Research Article

Factors Associated with Men's Awareness of Danger Signs of Obstetric Complications and Its Effect on Men's Involvement in Birth Preparedness Practice in Southern Ethiopia, 2014

Alemu Tamiso Debiso,¹ Behailu Merdekios Gello,¹ and Marelign Tilahun Malaju²

¹Department of Public Health, College of Medicine and Health Science, Arba Minch University, Arba Minch, Ethiopia

²Department of Public Health, College of Health Sciences, Debre Tabor University, Debre Tabor, Ethiopia

Correspondence should be addressed to Alemu Tamiso Debiso; tamisodebiso@gmail.com

Received 3 July 2015; Revised 31 August 2015; Accepted 12 October 2015

Academic Editor: Guang-Hui Dong

Copyright © 2015 Alemu Tamiso Debiso et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Background. Compared to average maternal mortality ratio of 8 per 100,000 live births in industrialized countries, Ethiopia has an estimated maternal mortality ratio of 676 per 100,000 live births. Maternal deaths can be prevented partially through increasing awareness of danger signs of obstetric complications and involving husbands (male) in birth preparedness practice. **Methods.** Community based cross-sectional study was done. All adult males with a wife or partner who lives in the selected kebeles were our study population. Data was collected by pretested and structured questionnaires and two-stage cluster sampling procedure was used in order to collect study samples. Data was cleaned and entered into Epi Info 7 and exported to SPSS (IBM-21) for further analysis. Ordinary and hierarchical logistic regression model were used and AOR with 95% CI were used to show factors and the effect of men's awareness of danger sign on men's involvement in birth preparedness practice. **Results.** Total numbers of men interviewed were 836 making a response rate of 98.9%. 42% of men had awareness of danger sign and 9.4% (95% CI: (7.42, 11.4)) of men were involved in birth preparedness practice. Respondents who live in the rural area [(AOR: 8.41; (95% CI: (4.99, 14.2))], governments employee [(AOR: 3.75; (95% CI: (1.38, 10.2))], those who belong to the highest wealth quintile [(AOR: 3.09; (95% CI: (1.51, 6.34))], and husbands whose wives gave birth in the hospital [(AOR: 2.09; (95% CI: (1.29, 3.37))], health center [(AOR: 1.99; (95% CI: (1.21, 3.28))], and health post [(AOR: 2.2; (95% CI: 2.16 (1.06, 404))] were positively associated and those who had no role in the health development army [(AOR: 0.43; (95% CI: (0.26, 0.72))] were negatively associated with men's awareness of danger signs of obstetric complications. **Conclusion.** The prevalence of men awareness of danger sign was low and male involvement in birth preparedness practice was very low. Since there is a low level of awareness (17.1%) particularly in the urban area and men act as gatekeepers to women's health, the respective organization needs to review urban health extension program and give due emphasis to husband education in order that they are able to recognize danger signs of obstetric complications in a way to increase their involvement in birth preparedness practice.

1. Introduction

Compared to the average MMR of 8 per 100,000 live births in industrialized countries, Ethiopia has an estimated MMR of 676 per 100,000 live births, which is the greatest contribution for maternal mortality that occurs worldwide [1, 2].

Globally there are five obstetric causes that lead to four-fifths of maternal deaths; those are divided into direct causes (severe bleeding, sepsis, unsafe abortion, hypertensive disorder of pregnancy, obstructed labor, and other causes like

ectopic pregnancy, embolism) and indirect causes (malaria, anemia, and heart diseases) [3]. The preventable ones are prevented and controlled partially by increasing awareness of the signs and symptoms of obstetric complications and timely access to appropriate emergency obstetric care, even in the poorest communities [4].

The birth plan is also a very important strategy in developing countries where obstetric services are weak and thus contribute significantly to maternal and neonatal morbidity and mortality [5]. The key elements of the birth plan include

a plan for skilled birth attendants, place of delivery, and arrangement of money for transport or other costs [6]. In Ethiopia, a husband at an antenatal clinic is rare in many communities and it is unthinkable to find men accompanying their partners during antenatal care and delivery [7].

