International Journal of Women's Health

Dovepress

open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

Pregnancy Risk Perception, Knowledge of Obstetric Danger Signs and Attitude Towards Skilled Delivery Service Utilization Among Pregnant Mothers in a Rural Setting in South Ethiopia: A Community-Based Cross-Sectional Study

Abinet Arega Sadore[1,2], Yohannes Kebede[1], Zewdie Birhanu[1]

[1]Department of Health, Behaviour and Society, Faculty of Public Health, Institute of Health, Jimma University, Jimma, Ethiopia; [2]School of Public Health, College of Medicine and Health Sciences, Wachemo University, Hossana, Ethiopia

Correspondence: Abinet Arega Sadore, PO Box 667, Hossana, Ethiopia, Email abinetarega24@gmail.com

Background: Poor pregnancy risk perception, ignorance of obstetric risk symptoms, and attitudes toward institutional delivery services are factors that prevent pregnant women from choosing to receive emergency obstetric treatment.

Objective: To assess pregnancy risk perception, attitude towards skilled delivery service, and knowledge of obstetric danger signs and associated factors among pregnant mothers.

Methods: A cross-sectional community-based study design was used. The 668 pregnant women who participated in this study were chosen using a multi-stage sampling methodology. Data were gathered using a pretested questionnaire that was presented by an interviewer. To find independent factors, logistic regression analysis was used. With a p-value of less than 0.05, which denotes statistical significance, a corresponding 95% confidence interval (CI) was calculated.

Results: Pregnancy risk perception was shown to have a lower mean score (23) overall. Only 40.9% of the study participants had high pregnancy risk perception. Over 50% (337) of respondents had a positive attitude towards skilled delivery service utilization. In all categories of obstetric danger signs, only 153 respondents (or 22.9%) knew what the obstetric danger signs were. Maternal age (AOR = 1.966, CI: 1.185–3.261), maternal education (AOR = 1.965, 1.002–3.854), and parity (AOR = 0.534, CI: 0.305–0.933) were factors affecting knowledge of obstetric danger signs. Pregnancy risk Perception (AOR = 14.7, CI: 9.849–22.235) and parity (AOR = 2.27, CI: 1.381–3.733) were significantly associated with attitudes on the use of skilled delivery services.

Conclusion: This study found that pregnant women in rural locations had poor levels of knowledge of obstetric danger sign, attitude toward using skilled delivery services, and perception of pregnancy risk. The knowledge of obstetric danger indicators among pregnant women was considerably affected by the mother's age, education, and parity. The perception of pregnancy risk and parity were found to be substantially associated with attitudes towards skilled delivery services.

Keywords: pregnancy risk perception, pregnant mothers, Ethiopia

Background

In 2017, too many women died from pregnancy-related causes and childbirth-related causes. Complications during and after childbirth claimed the lives of close to 300,000 women. Most of these deaths (94%) were avoidable and took place in low-income settings. Two-thirds (196,000) and one-fifth (254,000) of all maternal deaths occurred in sub-Saharan Africa and Southern Asia, respectively. Sub-Saharan Africa accounted for approximately 86% (254,000) of all maternal deaths (58,000).[1,2]

Ethiopia is one of the nations most affected by high maternal and newborn deaths. Obstetric problems such as bleeding, obstructed labor/ruptured uterus, pregnancy-induced hypertension, puerperal infection, and unsafe abortions are

Received: 5 September 2023
Accepted: 22 November 2023
Published: 27 November 2023

the main causes of mother death in Ethiopia. Anaemia and malaria were the two most reported indirect causes of maternal death.[3] Ethiopia's maternal and infant mortality rates have reduced by 50% since 2000; however, they are still excessively high at 412 per 100,000 live births and 67 per 1000, respectively.

Risk perception is the way that individuals judge and assess the hazards to which they may be exposed.[3,4] It appears that a higher perception of health danger enhances protective motivation, thus it is critical to comprehend how people view health risks, how correct these views are, and how their perception influences their behaviour.[5] High-risk pregnant women's decisions about prenatal care and the care they receive during their pregnancies are greatly influenced by their risk perception. Risk perception is a significant concern, particularly during pregnancy when behavioural changes in health have the potential to affect both the mother and the fetus.[6]

Pregnancy-related risk perception is a subject that has attracted a lot of attention globally. According to a recent concept analysis, women's perceptions about risk during pregnancy have an impact on their decision-making during pregnancy and childbirth.[7] Pregnancy-related risk perception is a complicated topic because it affects both the mother and the fetus. Because even well-intentioned measures may not be successful without this understanding, prenatal care professionals must be aware of how women perceive risk.[4,8]

Unexpected events that happen to pregnant women during pregnancy, labor, childbirth, or postpartum are known as obstetric danger indicators.[9,10] Among the most frequently observed obstetric danger symptoms include impaired vision, the absence of fetal movements, vaginal bleeding, a gush of fluid from the vagina, high temperature, foul-smelling vaginal discharge, convulsions, abdominal pain, and severe headaches. More than 75% of maternal mortality in developing nations are caused by pregnancy-related conditions which are preventable.[11–14] Maternal health promotion and education for women, men, and community members to enhance awareness about obstetric danger signs are effective measures that can prevent birth-related complications.[15] Henceforth, the World Health Organization (WHO) suggests educating all pregnant women about obstetric danger signs at each prenatal visit.[16] Doing so will enable early detection of obstetric danger signs and facilitate appropriate emergency obstetric care.[5]

