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Prevalence and Associated Factors with Maternal Delays in Seeking Emergency Obstetric Care in Arsi Zone, Oromiya, Ethiopia Cross-sectional Study Design

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Abstract

Objective: To determine the prevalence and associated factors with the maternal delay in seeking emergency obstetrics services among pregnant women, Arsi Zone, Oromiya, Ethiopia, 2016.

Methods: A Facility based Cross-sectional study design using a quantitative method was conducted at public health facilities of Arsi Zone. Sample size, 847 was determined using a single population proportion formula. A total of 10 health centers which provide obstetric care selected randomly and sample size proportionally allocated to each facility. Data entered in Epi Info version 3.3.2 software and exported to SPSS version 20 for statistical analysis. P<0.05 considered to declare a statistically significant variable with a 95% confidence interval.

Result: From the total 775 participants, 203 (27.2%) of the respondents reported that they faced problem in making a decision to seek emergency obstetric care. The mean time for delay was 90 minutes with a range of 30 minutes to 18 hours. Maternal age, educational level, monthly income, and ANC follow up status were significant predictors of maternal delay in seeking emergency obstetric care.

Conclusion: Husbands took the lines to share in making the decision to seek obstetric care. This implies independent decision-making power of women on their own health is low. In order to address maternal delay one health extension workers along with health centers staffs, district officers and programmers should give emphasis for awareness creation, income generating mechanism and capacitating decision making the power of mothers need to be strengthened and expanded in the community.

Keywords: Delay; Seeking; Obstetric; Care; Emergency; Arsi zone; Spss, Health center

List of abbreviations ANC: Antenatal Care; AOR, Adjusted Odds Ratio; ETB: Ethiopian Birr; EOC: Emergency Obstetric Care; MMR: Maternal Mortality Rate; OR: Odds Ratio; SDG: Sustainable Development Goal; SPSS: Statistical Package for Social Sciences; TBA: Traditional Birth Attendance; WHO: World Health Organization

Introduction

Many mothers living in developing countries continue to die from pregnancy-related morbidities each year [1,2]. Maternal mortality has been identified as a priority on health policy and research agendas for developing countries [3,4]. In many low-and-middle-income countries, death rates related to pregnancy are often high and have an impact on reproductive-aged women. However, these deaths are mostly avoided by timely and adequate treatment [5].

The Three Delays is a model originally developed in the 1990s as a way to understand the environment surrounding maternal mortality and has been used in countries across the world to understand and improve maternal mortality [6,7]. Maternal delays were described as having three levels which have been named first, second, and third maternal delays respectively [8].

The first delay is on the part of the mother, family, or community not recognizing a life-threatening condition. Because most deaths occur during labor or in the first 24 hours postpartum, recognizing an emergency is not easy. Most births occur at home with unskilled attendants, and it takes skill to predict or prevent bad outcomes and medical knowledge to diagnose and immediately act on complications [8,9].

The second delay is in reaching a health-care facility and may be due to road conditions, lack of transportation, or location. The third delay occurs at the healthcare facility [8-12].

Women and their families face socioeconomic and cultural barriers for seeking professional delivery care, such as high costs, long distances to health facilities, lack of knowledge about danger signs during pregnancy, and a tradition of using untrained local practitioners during delivery [11,12]. Maternal delay is one of the contributing factors for high maternal mortality in developing countries. For example, an inability to recognize an emergency may extend the delay in the decision to seek care. While the ability of the patient or a caregiver to recognize an emergency is partially dependent upon the patient's or caregiver's level of education [7].

To improve medical care in obstetric emergencies, appropriate timing is extremely important. Providing timely treatment for obstetric emergencies, increasing women's access to and use of facilities for childbirth is a critical national strategy to improve maternal health outcomes in Ethiopia [13].

Though studies were done in different countries and regions, there was no such kind of study conducted in the area. Therefore; with this paper we aimed, to examine the prevalence and associated factors with the maternal delay in seeking emergency obstetric care.