In Ethiopia the top four causes of maternal mortality in the last decade were obstructed labor/uterine rupture (36%), hemorrhage (22%), hypertensive disorders of pregnancy (19%), and sepsis/infection (13%) [8, 9]. With understanding of unacceptable death due to common obstetric complications, the Ethiopian government has expressed its commitment to improving maternal health and reducing maternal mortality by three-quarters (MDG5), by launching innovative health extension program (HEP) [10]. Since the government's introduction of this new health program in 2003, individual counseling about danger signs of obstetric complications and birth preparedness have been emphasized. Furthermore, those women identified as being "at risk" of a complicated birth can be advised to give birth at a healthcare facility or government hospital, having a health worker with midwifery skills, and this is now seen as one of the most critical interventions for making motherhood safer [11–13].

However, the majority of women in Ethiopia have poor status in society and lack decision-making power, a factor that can contribute significantly to adverse pregnancy outcomes [14]. Studies in Africa, particularly in Ethiopia, have found that husbands and other family members often make the decision about where a woman will deliver [15, 16], and although it is unlikely that men are actively ignoring the signs of complications during pregnancy and labor, it is possible that they lack awareness of what to look for, thereby hindering their ability to judge when emergency actions must be taken. If men are acting as gatekeepers to women's health, it is of paramount importance if they are able to recognize the danger signs of obstetric complications and be involved in birth preparedness practices [17]. The aim of this study therefore was to determine factors associated with men's awareness of danger signs of obstetric complications and its effect on men's involvement in birth preparedness practice at Chencha district of Gamo Gofa Zone, southern Ethiopia, 2014.

2. Method and Materials

2.1. Study Area and Period. The study was conducted in Chencha district of Gamo Gofa Zone of southern Ethiopia. It is located 562 Km southwest of the capital city of Ethiopia, Addis Ababa, and 295 Km southwest of the regional capital, Hawassa, with a total population of 137,196 and estimated women with child bearing age of 31,966. The district has 50 kebeles, five urban and 45 rural, with 27,999 households until the end of 2013. The district has one primary hospital, six health centers, and 50 health posts. The study was conducted from April to May 2014.

2.2. Study Design. Community based cross-sectional study was implemented.

2.3. Study Population. All adult males with a wife or partner who live in the selected kebeles and participants with a wife or partner who had been through childbirth in the preceding 36 months were study population and included in the study, respectively.

2.4. Sample Size and Sampling Procedures

2.4.1. Sample Size Determination. The required sample size was determined by using StatCalc program of the Epi Info version 7; five percent desired precision, 95% confidence level, 50% men awareness of danger signs of obstetric complications (due to absence of previous finding on men in Ethiopia), ten percent of nonresponse rate, and design effect of two were considered which resulted in 845 study participants.

2.4.2. Sampling Procedures. Two-stage cluster sampling technique was used to reach household level. The district was stratified into urban and rural area; then nine kebeles from urban and one kebele from rural area were selected by simple random sampling considering 20% minimum sample. Proportional to size allocation technique was used to allocate the sample, and kebeles were divided into different clusters based on "Got" (small-villages) and number of participants in each cluster was calculated. Based on the allocated sample size, K clusters were selected from each kebele and total participants in each cluster were asked until we reached the adequate sample from each kebele.

2.5. Data Collection. Data was collected by using face-to-face interview technique using pretested and structured questionnaires, and it includes sociodemographic characteristics, household characteristics, reproductive characteristics, men's awareness of danger signs of obstetric complications at three stages, and questions related with birth preparedness practices.

After three days of extensive training on basic skills of interview, ways of obtaining verbal consent, and objective of the study, nine B.S. nurses conducted home to home visit for data collection also supervised by four public health professionals.

2.6. Data Quality Assurances. To maintain the quality of data, data collectors were trained. Pretest was done on 43 individuals (5% of the study participants) out of the study area with similar population in order to assess the validity of the instrument. Definition of concepts and terms was made so that they harmonize with a local language of the district to avoid ambiguity. Supervisors underwent on-site supervision during data collection period and reviewed all filled questionnaires before the next morning of each data collection, so as to identify incomplete and incoherent responses. Data was cleaned by performing frequencies for all variables to check for incorrectly coded data.