Numerous studies revealed that the level of knowledge of obstetric danger signs was low in sub-Saharan Africa and Asia, even though recognizing and understanding them plays an important role in reducing both maternal and child mortality by prompting the decision to seek emergency interventions.[6–8]

Studies have shown that pregnant women put off making decisions to seek obstetric treatment because of poor understanding of the risks and difficulties in pregnancy-related complications.[17,18] Studies done in Ethiopia revealed that there is a lack of awareness of obstetric danger signs among pregnant women.[19,20] The majority of the research on pregnant women's awareness of obstetric danger signs in Ethiopia was conducted in urban and institutional settings. This study helps in identifying the gaps in the community's understanding of obstetric danger signs, level of knowledge of pregnancy risk perception, and attitude toward skilled delivery service use among pregnant women in rural areas. It will also be a resource for health service providers, policymakers, and program managers as they develop intervention strategies to increase community awareness of obstetric danger signs and pregnancy risk. As far as we are aware, there has never been a published study done in the rural environment on the topic. Therefore, this study sought to evaluate pregnant women's perceptions of pregnancy risks, degree of understanding of obstetric danger signs, attitudes toward using skilled delivery services, and related factors in rural areas of Hadiya Zone, Southern Ethiopia.

Methods

Study Design and Setting

This study was conducted in two districts of Hadiya Zone: Lemo and Ameka districts. Hadiya Zone is situated 232 kilometers from Addis Ababa, the capital city of Ethiopia, in the South nation and nationalities regional state of Southern Ethiopia. The study took place between February 10 and March 25, 2023. A cross-sectional study with a focus on the community was used.

All of the pregnant women who lived in the two districts during the study period comprised the source population. Participants who were gravely ill and unable to communicate were not included in this study. This study was part of a cluster randomized control trial study that examined the effectiveness of engagement of religious leaders in maternal health

education. It is part of the baseline survey. The sample size was determined based on a cluster randomized control trial study design. According to the Ethiopia Demographic and Health Survey 2019, skilled birth attendance in a rural area of Ethiopia was predicted to be 43%.[9] The sample size was based on 80% power to detect a 15-percentage point anticipated difference in the proportion of skilled delivery service utilization (an increase from 43% to 58%) (With a 5% error level) and design effect of 2. A sample size of 50 pregnant mothers per cluster was required, and accordingly, the final calculated sample size was 341 per pregnant mothers per group after considering a 10% loss (682).

Twelve clusters from two Hadiya Zone districts were involved in this study (Lemo and Ameka districts). In order to locate clusters (kebeles), a simple random sampling technique was used. Pregnant women were then contacted using a cluster sampling technique. Interviews with pregnant women who met the inclusion requirements were conducted for the study. The participants in the baseline study did not intend to leave their current residence before the completion of the follow-up period. In cooperation with health extension workers and kebele leaders, a census was carried out to determine all eligible pregnant women of reproductive age (15–49 years) who permanently resided in the selected districts from the selected clusters. Once pregnancy was detected through census work, the women would be recruited for the study.

Data Collection and Procedure

We used questionnaires that already existed from studies done before and adapted them to fit our needs. The questionnaires were pretested and administered by an interviewer. They were developed by the Johns Hopkins Program for International Education in Gynaecology and Obstetrics (JHPIEGO) maternal and neonatal health program, and we tweaked them to fit the local context and our research goals.[10] We pre-tested a survey among 25 pregnant mothers who were not a part of the main study. The survey had five sections – socio-demographic, obstetrics, risk perception, danger signs during pregnancy, labor/delivery, and postpartum period and attitude. The data collectors went to respondents' houses and interviewed them in person to gather the data. We recruited data collectors (clinical nurses and BSc nurses) and 2 supervisors (BSc degree in public health). We chose them based on their data collection experience and fluency in the language of the community. They were then trained on the objectives of the study, the survey, and the data collection process. The principal investigators and supervisors double-checked the surveys to make sure they were complete and relevant.

Quality Control

Internal consistency (reliability) was tested by calculating Cronbach's Alpha using SPSS window version 23. Furthermore, health behavior experts crosschecked the content validity of the tool. Data collectors and supervisors were trained about the study instrument and data collection procedure. The principal investigator and the supervisors checked the collected data for completeness.

Measurement and Operational Definitions of the Scale Variables

Pregnancy risk perception was assessed using the questionnaire developed from a previous study.[11] This questionnaire is made up of nine questions which assess how a pregnant women perceive potential dangers during pregnancy. In this study, the questionnaire consists of two subscales that include four questions about the risk to self (mother) (for example "Is the risk of having a caesarean section") and five questions about risk to the baby (for example "is a risk of baby having a birth defect"). Respondents were asked to rate on a five-point scale (1 no risk at all, 2 = unlikely, 3 = possible, 4 = High, 5 = extremely high), how they perceived the pregnancy risk.[12] The scores from each of the 9 items were added up to get a total pregnancy risk perception score. A higher score means that the person has a greater perception of risk. The mean score was used to divide people into two groups: those with a high perception of risk and those with a low perception of risk.