Literature Review

Prevalence of maternal delay in seeking obstetrics care

A study conducted in Bahir Dar by Awoke and Seleshi, K notified that First delay, (37.8%) of mothers was delayed in decision making for seeking care from the public health facility and the mean delay was 8 hours [14].

The observational cross-sectional study was conducted from January 2010 to December 2015 in Surat Municipal Institute of Medical Education and Research (SMIMER). The factors associated with maternal deaths were classified by using the 'three delays' framework revealed that 35.05%.

Women had not taken any ANC care and the 1st delay was found in 57.73% cases [15]. Another study in Tanzania revealed from the woman's side 73.3% delay in seeking care and 11.1% complete lack of antenatal care as a main factor for maternal delay one [16].

Factors associated with maternal Delay one: recognizing the need and making the decision to seek care

In the study conducted in Bahir dar, maternal delay in seeking EOC was 3.94 times higher among unemployed mother (AOR, 3.94; 95%CI, 2.36-6.57) than employed ones; was 6.71 fold higher in illiterate mothers (AOR, 6.71; 95%CI, 3.66-12.29) than literate mothers. Delay in seeking EOC was 2.75 times higher among mothers whose monthly income below 1000.00 ETB (AOR, 2.75; 95% CI, and 1.347-5.644) than whose monthly income 2000.00 ETB and above. Mother who had been influenced by her husband was 2.19 times higher in having a delay (AOR, 2.19; 95%CI, and 1.25-3.85) than mothers who made decisions by their own. The odds of a delay in seeking EOC was 4.51 times higher among mothers who had not ANC follow up (OR, 4.51; 95% CI, 2.45-8.30) than mothers who had ANC follow up during their pregnancy [17].

One study in Egypt revealed that, in about two-thirds of the cases (65%), it took 2-7 days while, in another quarter of cases, it took more than a week to recognize the complications that led to subsequent deaths. Of those cases where the complications were recognized, only 64% had decided to seek care. Moreover, only 28% of those who had decided to go for treatment had decided to seek treatment from a health facility. The data further reveal that, in almost two-thirds of the cases, the time elapsed between realizing a complication and seeking help was more than one complete day [18].

The Objective of the Study

General objective

The objective of this study was to determine the magnitude and factors associated with a delay in seeking emergency obstetrics service among women in Arsi zone health facilities.

Specific objective

- To calculate the magnitude of maternal delay in seeking emergency obstetric care
- To assess factors associated with a maternal delay in seeking emergency obstetric care

Research Methods

Study design and period

A Facility based Cross-sectional study design using a quantitative method was conducted among mothers coming for receiving obstetric services at public health facilities of Arsi zone, Ethiopia, from October 15 to December 30, 2016, G.C.

Study area

This study was conducted in Arsi zone, Oromia region, which is situated to South- East of Ethiopia. Asella is the capital town of Arsi zone located at an altitude of 2247.25 meters above sea level, 175 km away from Addis Ababa the capital city of Ethiopia, and 75 km away from Adama, the regional city of Oromia. The zone has a total population of 3,280,154 of whom 725,898 were childbearing ages.

The majority of the inhabitants belong to the Oromo ethnic group, with small proportions of other ethnic origins. The major occupations range from farming to civil service.

Population

Source population

All pregnant, laboring and post-natal mothers coming for emergency obstetric care in selected health facilities of Arsi zone as of October to December 30, 2016.

Study population

Sampled pregnant, laboring and postnatal mothers who came for receiving emergency obstetric care in selected health facilities within the study period

Inclusion Criteria

Women who came to receive delivery service/obstetric care in the selected health facilities of Arsi zone starting from October 15 to December 30, 2016, G.C.

Those who were willing to give informed verbal consent for face to face interview were included in the study.

Exclusion Criteria

Who were not conscious or unable to communicate were not included in the study. Women who were admitted for the second time developing obstetric complication once they have been studied.

Women who transferred from the health center to another health center once they have been studied Figure 1.

