Assessment of Knowledge about Danger Signs of Pregnancy and its Associated Factors among Women in Akaki Kality Sub-City, Addis Ababa, Ethiopia

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Abstract

Background: Maternal mortality rates in Ethiopia are still high; at an estimated 412 per 100,000 live births, where little is known about the status of pregnant women on danger signs of pregnancy. Increasing women's knowledge of pregnancy danger signs is essential for safe motherhood.

Objectives: To assess knowledge about danger signs of pregnancy and its associated factors among women in the Akaki-Kality sub-city, Addis Ababa, Ethiopia

Methods: A cross-sectional study was conducted among pregnant women in the Akaki-kality sub-city from July 10 to July 25, 2022. A total of 464 study participants were chosen using a systematic random sampling technique. The level of knowledge of pregnancy danger signs was assessed using descriptive statistics, which were also used to summarize other variables. The associated factors with knowledge about the danger signs of pregnancy were declared using a binary logistic regression model with an adjusted odds ratio and a 95% confidence interval (CI).

Results: This study showed that about 259(57.6%) women had good knowledge about the danger signs of pregnancy. Family size [AOR: 1.929, 95% CI (1.138, 3.271)], Number of birth/parity [AOR: 3.872, 95% CI (1.039, 14.438)], Age of pregnancy at first ANC visit [AOR: 0.284, 95% CI (0.158, 0.510)] and be advised on danger sign of pregnancy during ANC visit [AOR: 4.212, 95% CI (2.159, 8.216)] were variables significantly associated with knowledge about danger signs of pregnancy.

Conclusion: More than half of the respondents were knowledgeable about the danger signs of pregnancy and action targeted to those significantly associated variables with knowledge about the danger signs of pregnancy should be taken to expand knowledge of women on pregnancy danger signs.

Keywords: Knowledge; Danger signs; Pregnancy

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Background

Expectant moms experience several physical and psychological changes as a result of pregnancy, which is a normal process. However, a normal pregnancy may be accompanied by several issues and complications that could negatively impact the health of mothers and babies, raising the degree of maternal mortality and morbidity [1]. Eighty percent of maternal deaths worldwide are directly related to obstetric problems. This includes infection, obstructed and protracted labor, bleeding, unsafe abortion, pregnancy-induced hypertension, and other conditions [2]. Women should be made aware of obstetric danger indicators during pregnancy, birth, and the postpartum period because it is assumed that "every pregnancy poses dangers" [1].

The WHO's 2019 study states that maternal mortality is at an unacceptable level. In 2017, almost 295 000 women lost their lives during pregnancy, or soon after childbirth. The vast majority of these fatalities (94%) happened in areas with little resources, and the bulk of them could have been avoided [3].

Evidence suggested that 86% (254 000) of the expected global maternal deaths in 2017 occurred in Sub-Saharan Africa (SSA) and Southern Asia. Two-thirds (196,000) of maternal deaths occurred in Sub-Saharan Africa alone, while one-fifth occurred in

Southern Asia [3].

Even though Ethiopia has achieved the Millennium Development Goal targets for child health set for 2015 by the international community, it has failed to do so concerning maternal health. That is why maternal deaths are still high, with an estimated maternal mortality ratio of 412 maternal deaths per 100,000 live births [4, 5]. The main causes of maternal mortality in Ethiopia are bleeding, hypertensive disorders of pregnancy, abortion, and sepsis [6]. Delays in seeking and receiving expert care are caused by a lack of knowledge of risk signs and symptoms during pregnancy, labor, delivery, and postpartum [7].

A strategy to increase the use of competent care during low-risk births and emergency obstetric treatment in complicated cases in low-income countries, such as Ethiopia, is knowledge of obstetric danger signs and birth readiness [8]. Therefore, spreading more information and raising awareness is vital to shortening the time it takes to get to a health center and seek medical attention [9]. However, in the study area; there are limited data regarding knowledge about the dangerous signs of pregnancy among women.