2.7. Definition of Terms

After childbirth: this is the period from expulsion of placenta to 6 weeks.

Danger signs of obstetric complications: these are signs and symptoms of obstetric complications which occur during pregnancy and childbirth and immediately after delivery and are measured by the total number of correct spontaneous answers to 15 items on knowledge of danger signs during pregnancy, labor, and childbirth.

Men involved in birth preparedness practice: they are the men involved at least in two BPP (a plan for skilled birth attendants, place of delivery, and arrangement of money for transport or other costs).

Pregnancy: it is the period from conception to onset of labor.

Vaginal bleeding: this is any vaginal bleeding irrespective of the amount during pregnancy and excessive vaginal bleeding or not the same as previous deliveries during labor and delivery.

Knowledgeable/had awareness: this is a man who knew danger signs of obstetric complications more than mean average score during any of the three phases (pregnancy, childbirth, or postpartum period).

Not knowledgeable/had no awareness: this is a man who knew danger signs of obstetric complications less than mean average score during the three phases.

2.8. Data Processing and Analysis. Each completed questionnaire was checked manually for completeness before data entry. The data was coded and entered into EPI Info version 7 and cleanup was made to check accuracy and consistency, and any error identified was corrected. Final data was exported to SPSS version 21 for further cleanup and analysis. Descriptive and summary statistics were carried out. Hosmer-Lemeshow goodness of fit test was used to check the assumption (P value = 0.71) of logistic regression model. Bivariable logistic regression analysis was used to identify the crude effect and variables that have P value of less than or equal to 0.2 were fitted to multiple logistic regression model to identify the presence and strength of association. Adjusted odds ratio with 95% CI was calculated to determine the presence and strength of association between the independent variables and men's awareness of danger signs. Hierarchical logistic regression model was fitted to know association between explanatory and outcome variables. Crude odds ratio and adjusted odds ratio with 95% CI were used to determine the presence and strength of association between men's awareness of danger signs and men's involvement in birth preparedness practices.

3. Results

3.1. Sociodemographic and Economic Characteristics. Total numbers of husbands/partners interviewed were 836 (98.9%). Among them, two hundred thirty-five (28.1%) of them had

completed primary education, the majority of them were married (97.8%), almost all (97.8%) of them were Gamo by ethnicity, and five hundred eight (60.8%) were orthodox by religion. Regarding economic status, 20.3% (170) were found in the second wealth quintile and median and range of age of husbands were 35 and 48, respectively. The majorities (74.2%) of the wives were housewives by occupation and had not received any education (54.1%) (Table 1).

3.2. Reproductive Characteristics. The mean time taken to reach health facility for delivery services was 40.5 ± 34.9 min. More than three-fourths (93.1%) of the study households have two or more children. More than half (60.6%) of the households use local transportation/Kareza to take pregnant women in labor to health facility and almost all (96.3%) of the husbands knew where to go if labor occurs to their wives. Wives of four hundred ninety-seven (59.6%) husbands gave birth at home and 41.6% delivered at different public health facilities such as public hospitals (16.5%), public health centers (16.4%), and health posts (7.7%) in the past three years.

3.3. Men's Awareness of Obstetric Danger Signs during Pregnancy and Labor and after Childbirth. Three hundred thirty-six (42.2%), 95% CI (39%, 46%), men knew danger signs of obstetric complications which was measured by mean score at three stages (Figure 1).

The percentage of men who knew vaginal bleeding related to pregnancy was (34%), in relation to delivery (60.4%) and in relation to postpartum period (32.2%). Severe abdominal pain (87%) was the most recognized danger sign and water breaking/leaking before labor (1.2%) was the least mentioned danger sign during pregnancy. Severe vaginal bleeding was the most recognized danger sign during labor and childbirth and after delivery by 32.2% and 60.4%, respectively. Loss of consciousness was the least recognized danger sign during labor (13%) and after childbirth (2.8%).

Prolonged labor was known only by 21.4% of the husbands, while retained placenta was recognized by 19.7%.