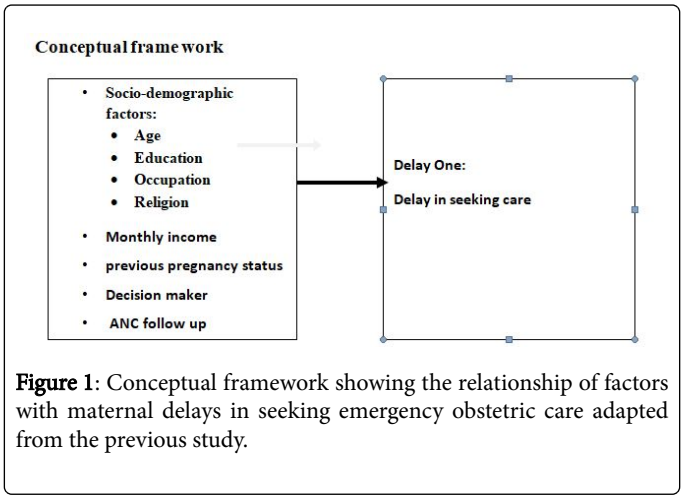

Figure 1: Conceptual framework showing the relationship of factors with maternal delays in seeking emergency obstetric care adapted from the previous study.

Sample Size

The sample size was determined by using a single population proportion formula by considering the following assumptions:

$$n=Z^2p(1-p)$$

$$d^2$$

$$n= (1.96)^{2*}0.5(1-0.5)$$

$$(0.05)^2$$

Where:

n = sample size;

Z= standard normal distribution which is 1.96.

E =is the margin of error in the study which is 0.05.

P=percentage of women who encountered all level of delay 50% (No previous study in the area).

The sample size (n), using the above-mentioned formula yields 384.

Therefore considering the design affect the total sample size for this study was 384 × 2= 768 +79=847 (with 10% non-response rate).

Sampling Technique

A multistage sampling technique was used to select the study population. Initially, 10 districts were selected. Then a total of 10 (one health centers per district) which provide comprehensive obstetric care was selected randomly. After the selection of these facilities, the sample size (847) of the study was proportionally allocated to each selected facilities based on their total recent 6-month delivery coverage. The sampling technique used to draw randomly the study subjects was systematic sampling techniques using K=N/n where K is the sample interval, N is the total number of delivery cases during the study season and n is the required sample size Figure 2.

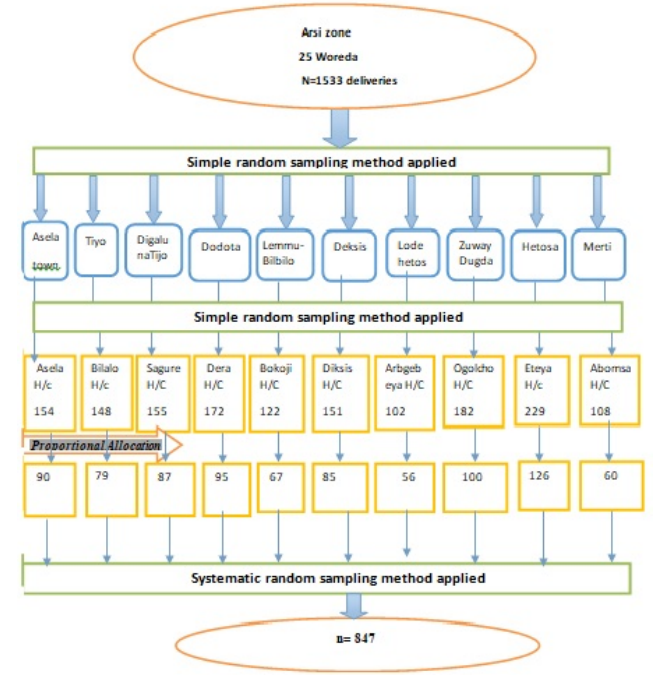

Figure 2: Sketch of the multistage sampling procedure.

Data Collection Tool and Procedures

Data collection tool

A questionnaire was developed from related research literature and validated by experts to fit with the local context for data collection.