Pregnant women in this study mentioned danger signs during pregnancy, delivery, and postpartum period. We measured how much they knew about these danger signs by asking them to name them without giving leading questions. We sorted their knowledge into two categories: pregnant women with good knowledge and pregnant women with poor knowledge. In this study, a pregnant woman was deemed to be knowledgeable about the danger signs if she could, either spontaneously or upon prompting name at least three significant danger signs for each of the three periods of pregnancy, childbirth, and postpartum. The mothers were prompted by giving them more time to attempt and recall these periods.[13]

Attitude toward skilled delivery service utilization has 10 items that were measured by using a Likert scale where respondents were supposed to strongly agree, agree, neutral, disagree, and strongly disagree.[14] The overall attitude score was computed by summing up the items after performing the reverse scoring for negatively worded sentences. A higher composite score indicated a more positive attitude. The Mean score was used to categorize attitudes into positive and negative attitudes.

Data Processing and Analysis

Data were cleaned and entered using Epidata version 4.6 and analyzed using SPSS version 23. Logistic regression was carried out to identify determinants of obstetric danger signs' knowledge. Variables with $p < 0.25$ in the bivariate analysis were selected as candidate variables for multivariate logistic analysis to control the effect of confounders. Adjusted odd ratios (AORs) with their 95% confidence interval and $p < 0.05$ were considered to have a significant association between the outcome and independent variables. The model fitness was checked using Hosmer and Lemeshow and was found fit.

Results

Socio-Demographic Features of the Respondents

Overall 668 pregnant women participated, with a response rate of 98.0%. More than half, 439 (65.7%) and 371 (55.5%) of the respondents were in the age range of 25–34 years and had primary education status, respectively. A majority, 418 (62.6%) of the respondents were protestant and 202 (30.2%) were Orthodox (Table 1).

Table 1 Socio-Demographic Characteristics of Pregnant Mothers Hadiya Zone, Southern Ethiopia, 2023 (N = 668)

Variables	Category	Frequency	Percent
Age	15–24	149	22.3
	25–34	439	65.7
	35–49	80	12.0
Religion	Protestant	418	62.6
	Orthodox	202	30.2
	Muslim	28	4.2
	Catholic	20	3.0
Maternal Educational	Illiterate	56	8.4
	Primary education (1–8)	371	55.5
	Secondary education (9–12)	199	29.8
	Tertiary education (college or university)	42	6.3
Husband education	Illiterate	18	2.7
	Primary education (1–8)	310	46.4
	Secondary education (9–12)	266	39.8
	Tertiary education (college or university)	74	11.1
occupation	Housewife	550	82.3
	Merchant	76	11.4
	Government employee	35	5.2
	Farmer	7	1.1
Marital status	Married	665	99.6
	Widowed	3	0.4
Family size	1–2 persons	77	11.5
	3–4 persons	285	42.7
	≥ 5 persons	306	45.8

Obstetric History of Respondents

Among the total participants, 421 (63%) were multigravida. Most of the respondents 489 (73.2%) visited antenatal care at least once (Table 2).

Pregnancy Risk Perception

The findings revealed that participants had a low mean score of 23 for their perception of pregnancy risk with a standard deviation of 5.8. Less than half of the study participants 273 (40.9%) had high levels of pregnancy risk perception. This study showed that pregnancy risk perception was high among mothers in the age group of 25–34 years 174 (63.7%), mothers with educational status of primary education 168 (61%), mothers who visited ANC once twice 199 (72%) and multigravida mothers 148 (54%). One hundred sixty (24%), 125 (18.7%), and 299 (38.3%) respondents thought that they had the possibility of losing too much blood, having a cesarean section, and dying during their pregnancy, respectively. The majority of study participants thought that the pregnancy risk to themselves and their babies was unlikely (Table 3).

Table 2 Obstetric Characteristics of Pregnant Mothers Hadiya Zone, Southern Ethiopia, 2023 (N = 668)

Gravidity	Primigravida Multigravida	247 421	37 63
Parity	Nullipara Primipara Multipara	247 162 259	37 24.3 38.8
ANC visit (1–2 times)	Yes No	349 319	52.2 47.8
Pregnancy	Planned Unplanned	499 169	74.7 25.3
Place of previous birth	Home Health Facility	225 196	53.5 46.5
Previous PNC (at least once)	Yes No	105 316	24.9 75.1
History of Stillbirth	Yes No	13 408	3.08 96.92

Table 3 Pregnancy Risk Perception of Pregnant Mothers Hadiya Zone, Southern Ethiopia, 2023 (N = 668)

Items	No Risk at All	Unlikely	Possible	High	Extremely High	Mean (SD)
Risk for self (Mother)						
The risk for myself during this pregnancy is	67(10.0)	399(59.7)	163(24.4)	38(5.7)	1(0.1)	2.45(0.973)
My risk of hemorrhaging (losing too much blood) during this pregnancy is	69(10.3)	404(60.5)	160(24.0)	32(4.8)	3(0.4)	2.44(0.980)
My risk of having a cesarean section is	77(11.5)	412(61.7)	125(18.7)	38(5.7)	16(2.4)	2.39(0.994)
My risk of dying during this pregnancy is	33(4.9)	344(48.4)	229(38.3)	44(6.6)	18(2.7)	2.78(1.057)

(*Continued*)

Table 3 (Continued).