3.4. Bivariable Logistic Regression Analysis

3.4.1. Sociodemographic and Economic Characteristics. Except marital status and religion, all other sociodemographic and economic characteristics were significantly associated with men's awareness of danger signs of obstetric complications on bivariable logistic regression analysis.

3.4.2. Association between Reproductive Characteristics and Men's Awareness of Obstetric Danger Signs. Good knowledge about place of delivery, time taken to reach health facility, and place of delivery such as public hospital, public health center, and health post were significant factors of men's awareness of danger signs of obstetric complications, but all other reproductive characteristics were not significant.

3.5. Multiple Logistic Regression Analysis. The independent variables, residence, paternal and maternal occupation,

TABLE 1: Sociodemographic and socioeconomic characteristics of household, husband, and wives at Chencha district, southern Ethiopia, 2014.

Variables	Frequency	%
<i>Household characteristics</i>		
<i>Residence (place of living)</i>		
Rural	610	73
Urban	226	27
<i>Marital status</i>		
Married	818	97.8
Widowed	7	0.8
Separated	11	1.3
<i>Religion</i>		
Protestant	326	39.0
Orthodox	508	60.8
Catholic	2	0.2
<i>Wealth index quintile (economic status)</i>		
Lowest	167	20.1
Second	170	20.3
Middle	164	19.6
Fourth	167	20.0
Highest	168	20.0
<i>Involvements status in HDA (health development army)</i>		
Leader	284	34.0
Member	351	42.0
Neither of the two	201	24.0
<i>Husband/partner characteristics</i>		
<i>Age of husband</i>		
≤19	5	0.6
20–29	192	22.9
30–39	370	44.2
40–49	231	27.6
50–59	39	4.7
<i>Educational status of husbands</i>		
No education	330	39.5
Primary education	235	28.1
Secondary education	151	18.1
Above secondary education	120	14.4
<i>Occupational status of husband</i>		
Farmer	355	42.5
Weaver	229	27.4
Merchant	64	7.7
Government employee	108	12.9
Private gainful work	49	5.9
Others (no specified job)	31	3.7

wealth index, participation in the health development army, number of children, and place of delivery were factors

FIGURE 1: Men's awareness of danger signs of obstetric complications at Chencha district, southern Ethiopia, 2014.

associated with men awareness of danger signs of obstetric complications.

Accordingly, husbands who live in the rural area were 8.4 times [(AOR: 8.41; (95% CI: (4.99, 14.2))] more knowledgeable than urban husbands. Compared to wives whose occupation was housewife, women whose occupation was weaver had 6 times [(AOR: 5.94; (95% CI: (1.07, 33.0))] higher odd of being aware of danger sign. Husbands whose occupation is weaver also and government employee were 2 times [(AOR: 1.95; (95% CI: (1.24, 3.06))] and 4 times [(AOR: 3.75; (95% CI: (1.38, 10.2))] more knowledgeable than their farmer counterparts, respectively. Economic status was also significantly associated with men's awareness of danger signs of obstetric complications. Husbands in the highest wealth quintile (wealthiest) were 3 times [(AOR: 3.09; (95% CI: (1.51, 6.34))] more knowledgeable compared to the lowest wealth index quintile (poorest). Final household factor which has association with men's awareness of danger signs of obstetric complications was role in the health development army; thus husbands who did not involve themselves in the health development army were by 57% less [(AOR: 0.43; (95% CI: (0.26, 0.72))] knowledgeable than leaders of health development army.

Husbands whose wives gave birth in the hospital [(AOR: 2.09; (95% CI: (1.29, 3.37))], health center [(AOR: 1.99; (95% CI: (1.21, 3.28))], and health post [(AOR: 2.16; (95% CI: (1.06, 4.04))] were 2 times more aware than husbands whose wives gave birth at home.

Finally, households with one child were by 50% [(AOR: 0.50; (95% CI: (0.27, 0.93))] less aware of the danger signs than those who had two or more alive children (Table 2).

3.6. Male Involvements in Birth Preparedness Practices. The prevalence of men's involvements in birth preparedness practice was 9.4% (95% CI: 7.42, 11.4) (Figure 2).