Data collection procedures

For data collection 10 data collectors who had at least diploma level educational status that have health professional backgrounds and able to communicate with both Afaan Oromo and Amharic were recruited. 2 days training was given for all data collectors on the procedure, objective, confidentiality, respondent's right and informed consent. The principal investigator and the co-investigators supervise the overall processes of data collection. All the questionnaires were checked for completeness, logical errors, unclear or irrelevant information on a daily basis during the process of data collection. Validity and consistency of the questionnaire were assured by conducting a pilot study ahead of the actual data collection period on 5% of the total sample size (n=42) who live out of sampled areas.

Study Variables

Dependent variable

- Maternal delay in seeking emergency obstetric care

Independent variables

- Age
- Occupation
- Education
- Religion
- Monthly income
- Decision maker for obstetric care
- Consultation before obstetric care
- ANC follow up

Operational definitions

- **Maternal delay in seeking emergency obstetric care (delay one):** dalliance related to respondent's health-seeking behavior as evidenced by the respondent self-report considering the gap between the onset of symptoms of obstetric problems and decision making for seeking obstetric care
- **Emergency Obstetric care**: A care given to a pregnant, laboring or postpartum woman with emergency medical, surgical or obstetrical problems

Data Quality Assurance

The questionnaire was prepared in the English version and translated into 'Afan Oromo and Amharic' local language and back to English by language experts for consistency. Internal validity was assured by incorporating senior's comments. Two days training was given for data collectors and supervisors by investigators to have a consistent understanding of the checklist and its procedures. The questionnaire was pre-tested among 5% of the calculated sample size outside the study hospitals.

Data Analysis and Statics

The data was checked in the field to ensure that all the information if properly collected and recorded. Epi Info version 3.3.2 software was employed for data entry and the entered data was exported to SPSS version 20 software for statistical analysis. Descriptive statistics for percent mean and the standard deviation was computed. First, a bivariate logistic regression analysis was computed for each independent variable with the dependent variable. Not to miss important variables, those with p-value<0.2 at bivariate logistic regression analysis were transferred to the multivariable logistic regression model to identify independent predictors of maternal delays (outcome variable). $p<0.05$ was considered statistically significant with 95% confidence interval.

Ethical Consideration

This study complied with standard protocols for research ethics that means approval from Arsi University, ethical and review committee. Consent from Oromia region research and ethical review committee, Zonal health bureau, responsible bodies of the respected health units and consent from study subjects was obtained.

Result

Socio-demographic characteristics of the respondents

Eight hundred forty-seven subjects were planned for an interview to be a participant of this study and 775 of them gave their oral consents and interviewed, giving a response rate of 91.5%. 0ut of the total respondents, 666 (85.9%) were found within the age range of 20-34 years and the mean age is 27.2 with STD+4.9, 685 (88.4%) were married and 192 (28.4%) were completed their primary education. The dominant, 360 (46.8%) were Orthodox in religion, with regard to their parity 618 (79.4%) were Para 1-4, 543 (70.1%) were housewives. The majority of respondents 391 (50.5%) had a monthly income of 500-1000 E.C. and 643 (83%) of the women had ANC follow up for the recent pregnancy Table 1.

Variables		Frequency	Percent
Age	15-19	42	5.4
	20-34	666	85.9
	>35	67	8.6
	Total	775	100
Marital status			
	Single	48	6.2
	Married	685	88.4
	Divorced	30	3.9
	Widowed	12	1.5
	Total	775	100
Religion	Orthodox	360	46.5
	Protestant	156	20.1
	Catholic	18	2.3
	Muslim	241	31.1
	Total	775	100
Occupation	Housewife	543	70.1
	Goven't employee	99	12.7
	Self-employed	97	12.5
	Others	36	4.7
	Total	775	100
Parity	0	36	4.6
	01-Apr	618	79.7
	>5	121	15.6
	Total	775	100
Educational status			
	Illiterate	187	24.1

	Only read and write	186	24
	Primary	192	24.8
	Secondary	150	19.4
	Tertiary	60	7.7
	Total	775	100
Monthly family income in ETB			
	<500	252	32.5
	500-1000	391	50.5
	1001-1900	54	7
	>2000	78	10
	Total	775	100
ANC follow up	Yes	643	83
	No	132	17
	Total	775	100

Table 1: Socio-demographic, economic characteristics and ANC status of respondents, In Arsi zone, 2016 G.C (n=775).