Items	No Risk at All	Unlikely	Possible	High	Extremely High	Mean (SD)
Risk for baby						
The risk for my unborn baby during this pregnancy is	21(3.1)	423(63.3)	185(27.7)	36(5.4)	3(0.4)	2.59(0.942)
My baby's risk of being born prematurely is	7(1.0)	344(51.5)	277(41.5)	36(5.4)	4(0.6)	2.89(0.992)
My baby's risk of having a birth defect is	94(14.1)	374(56.0)	152(22.8)	36(5.4)	12(1.8)	2.42(1.044)
My baby's risk of needing to go to the Neonatal Intensive Care Unit is	44(6.6)	387(57.9)	186(27.8)	32(4.8)	19(2.8)	2.62(1.047)
My baby's risk of dying during this pregnancy is	55(8.2)	424(63.5)	145(21.7)	35(5.2)	9(1.3)	2.44(0.963)
Overall pregnancy risk perception	High levels Low levels	273(40.9%) 395(59.1%)				

Knowledge of Obstetric Danger Signs Among Pregnant Mothers

Only 153 (22.9%) of respondents had knowledge about obstetric danger signs in all categories (pregnancy, childbirth, and postpartum period). 147 (22%), 130 (19.5%) and 128 (19.2%) of study subjects mentioned at least three danger signs during pregnancy, labor, postpartum, and childbirth, respectively. Only 159 (23.8%) of respondents were knowledgeable about danger signs during pregnancy. One hundred thirty-nine (20.8%) of respondents were knowledgeable about danger signs during labor and childbirth and 137 (20.5%) of respondents were knowledgeable about danger signs during the postpartum period. Weakness 173 (25.9%), vaginal bleeding 145 (21.7%), and reduced fetal movement 105 (15.7%) were frequently mentioned danger signs by respondents during pregnancy. Labor of more than 12 h 174 (26%) and abnormal fetal position 109 (16.3%) were frequently mentioned danger signs by study participants during labor and childbirth. One hundred ninety-six (29.3%) of respondents mentioned vaginal bleeding as a danger sign during the postpartum period (Table 4).

Table 4 Obstetric Danger Signs Reported by Pregnant Mothers, Hadiya Zone, Southern Ethiopia, 2023 (N = 668)

Danger Signs	During Pregnancy Number (%)	During Labor/Delivery Number (%)	Postpartum Period Number (%)
Vaginal bleeding	145 (21.7)	NA	196 (29.3)
Abdominal pain	65 (9.7)	19 (2.8)	77 (11.5)
Weakness	173 (25.9)	32 (4.8)	79 (11.8)
Reduced fetal movement	105 (15.7)	NA	NA
Swelling of hands, faces, and legs	71 (10.6)	NA	NA
Blurred vision	28 (4.2)	NA	24 (3.6)
Breathing difficulty	19 (2.8)	NA	53 (7.9)
Severe headache	17 (2.5)	83 (12.4)	41 (6.1)
Fever	30 (4.5)	67 (10.0)	48 (7.2)
Convulsion	15 (2.2)	59 (8.8)	64 (9.6)

(*Continued*)

Table 4 (Continued).

Danger Signs	During Pregnancy Number (%)	During Labor/Delivery Number (%)	Postpartum Period Number (%)
Labor more than 12 h	NA	174 (26)	NA
Abnormal fetal position	NA	109 (16.3)	NA
Excessive bleeding	NA	72 (10.8)	NA
Placenta not delivered within ½ hour	NA	33 (4.9)	NA
Foul smelling lochia	NA	NA	86 (12.9)
Loss of consciousness	NA	20 (3.0)	NA
Overall knowledge of obstetric danger signs	Good knowledge Poor knowledge	153 (22.9%) 515 (77.1%)	

Abbreviation: NA, Not applicable.

Related Factors with Knowledge of Obstetric Danger Signs

In the multivariate logistic regression analysis, the age of respondents, maternal education, and parity were significantly related with knowledge of obstetric danger signs. Pregnant mothers in the age group of 25–34 years were 1.966 times more likely to be knowledgeable of obstetrics danger signs than pregnant mothers who were in the age group of 15–24 years (AOR = 1.966, CI: 1.185–3.261). Pregnant mothers with the educational status of primary education were 1.965 times more likely to be knowledgeable of obstetrics danger signs than pregnant mothers with the educational status of illiterate (AOR = 1.96, CI: 1.002–3.854). It was also observed that the probability of knowing obstetric danger signs decreased by 53% among primipara mothers compared to nullipara mothers (AOR = 0.534, CI: 0.305–0.933) (Table 5).

Attitude Toward Skilled Delivery Service Utilization

This study revealed that participants had a mean score of 30.4 for their attitude toward skilled delivery service utilization with a standard deviation of 7.8. More than half of the study participants 337 (50.4) had a positive attitude toward skilled delivery service utilization (Table 6).

Table 5 Factors Associated with Knowledge of Obstetric Danger Signs in Hadiya Zone, South Ethiopia, 2023 (n = 668)

Variables	Category	Knowledge of Obstetric Danger Signs		AOR, 95% CI	P value
		Good	Poor		
Age	15–24	49 (32.0)	100 (19.4)	1	
	25–34	88 (57.5)	351 (68.2)	1.966(1.185–3.261)	**0.009**
	35–49	16 (10.5)	64 (12.4)	1.867(0.831–4.194)	0.131
Maternal Educational	Illiterate	16 (10.5)	40 (8.4)	1	
	Primary education (1–8)	77 (50.3)	294 (55.5)	1.965(1.002–3.854)	**0.049**
	Secondary education (9–12)	48 (31.4)	151 (29.8)	1.512(0.740–3.088)	0. 257
	Tertiary education (college or university)	12 (7.8)	30 (6.3)	1.129(0.411–3.100)	0.814
Parity	Nullipara	60 (39.2)	187 (36.3)	1	
	Primipara	52 (34.0)	110 (21.4)	0.534(0.305–0.933)	**0.028**
	Multipara	41 (26.8)	218 (42.3)	1.466(0.826–2.600)	0.191

Notes: 1: reference group. A value of p <0.05, bold, is statistically significant.
Abbreviations: AOR, adjusted odds ratio; CI, confidence interval.