TABLE 2: Factors associated with men's awareness of danger signs of obstetric complications at Chencha district of southern Ethiopia, 2014.

Variables	Male awareness <i>N</i> (%)		COR (95% CI)	AOR (95% CI)
	Yes	No		
<i>Household characteristics</i>				
Residences				
Rural	296 (48.5)	314 (51.5)	4.38 (3.01, 6.39)	8.41 (4.99, 14.2)**
Urban	40 (17.7)	186 (82.3)	1	1
Wealth index quintile				
Lowest	106 (63.1)	62 (36.9)	1	1
Second	80 (47.1)	90 (52.9)	4.23 (2.56, 6.98)	1.83 (0.94, 3.57)
Middle	67 (40.9)	97 (59.1)	3.29 (1.98, 5.46)	1.53 (0.82, 2.86)
Fourth	54 (32.3)	113 (67.7)	2.27 (1.36, 3.81)	1.23 (0.67, 2.25)
Highest	29 (17.4)	138 (82.6)	8.14 (4.89, 13.5)	3.09 (1.51, 6.34)**
Role in health development army				
Leader	90 (31.7)	194 (68.3)	1	1
Member	151 (43.0)	200 (57.0)	1.63 (1.17, 2.26)	0.80 (0.52, 1.24)
Neither of the two	95 (47.7)	106 (53.3)	1.93 (1.33, 2.81)	0.43 (0.26, 0.72)
<i>Husband characteristics</i>				
Age of husband				
≤19	2 (40.0)	3 (60.0)	1.69 (0.25, 11.6)	—
20–29	67 (35.1)	124 (64.9)	1.38 (0.64, 2.94)	
30–39	176 (47.6)	194 (52.4)	2.31 (1.12, 4.78)	
40–49	80 (34.6)	151 (65.4)	1.35(0.64–2.85)	
50–59	11 (28.2)	28 (71.8)	1	
<i>Partner/wife characteristics</i>				
Occupation status of wife				
Housewife	236 (38.0)	385 (62.0)	1	1
Farmer	13 (18.8)	56 (81.2)	0.38 (0.23, 0.71)	0.52 (0.24, 1.15)
Weaver	8 (80.0)	2 (20.0)	6.53 (1.37, 30.9)	5.94 (1.07, 33.0)*
Government employee	34 (66.7)	17 (33.3)	3.26 (1.78, 5.97)	1.11 (0.51, 2.43)
Others (private work)	45 (52.9)	40 (47.1)	1.85 (1.16, 2.89)	0.77 (0.41, 1.42)
<i>Reproductive characteristics</i>				
Number of alive children in the family				
≤1	29 (50.0)	29 (50.0)	1.54 (0.89, 2.62)	0.50 (0.27, 0.93)*
2 or more	307 (39.5)	471 (60.5)	1	1
Place of delivery				
Home	171 (34.4)	326 (65.6)	1	1
Public hospital	83 (60.1)	55 (39.9)	2.88 (1.95, 4.24)	2.09 (1.29, 3.37)*
Public health center	57 (41.6)	80 (58.4)	1.39 (0.92, 2.00)	1.99 (1.21, 3.28)*
Health post	25 (39.1)	39 (60.9)	1.22 (0.72, 2.09)	2.16 (1.06, 404)*

Note: P value: * <0.05; ** <0.001.

3.7. Effect of Men's Awareness of Danger Signs of Obstetric Complications on Involvement in Birth Preparedness Practice. The results showed a clear association of men's awareness of danger signs of obstetric complications with male involvement in birth preparedness practice in the district. The effect remained statistically significant even after controlling for possible confounding of residence, wealth index, educational status, and occupational status of women. Thus husbands who had awareness of danger signs of obstetric complications were two times [(AOR: 1.91; (95% CI: (1.06, 3.41))] more likely involved in birth preparedness practice than respondents

who had no awareness of danger signs of obstetric complications (Table 3).