Justification of the study

As the evidence showed that maternal deaths are still high in Ethiopia [4], it is possible to prevent practically all maternal mortality-related obstetric risk signs by raising public knowledge of these signals during pregnancy, delivery, and the postpartum period. However, in the study area, the awareness status of danger signs among women of reproductive age is not known. Therefore, this study aimed to determine the status of knowledge about the danger signs of pregnancy and its associated factors among women in the Akaki kality sub-city, Addis Ababa, Ethiopia.

Methods and Materials

Study area and period

The study was conducted in Akaki Kality sub-city from July 10 to July 25, 2022. Akaki Kality is one of the eleven sub-cities of Addis Ababa and is the industrial zone of Addis Ababa. It is located in the southern parts of the city. It is 20 km far from the city's center. The sub-city has 13 warheads which is currently the lowest level administration unit. According to Akaki Kality sub-city health office statistics, its population is 258,030 (male 126,435 and female 131,595). The sub-city has 1 hospital, 9 health centers, and 2 maternal child health (MCH) clinics.

Study design: A Community-based cross-sectional study design was used

Population

Source population: The source of the population was all pregnant women who live in the Akaki Kality sub-city

Study population: All pregnant women who were randomly selected during data collection were study population

Eligibility criteria

Inclusion criteria: All pregnant women who live in the Akaki Kality sub-city were included in this study.

Exclusion criteria: Critically ill and health professional mothers were excluded from the study.

Sample size determination

EPI INFO for Windows 7 computed the sample size (n = 464) based on a single population proportion and the following presumptions: Earlier research in Dire-Dawa administrative town, eastern Ethiopia (2018), p = 24.1% (percentage of moms who had a good awareness of pregnancy hazard signals) [10]. Confidence interval (CI): 95%; margin of error (d): 5%; design effect (g): 1.5; and none response rate: 10%.

Sampling procedure

A two-stage sample technique was used to select the sub-city woredas and homes containing pregnant women. The first five woredas in the Akaki Kality sub-city were chosen at random from a total of 13 woredas. Pregnant women were taken using a systematic random sampling procedure after the sample size was proportionally distributed to each chosen woreda. For this study, the sampling interval for each woreda was calculated as (Kth) = N/n, with 12 being the Kth number for each woreda after the first family was randomly chosen as the starting point from the health office for each woreda. The study's sampling process is briefly illustrated in **figure 1** below.

Variables included in the study

Knowledge about danger signs of pregnancy is considered as an outcome variable, whereas Socio-demographic variables (Age of women, Occupational status, Educational status, Family size, and Monthly income); Obstetric and ANC follow-up (Parity, Gravidity, ANC follow-up, Place of previous delivery); Health institution factor (Informed about pregnancy danger signs during ANC) and source of information are explanatory variables.

Operational definition

Good Knowledge. If a woman spontaneously mentioned three or more major pregnancy danger signs, it was assumed that she had good knowledge; if she mentioned fewer than three, it was assumed that she had low knowledge.

Data collection methods

To ensure consistency and collect pertinent data on socio-demographics and women's knowledge of danger signs of pregnancy, questionnaires were adopted from various works of literature (10–12) and first modified in English before being translated into the local language (Amharic) and then back into English by another person who is fluent in both languages.