The magnitude of maternal delay in seeking care

From the total respondents, 203 (27.2%) of the clients reported that they faced problem on making the decision to seek emergency obstetric care. The mean time for delay was estimated to be 11/2 hours with a range of 30 minutes to 18 hours. 412 (53.2%), 234 (30.2%), 79 (10.1%) of study participants reported that decision for seeking obstetric care at health center was made by the woman's husband, the woman herself, other family members and her neighbors respectively. 613 (79%) of respondents had a consultation with TBAs and other health facilities before coming to the health centers where they received the obstetric care and the remaining 162 (21%) had no consultation with the aforementioned agents Figure 3.

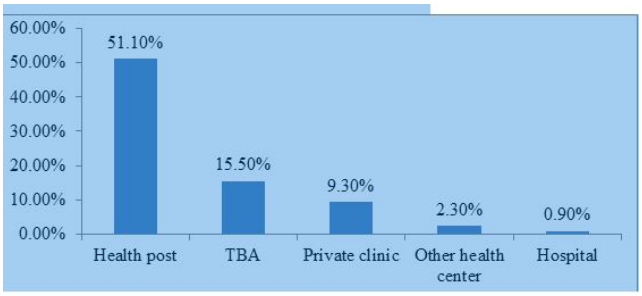

Figure 3: Consultation with service providing agencies before receiving obstetric care in Arsi Zone health centers, 2016 G.C.

Factors associated with a maternal delay in seeking delivery service

For those factors significant at P-value<0.2 in the bi variate analysis, multi variate logistic regression was carried out to predict the first maternal delay in seeking obstetric care with associated variables. Marital status, parity and consultation with TBA and Health facility before the decision to seek care had no significant association with maternal delay one i.e delay in seeking obstetric care. However; Maternal delay in seeking obstetrics care was about 2.1 times higher among mothers whose age was 20-34 years (AOR, 2.1; 95% CI, 1.8, 5.2) and 4.1 times higher among mothers whose age was 35-49 years (AOR, 4.1; 95% CI, 2.4, 2.5) than those mothers whose age 15-19 years.

Variable		Maternal delay		Crude OR (95% CI)	Adjusted OR (95% CI)
		Yes	No		
Age	15-19	21	19	1	1
	20-34	513	176	1.9 (1.1, 2.3)	2.1 (1.8, 5.2)*
	35-49	28	8	2.5 (1.7, 5.6)	4.1 (2.4, 10.5)*
Marital status	Single	13	45	2.9 (1, 5, 4.2)	09 (0.6, 7.2)
	Married	576	114	2 (0.9, 11, 3)	3.6 (1.4, 12.3)
	Divorced	3	41	1.3 (1.0, 2.1)	2.3 (0.9, 6.2)
	Widowed	9	3	1	1
Educational status	Illiterate	151	35	3.8 (2.1, 5.4)	5.2 (3.46, 11.9)*
	Only read and write	129	58	1.7 (0.8, 3.4)	2 (1.0, 13.7)
	Primary education	138	54	1.3 (0.4, 5.0)	2 (0.9,7.5)
	Secondary education	100	50	0.7 (0.8, 1.4)	1.2 (1.1, 6.7)
	Tertiary education	54	6	1	1