Table 6 Attitude Towards Skilled Delivery Service Utilization Among Pregnant Mothers in Hadiya Zone, Southern Ethiopia, 2023 (N = 668)

Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean(SD)
Some people believe that any pregnant woman can develop delivery complication	168(25.1%)	222(33.2%)	30(4.5%)	199(29.8%)	49(7.3%)	2.61(1.3)
Some people feel that delivery complications can be dangerous to the health of a woman	88(13.2%)	281(42.1%)	14(2.1)	231(34.6%)	54(8.1)	2.82(1.2)
It is believed that delivery complications cannot be dangerous to the health of the newborn	150(22.5%)	271(40.6%)	22(3.3%)	165(24.7%)	60(9%)	2.57(1.3)
According to some people's belief, a woman should plan ahead of time where she will give birth to her baby.	37(5.5%)	171(25.6%)	24(3.6%)	351(52.5%)	85(12.7%)	3.4(1.10)
Some women feel that they shouldn't plan ahead of time how they will get to the place where they will give birth.	22(3.3%)	258(38.6%)	14(2.1%)	294(44%)	80(12%)	3.2(1.17)
Some women feel that every pregnant woman need skilled care at delivery needs skilled care during delivery	7(1%)	144(21.6%)	14(2.1%)	395(59.1%)	108 (16.2%)	3.6(1.01)
Few women feel that being attended by male health personnel during delivery is unethical and shame	129(19.3%)	231(34.6%)	10(1.5%)	200(29.9%)	98(14.7%)	2.86(1.4)
According to the feelings of some pregnant women, it is very shameful to deliver on the delivery bed in the labor ward	49(7.3%)	263(39.4%)	9(1.3%)	268(40.1%)	79(11.8%)	3.1(1.2)
Many women believe that women do not go to a health facility for delivery, mainly because it is too expensive.	50(7.5%)	269(40.3%)	12(1.8%)	283(42.4%)	54(8.1%)	3.03(1.2)
Many women believe that women do not go to a health facility for delivery because health personnel do not treat them respectfully	23(3.4%)	301(45.1%)	7(1%)	264(39.5%)	73(10.9%)	3.09(1.1)
Overall attitude	Positive attitude Negative attitude	337(50.4%) 331(49.6%)				

Factors Associated with Attitude Toward Skilled Delivery Service Utilization

In the multivariate logistic regression analysis, perception of pregnancy risk and parity were significantly associated with attitude towards skilled delivery service utilization. Pregnant mothers with a high perception of pregnancy risk were 14.7 times more likely to have a positive attitude towards skilled delivery service utilization than pregnant mothers with low pregnancy risk perception (AOR = 14.7, CI: 9.849–22.235). Parity was another factor that was independently associated with the attitude towards skilled delivery service utilization, pregnant mothers who were multiparous were 2.27 times more likely to have a positive attitude towards skilled delivery service utilization than nulliparous pregnant mothers (AOR = 2.27, CI: 1.381–3.733) (Table 7).

Discussion

The majority of preventable maternal deaths in developing countries are due to delays in the pregnant mother or her family's decision to seek care, delays in visiting the place of delivery, and delays in receiving adequate hospital care.[15] In such cases, the lack of knowledge about pregnancy risk and obstetric danger signs and attitude towards skilled delivery service utilization contribute to the delays in seeking emergency obstetric care, resulting in high mortality and morbidity rates.[16] Pregnant mothers can avoid obstetric complications if they can identify the forewarning pregnancy risks and obstetric danger signs. In resource-limited countries like Ethiopia, increasing the level of awareness of obstetric danger signs and skilled delivery service utilization among women are feasible strategies to reduce maternal mortality and

Table 7 Factors Associated with Attitude Towards Skilled Delivery Service Utilization in Hadiya Zone, South Ethiopia, 2023 (n = 668)

Variables	Category	Attitude Towards Skilled Delivery Service Utilization		AOR, 95% CI	P value
		Positive	Negative		
Age	15–24	76 (22.6)	73 (22.1)	1	
	25–34	227 (67.4)	212 (64.0)	1.377 (0.639–2.968)	0.414
	35–49	34 (10.1)	64 (13.9)	0.698 (0.376–1.296)	0.255
Knowledge of obstetric danger signs	Poor knowledge	228 (76.6)	257 (77.6)	1	
	Good knowledge	79 (23.4)	74 (22.4)	1.086 (0.687–1.717)	0.723
Pregnancy risk perception	Low perceived risk	107 (31.8)	288 (87.0)	1	
	High perceived risk	230 (68.2)	43 (13.0)	14.7 (9.849–22.235)	**0.000***
Parity	Nullipara	150 (44.5)	97 (29.3)	1	
	Primipara	69 (20.5)	93 (28.1)	1.69 (0.984–2.905)	0.057
	Multipara	118 (35.0)	141 (42.6)	2.27 (1.381–3.733)	**0.001***
Gravidity	Primigravida	146 (43.3)	101 (30.5)	1	
	Multigravida	191 (56.7)	230 (69.5)	1.35 (0.869–2.120)	0.180

Notes: 1: reference group. *Significant level at p-value <0.05 indicated in bold.
Abbreviations: AOR, adjusted odds ratio; CI, confidence interval.

morbidity related to obstetric complications.[21] However, the pregnancy risk perception and level of knowledge are low among women in Southern Africa including Ethiopia.[6,7,17,22–24] This study was conducted to assess the current pregnancy risk perception, attitude towards skilled delivery service utilization, and level of pregnant women's knowledge of obstetric danger signs and related factors in rural areas in Hadiya Zone, Southern Ethiopia.