The questionnaires were administered by five trained diploma-holder nurse data collectors. The Face-to-face interview was employed and the interviewers are nurses to facilitate communications to obtain reliable information. However, for the study participant who was refusing to answer at any time of the interview to any specific questions, it was recorded as missing and the questionnaire is recorded as incomplete.
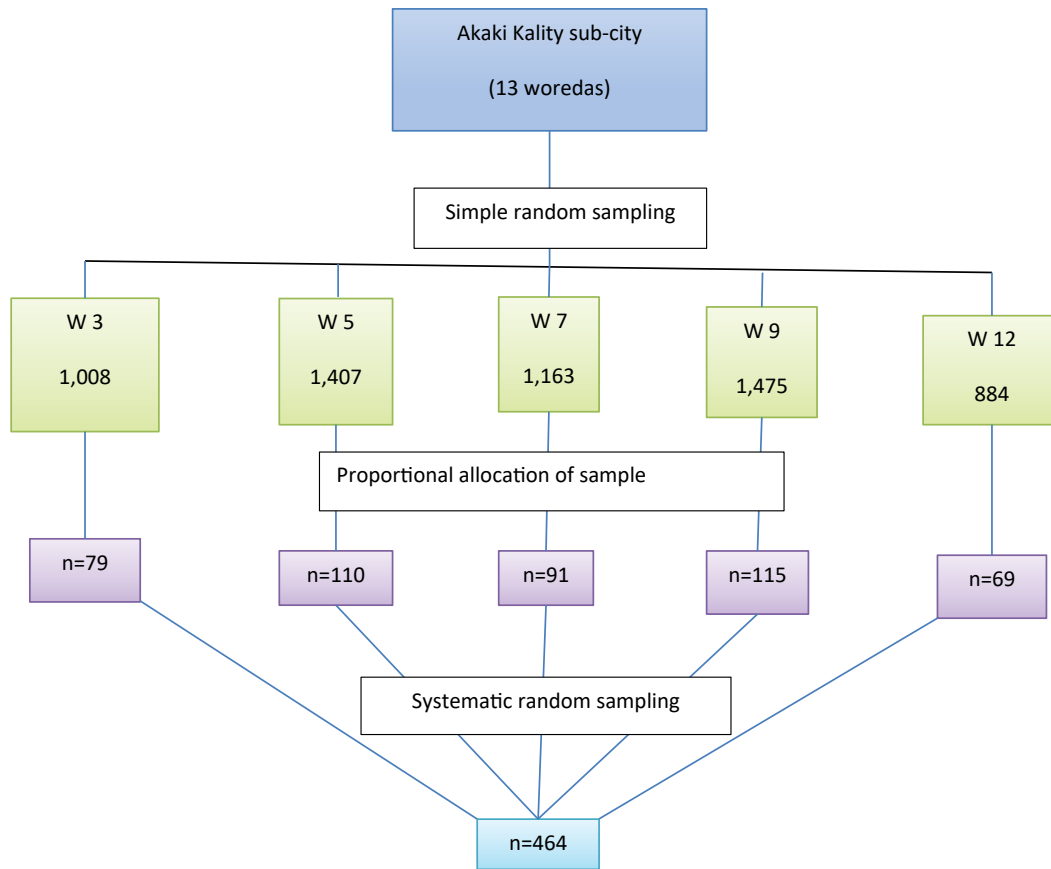
Figure 1 Sampling procedure for assessment of knowledge about the danger signs of pregnancy and its associated factor among women in the Akaki Kality Sub-city, Addis Ababa, Ethiopia, July 10 to 25, 2022 (n=464).

Data quality management

The lead investigator conducted a one-day training session for the data collectors and supervisors to assure the quality of the data. The session included the study's goals, relevance to current knowledge, interviewing techniques, information confidentiality, and informed consent.

The pretest sample size for the questionnaires was 5%. Before beginning the real data collection, a pretest was conducted to gauge how well respondents understood the questionnaire and determine how much time would be required. The questionnaire was then adjusted following the results of the pretest.

The lead researcher supervises and plans all of the study project's general activities. To understand how the data collectors manage the questionnaires, supervision was conducted during data collection. Before entering data, each questionnaire was reviewed for completion. The principal investigator coded each full questionnaire on a coding sheet to reduce errors. Finally, it was analyzed by the principal investigator.

Data processing and analysis

Data entry was carried out using EPI-Data 3.1, while data cleaning and analysis were carried out using SPSS 26 software; following cleaning, prepare coding instructions. The accuracy of the data entering was cleaned up by using frequency count and percentage. The level of knowledge about pregnancy danger signs was assessed using descriptive statistics, which were also used to summarize other study factors.