Occupation	House wife	438	119	5.3 (3.1, 11.9)	3.1 (1.5, 7.2)*
	Goven't employee	77	30	2.2 (1.8, 5.0)	2.1 (0.9, 3.8)
	Self Employee	65	36	3.0 (1.2, 5.3)	2.4 (0.7, 3.3)
	Other	23	18	1	1
Monthly family income	<500	176	69	2.8 (1.1, 3.8)	2.5 (1.5, 6.3)*
	500-1000	287	106	2.2 (1.1, 3.8)	1.8 (0.7, 4.1)
	1001-1900	40	16	1.6 (1.20, 3.45)	1.3 (0.5, 3.4)
	>2000	68	12	1	1
ANC follow up	Yes	84	160	1	1
	No	188	143	2.8 (2.3, 5.3)	4.0 (3.3, 9.1)*
Decision maker for obstetric care	Woman her self	147	87	3.0 (1.8, 5.0)	2.1 (1.2, 3.8)*
	Her husband	314	98	5.3 (3.2, 13.3)	2.1 (0.8, 5.2)
	Others	111	18	4.4 (1.1, 9.5)	1.8 (0.5, 2.2)

Table 2: Maternal delay in seeking emergency care and associated factors, at Arsi Zone 2016 G.C (n=775).

Illiterate mothers had about 5.2 times higher chance of delay in seeking obstetric cares (AOR, 5.2; 95% CI, (3.4, 11.9)) than those who completed tertiary level education. Housewives had about 3.1 fold higher occurrence of delay one (AOR, 3.1; 95% CI, 1.5, 7.2) than others (students).

The odds of a delay in seeking obstetrics care was 2.5 times higher among mothers whose monthly income <500 ETB (AOR, 2.5; 95% CI, 1.5, 6.3) than whose monthly income>2000.00 ETB.

Maternal delay one was about 4.1 times higher among mothers who had no ANC follow up (AOR, 4.1; 95% CI, 3.3, 9.1) than those mothers who had ANC follow up. Maternal delay in seeking obstetrics care was about 2.1 folds higher when the decision to seek care was made by the woman herself (AOR, 2.1; 95% CI, 1.2, 3.8) than a decision made by others like other family members and neighbors Table 2.

Discussion

In this study, 27.2% of the respondents reported that they faced problem on making the decision to seek emergency obstetric care with a mean delay of 90 minutes. This is lower than a study conducted in Bahir Dar showing that 37.8% of mothers with a mean delay of 8 hours (5) and Surat Municipal Institute of Medical Education and Research (SMIMER) indicating 57.73% cases delayed in decision making for seeking care [18]. Still much lower than the study in Tanzania showing 73.3% delay in seeking care.

Surprisingly, 412 (53.2%) of study participants reported that decision for seeking obstetric care at the health center was made by their husband. Given that the majority (83%) of the respondents had ANC follow up with expected knowledge about labor and emergency signs better than their husbands, the decision for seeking care was decided by husbands. This shows that decision-making for use of obstetric care in the family follows the logic of the family's management.

With respect to ANC, in this study, 17% of respondents have no followed up. This is lower than the study conducted in Surat Municipal Institute of Medical Education and Research (SMIMER) revealing 35.05% but higher than the study in Tanzania indicating 11.1 % of respondents lacked of antenatal care follow up.

In this study maternal age, educational level, monthly income, and ANC follow up were significant predictors of maternal delay in seeking emergency obstetric care. This is consistent with a study conducted in Bahirdar where educational level, monthly income, and ANC follow up status were significant for maternal delay one [18].

Generally, in our study, delay in seeking emergency obstetric care was reported by 27% of the respondents.This is lower than the study conducted in a public-sector tertiary teaching hospital where maternal delay one was reported by 71% of respondents.

Conclusion

Husbands took the lines to share in making the decision to seek obstetric care. This implies independent decision-making power of women on their own health is low.

The decision to seek care was significantly higher among elderly women, literate mothers, monthly family income >500 ETB and women who had ANC follow up. In general, in order to address maternal delay one health extension workers along with health centers staffs, woreda officers and programmers should give emphasis for awareness creation, income generating mechanism and capacitating decision making the power of mothers need to be strengthened and expanded in the community.

Limitation of the Study

Unable to avoid recall bias since time calculation for delay one was collected from the respondents during the exit interview.

Author's Contribution

All three authors participated in the design and analysis of the study. Yirga Wondu searched the data bases and wrote the first and the second draft of the article. All the three authors took a part in reviewing the whole process of the research article (manuscript) and approved for the final version.

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