4. Discussion

Although researches have not previously assessed men's awareness of danger signs of obstetric complications and associated factors in Ethiopia, this study assumes that men potentially would have an equal understanding compared to women and based on this assumption, it utilized the study done in women to compare the findings. On top of this, we

TABLE 3: Association (odds ratio, 95% CI) between men's awareness of danger signs of obstetric complications and birth preparedness: hierarchical logistic regression analysis.

Male involvements in birth preparedness practice	Crude odds ratio	Model 1 (adjusted for residence)	Model 2 (adjusted for residence and wealth index)	Model 3 (adjusted for residence, wealth index, education, and occupational status)
Men's awareness				
Has awareness	1.79 (1.12, 2.8)	2.58 (1.54, 4.30)	2.26 (1.30, 3.92)	1.91 (1.07, 3.41)*
Has no awareness	1	1	1	1
Residences	—			
Rural		0.31 (0.19, 0.54)	0.31 (0.18, 0.54)	0.27 (0.15, 0.49)**
Urban		1	1	1
Wealth index quintile	—	—		
Lowest			0.12 (0.02, 0.99)	0.19 (0.23, 1.64)
Second			3.37 (1.55, 7.32)	4.38 (1.93, 9.92)**
Middle			5.29 (2.44, 11.5)	7.04 (3.01, 16.5)**
Fourth			0.86 (0.29, 2.49)	1.21 (0.39, 3.77)
Highest			1	1
Paternal education	—	—	—	
No education				0.77 (0.28, 2.13)
Primary education				1.71 (0.68, 4.28)
Secondary education				4.61 (1.91, 11.1)**
Above secondary education				1
Maternal occupation	—	—	—	
Housewife				1
Farmer				0.23 (0.061, 0.88)
Weaver				1.06 (0.10, 10.3)
Government employee				0.54 (0.14, 2.02)
Others (merchant)				0.79 (0.35, 1.78)

Note: P value: * <0.05; ** <0.001.

FIGURE 2: Prevalence of male involvement in birth preparedness practices at Chench district, southern Ethiopia, 2014.

used the study done among men in sub-Saharan Africa and other parts of the world.

The finding of this study revealed that the prevalence of men's awareness of danger signs of obstetric complications was 42.2% (95% CI (39%, 46%)) which was assessed by mean score and this was lower than findings in the study done among men in rural area of Kenya and women in Tanzania [18, 19] and lower than the study conducted in Egypt, Alexandria, and the study done in Uganda among women [20, 21]. The lower awareness could be explained by poor counseling of danger signs among men and less involvement in health development army in urban area, since the majority of the study subjects in urban area lack good awareness. The higher awareness in rural area might be due to the Ethiopian government's emphasis on health extension program that made the majority of men aware of danger signs of obstetric complications [13, 22].

Residences, wealth index, number of children/parity, occupational status, role in health development army, and place of delivery were significantly associated with men's awareness of danger signs of obstetric complications.

Being a rural resident increased men's awareness of danger signs of obstetric complications; this was contradictory with the study done in Aleta-Wondo district of southern Ethiopia among women, where urban residents were more knowledgeable than rural ones [23]. The finding surprises investigators but this might be explained by standard health education offered by rural health extension worker and more involvement of rural men in maternal and child health packages in rural area by enrolling them in the health development army.

Economic statuses of households were significantly associated with men's awareness of danger signs. This was shown in the study done in Uganda [21], but the study done in Tigray region of Ethiopia [24] and Tanzania [19] showed that economic status was not associated with knowledge on danger signs of obstetric complications. This might be due to the fact that men with the highest economic status buy radio and other media to get more information about maternal health. In addition men with the highest economic status seek delivery service from health facility and are exposed to health education that is given in the health institution.

Moreover, wives occupation seems to influence the level of men's awareness about danger signs of obstetric complications. This could be explained by the fact that working women have better opportunity to share experiences with others and transfer those to husbands than housewives [20].