The binary logistic regression model was employed to determine factors associated with the knowledge about the danger signs of pregnancy. In a multivariable analysis, a variable with a p-value of less than 0.20 in a bivariate analysis was included. Statistical significance was set at p-0.05, and the adjusted odds ratio with a 95% confidence interval was used to quantify the strength of the link. The Hosmer-Lemeshow goodness of fit test's p value in this study was 0.552, indicating that the model adequately describes the data.

Results

Socio-demographic characteristics of participants

A total of 464 mothers were included in the study and complete response of 450(96.98%) was obtained from all respondents. The respondents' average age was 28.40 (±4.829SD) years, ranging from 15 to 42, with the majority of them 295 (65.6%) between the ages of 21 -30. Three hundred seventy-five (83.3%) were married. The majority of the participants; 380(84.4%)

were educated and 293(65.1%) were employed. The majority of participants 295, (65.6%) had a monthly income of less than or equal to 5,000 Birr (**Table 1**).

Obstetrics and ANC follow-up characteristics of participants

Regarding obstetrics history of participants; 307(68.2%) said they have less than or equal to two numbers of pregnancy/gravidity. The majority of women 325(72.2%) said they gave birth less than two and 281 (62.4%) of them gave birth at the health facility. Three hundred twenty-seven (72.7%) visited an antenatal clinic during their last pregnancy and 183(40.7%) started ANC visits early within four months of pregnancy age. Almost nearly half of the women 206(45.7%) were follow ANC two times or more. More than half of the participants 232(51.6%) said that they have got the opportunity to be advised on the danger signs of pregnancy during an ANC visit. About 390(86.7%) heard about danger signs during pregnancy and 162(36%), 78(17.3%) & 153(34.0%) got information from health professionals, friends, and media, respectively (**Table 2**).

Knowledge about danger signs of pregnancy

When study participants were asked about possible pregnancy danger signs, the majority of them mentioned decreased fetal movement 415(92.2%), severe vaginal bleeding 408(90.7%), severe abdominal pain 229(50.9), severe headache with blurred vision 206(45.8%), swelling of fingers, face and legs 206(45.8%), foul smell vaginal discharge 194(43.1%), loss of consciousness 178(39.6%), too weak to get out of bed153(34.0%), high-grade fever 150(33.3%) and difficulty in breathing 144(32.0%) as pregnancy danger signs (**Table 3**).

Status of knowledge about danger signs of pregnancy

According to this study, 57.6% (95% CI: 53.1 - 62.2%) of women had good knowledge about the danger signs of pregnancy, while the remainder had poor knowledge (**Figure 2**).

Table 1. Socio-demographic characteristics of women in the Akaki Kality Sub-city, Addis Ababa, Ethiopia, 2022.

Variable	Category	Frequency (n=450)	Percentage (%)
Age of mother	≤ 20	16	3.6
	21 -30	295	65.6
	≥ 31	139	30.9
Marital status	Married	375	83.3
	Not in a married union	75	16.7
Education status	Illiterate	70	15.6
	Educated	380	84.4
Occupational status	Unemployed/ housewife	157	34.9
	Employed	293	65.1
Family size	Four or less	216	48
	Five and above	234	52
Total monthly income	≤ 5000	295	65.6
	≥ 5001	155	34.4

Table 2. Obstetrics and ANC follow-up characteristics of women in the Akaki Kality Sub-city, Addis Ababa, Ethiopia, 2022.