The result showed that more than half of pregnant mothers had a low perception of obstetric risks and the total and a low mean score of pregnancy risk perception of 23. This finding is lower than the one reported using different instruments to measure pregnancy risk perception in Northern Ethiopia. This study found that 48% of respondents had a high level of pregnancy risk perception.[18] The mean score in our study score is lower than the findings reported in Canada (mean score 29.67) which utilized the same instrument to measure pregnancy risk perception among nulliparous Canadian women of advanced maternal.[19] Similarly, a study in Thailand found that women of advanced maternal age had mean scores of perception of pregnancy risk that fell below (32.9).[12] This difference might be because of the difference in maternal age and measurement instruments. Another possible explanation is that risk perception in pregnancy is multifaceted and influenced by multiple personal factors.

In this research, the overall proportion of knowledge of obstetric danger signs among pregnant mothers was 22.9%. This finding is consistent with the finding reported in South Ethiopia in Yirgachefe city (21.9%)[20] and Eastern Democratic Republic of the Congo (21.9%).[25] Our study was done among rural mothers. In this study, the knowledge of obstetric danger signs was higher than the findings reported in Wolayita Sodo City in Southern Ethiopia (16.8%)[26] and Jordan (15.2%).[27] In addition, it is lower than the values reported by studies conducted in Chamwino District, Tanzania (25%),[28] Angolela Tera District in Northern Ethiopia (37.5%), Hossan Town Southern Ethiopia (63%),[29] Shashemane Town in the Oromia region in Ethiopia (40%)[27] and KwaZulu Natal in South Africa (52%).[27] This discrepancy could be differences in the sociocultural backgrounds that characterize each of these regions.

In this study, obstetric danger signs were categorized into three parts: pregnancy, labor/childbirth, and the postpartum period. The danger signs that were most frequently discussed during pregnancy were weakness 173 (25.9%), vaginal bleeding 145 (21.7%), and reduced fetal movement 105 (15.7%), which is contradictory to a study reported in the Eastern

Democratic Republic of the Congo, which found that severe abdominal pain was the best-known danger sign.[25] This result was in line with other research findings published in Ethiopia and Africa and revealed that severe vaginal bleeding was the frequently mentioned obstetric danger sign during pregnancy and postpartum period.[13,20,25,28,29] Labor of more than 12 hours and abnormal fetal position were the most common danger signs mentioned by study participants during labor and childbirth. This finding was consistent with the finding reported in Wolayita Sodo Town, Southern Ethiopia.[26]

In this study, the age of pregnant mothers, maternal education, and parity were determinants of knowledge of obstetric danger signs. Pregnant mothers aged 25–34 years were more likely than other age groups to be knowledgeable of obstetric danger indicators. This result is consistent with results from other studies that have been done in Arbaminch, Wolayita Sodo, and Yirgacheffe Towns, South Ethiopia, and South Eastern Nigeria. Women in this age category are believed to be physically and psychologically ready to accept information about obstetric danger signs. This result contradicts a study conducted in the Eastern Democratic Republic of the Congo that found women aged 30–39 years were more likely than other age groups to be knowledgeable of obstetric danger indicators.[16,20,25,26]

In this study, maternal age, education, and parity were determinants of knowledge of obstetric danger signs. Pregnant mothers aged 25–34 years were more likely than other age groups to be knowledgeable of obstetric danger indicators. This result is consistent with results from other studies that have been done in Arbaminch, Wolayita Sodo, and Yirgacheffe Towns, South Ethiopia, and South Eastern Nigeria. Women in this age category are believed to be physically and psychologically ready to accept information about obstetric danger signs. This result contradicts a study conducted in the Eastern Democratic Republic of the Congo that found women aged 30–39 years were more likely than other age groups to be knowledgeable of obstetric danger indicators.[16,20,26,28,30] The multivariate logistic regression revealed that the knowledge of obstetric danger signs among pregnant women was associated with parity. The probability of knowing obstetric danger signs decreased by 53% among primipara mothers compared to nullipara mothers. This finding contradicts the finding reported in Eastern Democratic Republic of the Congo.[25] However, it is consistent with the results reported in other studies.[26,29,31]

In this study, the mean score of attitude towards skilled delivery service utilization was 30.4. More than half of the study participants 337 (50.4) had a positive attitude towards skilled delivery service utilization. This finding was lower than the finding reported in Oromia Region, Ethiopia (61.2%).[32] Our finding is higher than the result reported in Northwest Ethiopia (28.3%).[33] A possible explanation could be differences in study setting and health program implementation. This study revealed that pregnant mothers with a high perception of pregnancy risk were more likely to have a positive attitude toward skilled delivery service utilization than pregnant mothers with a low pregnancy risk perception. This is because having risk perception could develop a positive attitude towards health service utilization. The utilization behavior of individuals is driven by their perception to develop a positive attitude and take over the action.[34] It was also observed that pregnant mothers who were multiparous were more likely to have a positive attitude towards skilled delivery service utilization than nulliparous pregnant mothers. This may be because pregnant mothers who experienced previous births were more likely to benefit from maternal health services and learn from their experiences.

