1)). This study was in line with Yirgachefe.¹⁸ The governmental employee might easily access informed of pregnancy danger signs. In addition, the participants who had ANC visits were 3.1 times (3.1 (1.00–7.3)) more likely to be knowledgeable than those who had no ANC visits. The main reason, might as a woman accessing the ANC, they will get adequate information regarding pregnancy danger signs by healthcare providers.

Limitations of the study

Since it is a cross-sectional study, it is difficult to claim causal relationships. The study used cross-sectional study design which only gives evidence of women's knowledge status within the times of the study period. It does not tell women's knowledge of obstetric pregnancy danger signs before and after of the study period.

Conclusion

Overall knowledge scores of pregnancy danger sign among women were satisfactory compared with different researches in Ethiopia and different countries. Age, mother's educational status, mother's occupation, and ANC visit were significant predictors of pregnancy danger signs among study participants. The majority (83.9%) of the mothers had information about pregnant danger. Even though, the majority of pregnant mothers know about danger sign of pregnancy, it is not enough because all pregnant women are at risk for pregnancy danger signs. Therefore, the proper ANC delivery and community mobilization about awareness creation about pregnancy danger signs are very crucial. The healthcare provider should better emphasize counseling concerning pregnancy danger signs during ANC service promotion and community mobilization. The participants were also recommended to attend regular ANC visits and attain adequate information regarding pregnancy danger signs and their preventions.

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Authors' contributions

W.N. and B.G. contributed to the study conception and design, W.N. supervised the study and conducted data analysis; B.G. was involved in data collection and contributed on data analysis, W.N. critically revised the manuscript. Finally, all authors read and approved the final draft of the manuscript.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethics approval

Ethical approval for this study was obtained from Debre Tabor University Ethical and Research Review Committee (approval no. dt/201/2019). Confidentiality of data kept at all levels of the study, and the data not used for other purposes other than for this study.

Informed consent

Written informed consent was obtained from all study subjects before the actual study.

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Supplemental material

Supplemental material for this article is available online.

References

- Shora T, Verma A, Jan R, et al. Knowledge regarding antenatal care services, its utilization, and delivery practices in mothers (aged 15–49 years) in a rural area of North India. *Trop J Med Res* 2015; 18: 89.
- Teng SP, Zuo TC, Jummaat FB, et al. Knowledge of pregnancy danger signs and associated factors among Malaysian mothers. *Br J Midwifery* 2015; 23: 800–806.

- Jhpiego. Monitoring birth preparedness and complication readiness. Tools and indicators for maternal and newborn health, 2004, http://www.jhpiego.org/files/BPCRtoolkit.pdf-birth
- Abas AA and Fakhredeen E. Knowledge about danger signs and symptoms of pregnant women attending antenatal care centers in Baghdad City. J Nurs Health Sci 2017; 6(4): 37–40.
- Sumankuuro J, Crockett J and Wang S. Factors influencing knowledge and practice of birth preparedness and complication readiness in sub-saharan Africa : a narrative review of cross-sectional studies. *Int J Community Med Public Health* 2016; 3(12): 3297–3307.
- Jhpiego/Maternal and neonatal health (MNH) Program. Birth preparedness and complication readiness: a Matrix of shared responsibilities. Baltimore, MD: Jhpiego, 2008.
- August F, Pembe AB, Mpembeni R, et al. Men's knowledge of obstetric danger signs, birth preparedness and complication readiness in rural Tanzania. *PLoS ONE* 2015; 10(5): e0125978.
- Salem A, Lacour L, Scaringella S, et al. Cross-sectional survey of knowledge of obstetric danger signs among women in rural Madagascar. *BMC Pregnancy Childbirth* 2018; 18: 46.
- Mwilike B. Knowledge of danger signs during pregnancy and subsequent health seeking actions among women in Kinondoni Municipality, Tanzania. Kampala, Uganda: Makerere University, 2013.
- Ameh C, Msuya S, Hofman J, et al. Status of emergency obstetric care in six developing countries five years before the MDG targets for maternal and newborn health. *PLoS ONE* 2012; 7(12): e49938.
- Solomon AA, Amanta A, Chirkose E, et al. Knowledge about danger signs of pregnancy and associated factors among pregnant

women in Debra Birhan Town, Central Ethiopia. *Sci J Public Health* 2015; 3(2): 269–273.

- Woldeamanuel GG, Lemma G and Zegeye B. Knowledge of obstetric danger signs and its associated factors among pregnant women in Angolela Tera District, Northern Ethiopia. *BMC Res Notes* 2019; 12(1): 606.
- Okoror CEM and Omuemu VO. Knowledge of obstetric danger signs among antenatal clinic attendees in South–South Nigeria. *Health Care Women Int*. Epub ahead of print 2 August 2021. DOI: 10.1080/07399332.2021.1941025.
- Amenu G, Mulaw Z, Seyoum T, et al. Knowledge about danger signs of obstetric complications and associated factors among postnatal mothers of Mechekel District Health Centers, East Gojjam Zone, Northwest Ethiopia, 2014. *Scientifica (Cairo)* 2016; 2016: 3495416.
- Hussen A. Knowledge about pregnancy danger signs among mothers attending antenatal care in Jugal Hospital, Harari Regional State, Ethiopia, 2019. *Public Health Indonesia* 2019; 5(3): 73–79.
- Hailu M, Gebremariam A and Alemseged F. Knowledge about obstetric danger signs among pregnant women in Aleta Wondo District, Sidama Zone, Southern Ethiopia. *Ethiop J Health Sci* 2010; 20(1): 25–32.
- Tilahun T and Sinaga M. Knowledge of obstetric danger signs and birth preparedness practices among pregnant women in rural communities of eastern Ethiopia. *Int J Nurs Midwifery* 2016; 8(1): 33.
- Hibstu DT and Siyoum YD. 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* 2017; 75: 35–39.