Variable	Category	Frequency (n=450)	Percentage (%)
Number of pregnancy/ gravida	Two and less	307	68.2
	More than two	143	31.8
Number of birth/parity	Less than two	325	72.2
	Two and above	125	27.8
Place of recent birth	Health facility	281	62.4
	Home	60	13.3
	primigravida	109	24.2
ANC visit	Yes	327	72.7
	No	123	27.3
Age of pregnancy at first ANC visit	Four months or less	183	40.7
	Greater than four months	165	36.7
	Not at all visit ANC	102	22.7
Number of ANC follow up	One time	144	32
	two times and above	206	45.8
	Not at all	100	22.2
Opportunity to be advised on danger signs of pregnancy during ANC visit	Yes	232	51.6
	No	218	48.4
Heard about danger signs during pregnancy	Yes	390	86.7
	No	60	13.3
Source of information	Health professionals	162	36
	Friends	78	17.3
	Media	153	34
	Not at all	57	12.7

Table 3. Knowledge about danger signs of pregnancy among women in the Akaki Kality Sub-city, Addis Ababa, Ethiopia, 2022.

| Variable	Category	Frequency (n=450)	Percentage (%)
Severe vaginal bleeding	Yes	408	90.7
	No	42	9.3
Severe headache with blurred vision	Yes	206	45.8
	No	244	54.2
Decreased fetal movement	Yes	415	92.2
	No	35	7.8
Swelling of fingers, face, and legs	Yes	206	45.8
	No	244	54.2
Too weak to get out of bed	Yes	153	34
	No	297	66
Difficulty in breathing	Yes	144	32
	No	306	68
High-grade fever	Yes	150	33.3
	No	300	66.7
Severe abdominal pain	Yes	229	50.9
	No	221	49.1
Foul smell vaginal discharge	Yes	194	43.1
	No	256	56.9
Loss of consciousness	Yes	178	39.6
	No	272	60.4
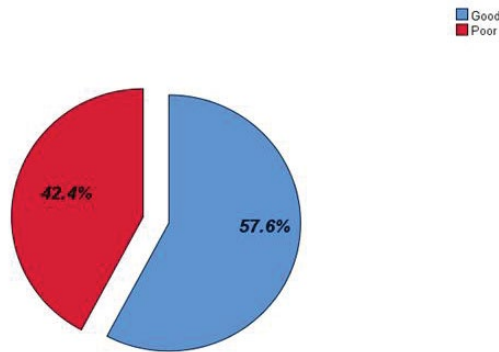
Figure 2 Status of knowledge about the danger signs of pregnancy among women in the Akaki Kality Sub-city, Addis Ababa, Ethiopia, 2022.

Factors associated with knowledge of danger signs of pregnancy among women

Univariate analysis: In this study the bivariate analysis showed that age of mother, family size and total monthly income; the number of pregnancies/gravida, number of birth/parity, place of recent birth, age of pregnancy during first ANC visit, number of ANC follow up, the opportunity to be advised on danger sign of pregnancy during ANC visit, heard about danger signs during pregnancy and source of information were significantly associated with knowledge about danger signs of pregnancy. However, the rests have no association with the knowledge about the danger signs of pregnancy.

Multivariate analysis: The results from multivariate binary logistic regression analysis revealed that family size, number of birth/parity, age of pregnancy during the first ANC visit, and the opportunity to be advised on danger signs of pregnancy during ANC visit were independently associated with knowledge bout danger signs of pregnancy.

Women from a family size of five or more were 1.9 times more likely knowledgeable about danger signs of pregnancy [AOR: 1.929, 95% CI (1.138, 3.271)] when compared to women from a family size of four or less. Women who gave birth two times and above were 3.9 times more likely to have good knowledge about the danger signs of pregnancy [AOR: 3.872, 95% CI (1.039, 14.438)] as compared to women who gave birth less than two. Those mothers who visit the ANC clinic for the first time at age of pregnancy greater than four months were 72% less likely to know the danger sign of pregnancy [AOR: 0.284, 95% CI (0.158, 0.510)] compared to their counterparts. Women, those who got the opportunity to be advised on danger signs of pregnancy during ANC visits were 4.2 times more likely knowledgeable about danger signs of pregnancy [AOR: 4.212, 95% CI (2.159, 8.216)] when compared to women who didn't get such like chances.