The results of this study have important policy implications. Determining the level of the pregnancy risk perception, knowledge of obstetric danger signs and attitude of pregnant women towards skilled delivery service utilization can predict their preventive practice, and identifying variables is crucial for developing appropriate risk communication methods and measures.

Limitations

Regarding limitations of this study, bias might be provoked in prompting the participants to mention the danger signs, though the authors tried their best to avoid it. In addition, reports of the pregnant mothers may under/overestimate the result because the data was collected by self-report.

Conclusion

In this study, pregnancy risk perception, attitude towards skilled delivery service utilization, and level of pregnant women's knowledge of obstetric danger indicators in Lemo and Ameka Districts of Hadiya Zone were low. Maternal age, maternal education, and parity of the respondents were determinants of knowledge of obstetric

danger signs. It was also observed that perception of pregnancy risk and parity were significantly associated with attitude towards skilled delivery service utilization. Based on the findings of this study, we recommend that stakeholders of the health sector develop a strategic plan to increase pregnancy risk perception, pregnant women's knowledge of obstetric danger indicators and develop a positive attitude towards skilled delivery service utilization to reduce maternal death through the provision of health education and health promotion.

Ethics Approval and Consent to Participate

This study has been approved by the Institutional Review Board of the Jimma University (Ref no: JUIH/IRB223/22). Permission letter was obtained from respective health departments. An information sheet including the purpose and importance of the study, confidentiality of the participant's response, and study benefits and risks was prepared and explained to the study participants. Informed, voluntary, written, and signed consent was sought from women aged ≥18 years. For those aged <18 years, parental informed consent was obtained as per the approval by the ethical review committee. For the participants who were unable to read and write, the informed consent was read by the data collectors to them and put their fingerprints on the consent form of their agreement. Confidentiality of data was guaranteed by using identification numbers rather than names and limiting access to the data. Finally, the study was conducted per the declaration of Helsinki.

Acknowledgments

To the best of the authors' knowledge, this is the first study to assess pregnant mothers' pregnancy risk perception, attitude towards skilled delivery service utilization, and level of knowledge of obstetric danger signs in rural areas in the study area. This study was conducted in a large sample of participants. It was a community-based study in a rural setting which makes it a representation of the true population.

The authors would like to thank the study participants, supervisors and data collectors.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Funding

This research work was funded by Jimma University. The funders had no role in study design, data collection, and analysis, decision to publish, or preparation of the manuscript.

Disclosure

The authors report no conflicts of interest for this work.

References

1. WHO. *Trends in Maternal Mortality: 2000 to 2017: Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division*. Geneva; 2019.
2. Adedini SA, Babalola S, Ibeawuchi C, et al. Role of religious leaders in promoting contraceptive use in Nigeria: evidence from the Nigerian urban reproductive health initiative. *Global Health*. 2018;6(3):500–514. doi:10.9745/GHSP-D-18-00135
3. Kanmaz AG, İnan AH, Beyan E, et al. Effect of advanced maternal age on pregnancy outcomes: a single-centre data from a tertiary healthcare hospital. *J Obstetrics Gynaecol*. 2019;39(8):1104–1111. doi:10.1080/01443615.2019.1606172
4. Lee S. Risk perception in women with high-risk pregnancies. *Br J Midwifery*. 2014;22(1):8–13. doi:10.12968/bjom.2014.22.1.8
5. Mwilike B, Nalwadda G, Kagawa M, et al. Knowledge of danger signs during pregnancy and subsequent healthcare seeking actions among women in Urban Tanzania: a cross-sectional study. *BMC Pregnancy Childbirth*. 2018;18(1):1–8. doi:10.1186/s12884-017-1628-6
6. Agunwa CC, Nnebue CC, Duru CB, et al. Knowledge of obstetric danger signs among women of reproductive age in rural communities in Enugu State, Nigeria. *Am J Health Res*. 2015;3(6):376–380. doi:10.11648/j.ajhr.20150306.20
7. Rogo K, Aloo-Obungu C, Ombaka C, et al. Maternal mortality in Kenya: the state of health facilities in a rural district. *East Afr. Med. J.* 2001;78(9):468–472. doi:10.4314/eamj.v78i9.8977
8. Wajid A, Rashid Z, Mir AM. Initial assessment of community midwives in rural Pakistan. JSI Research and Training Institute; 2010.