In multivariate analysis, age of mothers, marital status, total monthly income, number of pregnancy/gravida, place of recent birth, number of ANC follow up, heard about danger signs during pregnancy, and source of information were not showed any association with knowledge about danger signs of pregnancy (**Table 4**).

Discussion

The current study revealed that 57.6% (95% CI: 53.1 - 62.2%) of women were knowledgeable about danger signs of pregnancy which is relatively similar with studies done in Dilla university referral hospital, Ethiopia 58% [11], Wolaita zone, SNNPR, Ethiopia 58.77% [12] and Indonesia 54.1% [13]. However, the result of this study was lower than the study conducted in Arba-Minch town, Southern Ethiopia 68.4% [6]. The current finding is also relatively high compared to a study done in Angolela Tera District, Northern Ethiopia 37.5% [14], Dire-Dawa administration town, Eastern Ethiopia 24.1% [15], Debre Berhan, Ethiopia 31.8% [7], Urban Tanzania 31% [16] and India 31.2% [17]. The variation might be due to the study period or differences in the study year, the opportunity to get advice on danger signs of pregnancy or attention given to dangerous signs of pregnancy by health professionals may differ across the world, and socio-cultural differences in the study population, and place of residences.

The present study finding showed that family size was significantly associated with women's knowledge of pregnancy danger signs. It implied that women from a family size of five or more were knowledgeable about danger signs of pregnancy. It is consistent with the study done in the Afar Regional State, Ethiopia [18]. This could be because women would get crucial information about the pregnancy danger signs from their family members.

In this study, the number of birth/parity was one factor that has been indicated as an independent predictor of knowledge about danger signs of pregnancy. Women who gave birth two times and above were 3.9 times more likely to have good knowledge about the danger sign of pregnancy when compared to their counterparts. This finding is consistent with the study done in Dilla university referral hospital, Southern Ethiopia [13], and Indonesia [15]. This could be as a result of a woman's increased awareness and ability to detect information from exposure to medical care and health education regarding pregnancy danger symptoms as a result of her prior experience giving birth.

The current findings showed that the age of pregnancy during the first ANC visit was significantly associated with knowledge about the danger signs of pregnancy. Those mothers who visit the ANC clinic for the first time at the age of pregnancy greater than four months were 72% less likely to know danger signs compared

Table 4. Multivariate analysis of determinants of knowledge about the danger signs of pregnancy among women in the Akaki Kality Sub-city, Addis Ababa, Ethiopia, 2022.