9. ICF, E.P.H.I.E.a. *Ethiopia Mini Demographic and Health Survey 2019: Final Report*. Rockville, Maryland, USA: EPHI and ICF.; 2021.
10. Baltimore M. *JHPIEGO. Pregnancy and Child Birth. Danger Signs of Pregnancy*. Johns Hopkins Center for Communication Programs; 2015:15–16.
11. Heaman MI, Gupton AL. Psychometric testing of the perception of pregnancy risk questionnaire. *Res Nursing Health*. 2009;32(5):493–503. doi:10.1002/nur.20342
12. Sangin S, Phonkusol C. Perception of pregnancy risk and related obstetric factors among women of advanced maternal age. *Pacific Rim Int J Nursing Res*. 2021;25(3):494–504.
13. Bililign N, Mulatu T. 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*. 2017;17(1):1–7. doi:10.1186/s12884-017-1253-4
14. Maternal J. *Neonatal Health: Monitoring Birth Preparedness and Complication Readiness, Tools and Indicators for maternal and Newborn Health. Johns Hopkins, Bloomberg School of Public Health*. Center for communication programs, Family Care International; 2004.
15. *United Nations Department of Economic and Social Affairs, Population Division. World Population Prospects 2022: Summary of Results*. 2022. *UN DESA/POP/2022/TR/NO. 3*.
16. Ossai E, Uzochukwu B. Knowledge of danger signs of pregnancy among clients of maternal health service in urban and rural primary health centres of Southeast Nigeria. *J Community Med Health Educ*. 2015;5(337):2161–2711. doi:10.4172/2161-0711.1000337
17. Maseresha N, Woldemichael K, Dube L. Knowledge of obstetric danger signs and associated factors among pregnant women in Erer district, Somali region, Ethiopia. *BMC Women's Health*. 2016;16(1):1–8. doi:10.1186/s12905-016-0309-3
18. Alemu DA, Zegeye AM, Zeleke LB, et al. Pregnancy Risk Perception and Associated Factors among Pregnant Women Attending Antenatal Care at Health Centers in Jabi Tehnan District, Amhara, Northwestern Ethiopia, 2021. *Int J Reproductive Med*. 2022;2022:1–9. doi:10.1155/2022/6847867
19. Bayrampour H, Heaman M, Duncan KA,, et al. Comparison of perception of pregnancy risk of nulliparous women of advanced maternal age and younger age. *J Midwifery Women's Health*. 2012;57(5):445–453.
20. Hibstu DT, 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(1):1–9. doi:10.1186/s13690-017-0203-y
21. Thaddeus S, Maine D. Too far to walk: maternal mortality in context. *Soc sci med*. 1994;38(8):1091–1110.
22. Kabakyenga JK, Östergren P-O, Turyakira E, et al. Knowledge of obstetric danger signs and birth preparedness practices among women in rural Uganda. *Reproductive Health*. 2011;8(1):1–10. doi:10.1186/1742-4755-8-33
23. Desta H, Hailemariam B. Knowledge about obstetric danger signs and associated factors among mothers in Tsegedie District, Tigray Region. *Ethiopia J Health Dev*. 2013;12(1):36–37.
24. Demissie E, Dessie F. Level of awareness on danger signs of pregnancy among pregnant women attending antenatal care in Mizan Aman General Hospital, Southwest, Ethiopia: institution based cross-sectional study. *J Womens Health Care*. 2015;4(08):288. doi:10.4172/2167-0420.1000288
25. Imani Ramazani BE, Mabakutuvangilanga Ntala SD, Katuashi Ishoso D, et al. Knowledge of Obstetric Danger Signs among Pregnant Women in the Eastern Democratic Republic of the Congo. *Int J Environ Res Public Health*. 2023;20(8):5593.
26. Bolanko A, Namo H, Minsamo K, et al. 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*; 2021;9:20503121211001161
27. Okour A, Alkhateeb M, Amarin Z. Awareness of danger signs and symptoms of pregnancy complication among women in Jordan. *Int J Gynecol Obstetrics*. 2012;118(1):11–14. doi:10.1016/j.ijgo.2012.01.020
28. Bintabara D, Mpembeni RN, Mohamed AA. Knowledge of obstetric danger signs among recently-delivered women in Chamwino district, Tanzania: a cross-sectional study. *BMC Pregnancy Childbirth*. 2017;17(1):1–10. doi:10.1186/s12884-017-1469-3
29. Woldeamanuel GG, Lemma G, Zegeye B. Knowledge of obstetric danger signs and its associated factors among pregnant women in Angolela Tera District, Northern Ethiopia. *BMC Research Notes*. 2019;12(1):1–6.
30. Wassihun B, Negese B, Bedada H, et al. Knowledge of obstetric danger signs and associated factors: a study among mothers in Shashamane town, Oromia region, Ethiopia. *Reproductive Health*. 2020;17(1):1–8.
31. Hamad KK. *The Association Between Antenatal Attendance and Knowledge on Obstetric Danger Signs Among Postnatal Mothers in Zanzibar: A Community Based Cross-Sectional Study*. The University of Dodoma; 2019.
32. Girmaye E, Mamo K, Ejara B, et al. Assessment of knowledge, attitude, and practice of skilled assistance seeking maternal healthcare services and associated factors among women in West Shoa Zone, Oromia region. *Ethiopia Nursing Res Practice*. 2021;2021:1–11. doi:10.1155/2021/8888087
33. Ayana A, Kassie A, Azale T. Intention to use institutional delivery service and its predictors among pregnant women, North West Ethiopia: using theory of planned behavior. *PLoS One*. 2021;16(5):e0248697. doi:10.1371/journal.pone.0248697
34. Nigusie A, Azale T, Yitayal M, et al. The impact of perception on institutional delivery service utilization in Northwest Ethiopia: the health belief model. *BMC Pregnancy Childbirth*. 2022;22(1):1–12. doi:10.1186/s12884-022-05140-w