Variables	Knowledge of danger signs of pregnancy		COR(95%C.I)	AOR(95%C.I)
	Good n(%)	Poor n(%)		
Age of mother				
≤ 20	5(1.1)	11(2.4)	1	1
21 -30	167(37.1)	128(28.4)	2.87(0.973, 8.468)	1.876(0.482, 7.310)
≥ 31	87(19.3)	52(11.6)	3.681(1.211, 11.186)*	1.585(0.366, 6.864)
Marital status				
Married	221(49.1)	154(34.2)	1	1
Not in a married union	38(8.4)	37(8.2)	0. 716(0.435, 1.177)	1.961(0.940, 4.092)
Family size				
Four or less	106(23.6)	110(24.4)	1	1
Five and above	153(34.0)	81(18.0)	1.960(1.342, 2.864)*	1.929(1.138, 3.271)*
Total monthly income				
≤ 5000	144(32.0)	151(33.6)	1	1
≥ 5001	115(25.6	40(8.9)	3.015(1.969, 4.616)**	1.541(0.861, 2.758)
Number of pregnancy/gravida				
Two and less	148(32.9)	159(35.3)	1	1
More than two	111(24.7)	32(7.1)	3.727(2.370, 5.859)**	0.522(0.139, 1.953)
Number of birth/parity				
Less than two	159(35.3)	166(36.9)	1	1
Two and above	100(22.2)	25(5.6)	4.176(2.560, 6.812)**	3.872(1.039, 14.438)*
Place of recent birth				
Health facility	186(41.3)	95(21.1)	1	1
Home	24(5.3)	36(8.0)	0.341(0.192, 0.604)**	1.723(0.694, 4.282)
primigravida	49(10.9)	60(13.3)	0.417(0.266, 0.655)**	2.097(0.920, 4.779)
Age of pregnancy at first ANC visit				
Four months or less	144(32.0)	39(8.7)	1	1
Greater than four months	73(16.2)	92(20.4)	0.215(0.135, 0.343)**	0.284(0.158, 0.510)**
Not at all visit ANC	42(9.3)	60(13.3)	0.190(.112, 0.322)**	
Number of ANC follow up				
One time	77(17.1)	67(14.9)	1	1
two times and above	140(31.1)	66(14.7)	1.846(1.190, 2.863)*	0.773(0.430, 1.391)
Not at all	42(9.3)	58(12.9)	0.630(0.377, 1.054)	
Advised on danger signs of pregnancy during ANC visit				
Yes	173(38.4)	59(13.1)	4.501(3.013, 6.723)**	4.212(2.159, 8.216)**
No	86(19.1)	132(29.3)	1	1
Heard about danger signs during pregnancy				
Yes	253(56.2)	137(30.4)	16.62(6.972,39.619)**	1.374(0.096, 19.564)
No	6(1.3)	54(12.0)	1	1
Source of information				
Health professionals	120(26.7)	42(9.3)	1	1
Friends	35(7.8)	43(9.6)	0.285(0.161, 0.503)**	0.568(0.279, 1.158)
Media	99(22.0)	54(12.0)	0.642(.396, 1.040)	1.691(0.866, 3.301)
Not at all	5(1.1)	52(11.6)	0.034(0.013, 0.090)**	0.081(0.005, 1.367)

Note: 1=references, *significant at p <0.05, **significant at p <0.001

to their counterparts. This could be explained as delaying ANC visits during pregnancy may decrease the chance of the mother being advised or getting information about the danger signs of pregnancy from health professionals.

The result of this study revealed that knowledge of women in danger signs of pregnancy is significantly influenced by the opportunity to be advised on danger signs of pregnancy during ANC visits. Women, those who got the opportunity to be advised on danger signs of pregnancy during ANC visits were 4.2 times more likely knowledgeable about danger signs of pregnancy when compared to women who didn't get such chances. The current finding is supported by studies done in the Wolaita zone, SNNPR, Ethiopia [14], Dilla university referral hospital, Southern Ethiopia [13], and rural Madagascar [19]. This can be the result of an ANC clinic visit, where a medical expert offers a special chance to directly and personally inform women about obstetric danger signs.

Conclusions

The results of this study showed that more than half of the respondents knew more about the danger signs of pregnancy, and there was an association between women's knowledge of these signs and participant family size, the number of births and parity, age of pregnancy at the first ANC visit, and advice given about these signs during ANC visit. Finally, the Addis Ababa Health Bureau should develop appropriate strategies, including the provision of targeted health education or information in its

plan to increase women's knowledge about the danger signs of pregnancy, focusing on those important factors, and should encourage health workers to put them into practice.

Limitation of the study

Since the study was a community-based cross-sectional study design, it is unable to establish causality between knowledge of pregnancy danger signs and the potential factors. This is because the exposure and outcome variables are collected at the same time.

Abbreviations

AOR   Adjusted Odds Ratio

ANC   Ante Natal Care

CI   Confidence Interval

COR   Crude Odds Ratio

MCH   maternal child health

MMR   Maternal Mortality Rate

SDG   Sustainable Development Goal

SNNPR   Southern Nation, Nationalities and People

SPSS   Statistical Package for Social Science

SSA   Sub-Saharan Africa

WHO   World Health Organization

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