Place of delivery was significantly associated with men's awareness of danger signs of obstetric complications. Husbands whose wives gave birth in the health institutions (health center, hospital, and health post) were more knowledgeable than husbands whose wives gave birth at home. This is consistent with the study done in Tanzania [19], in which wives/partners who gave birth in the health institution have had more knowledge when compared with wives who gave birth at home. This may be explained by standard health education offered by healthcare professionals and health extension workers to women and they also transfer information to their husbands at home; in addition health extension workers in rural side involve more men during ANC forum and disseminate maternal and child health related packages which initiate men's involvement in the delivery services from health institution, which in turn open the way to get information from health facility [25].

Parity which was measured by number of children in this study was a significant factor associated with men's awareness. The finding was consistent with the study done in Egypt and Tanzania [19, 20]. This might be due to high antenatal coverage and relatively high frequency of visits among women of high parity which provides an excellent opportunity for information, education, and communication, and they in turn transfer it to their husbands [19, 26].

Husbands who did participate in health development army (HDA) had more awareness of danger signs, compared to husbands who did not participate in HDA; this might be due to the fact that the former ones are exposed to health education which is provided in different meeting with health professional and health extension worker; in addition, health development army members gather together

and discuss the reproductive issue with each other and health professionals, which in turn increases their awareness [25]. Finally educational status has no significant association with that of men's awareness; this might be due to masking of the effect of education due to rural health extension program achievements.

The magnitude of men's involvement in birth preparedness practices of 9.4% estimated in our study appears to be higher than what was reported from Kenya (7%) [27] but lower than ((20%–22%), 44.3%, and 48%) studies done in Ethiopia, Uganda, and India, respectively [28–31]. Low level of involvement in birth preparedness might be due to low level of economic status, in the district, which in turn hampers husbands' involvement in the birth preparedness practices, particularly involving themselves in saving money. In addition this study showed that males give due emphasis to food and cloth preparation for upcoming baby and mother than preparing for transportation and saving money; this might also be due to one-way ambulance service that has been provided freely for the laboring mother and delivery services in the health center [25].

The study also showed significant association between men's awareness of danger signs of obstetric complications and involvement in birth preparedness practice. Accordingly husbands who were aware of danger signs of obstetric complications were two times more likely involved in birth preparedness practice than husbands who had no awareness of danger signs. This was evidenced by the study done in Uganda in which women's awareness of danger signs predicts the level of birth preparedness practices [32]. This might be due to the assumption that knowledge of danger signs leads to greater anticipation and preparation to mitigate effects of pregnancy and childbirth complications by reducing the first two delays and the third delay if health facilities are prepared to address obstetric complications.

Furthermore educational status, economic status which was measured by wealth index quintile, and place of residence had significant effect on male involvements in birth preparedness practices, but occupational status has no significant effect on male involvement in birth preparedness practices.

Limitation and Strength of the Study. It is difficult, however, to compare our study findings with those from others as the measures used to determine birth preparedness had some variations and there are also differences in sex. Nevertheless, the underlying principles regarding birth preparedness are the same and the methods used to study birth preparedness were the same. It is possible that there may have been different degrees of recall bias between men who did have wife who gave birth before two years and within two years. This may introduce misclassification bias, resulting in positive/negative association. Confounding was controlled in the analysis by stepwise hierarchical logistic regression model. Possible confounders were introduced into the level and they did not have significant effect on the association between men's awareness of danger signs and involvement in birth preparedness practices.

5. Conclusion

Our study showed low levels of awareness of obstetric danger signs among men in Chench district of southern Ethiopia. Since men are acting as gatekeepers to women's health, it is of paramount importance if they are able to recognize the danger signs of obstetric complications which in turn decrease one of the three delays. Residences, wealth index, number of children, occupational status, role in health development army, and place of delivery were important factors associated with men's awareness of danger signs. So the government and stakeholders should start innovative maternal health intervention to encourage institutional delivery and to discourage home delivery, and the Ministry of Health needs to review urban health extension program, to review the focus and include men in health education regarding danger signs of obstetric complications. The government and stakeholders should emphasize boosting household economic status and providing work opportunity that brings income for respondents. Health extension program especially urban HEP should focus on men health education to boost men's awareness of danger signs through involving them in the health development army.

Our study showed very low involvement in birth preparedness practice among men in Chench district. The study also demonstrated strong association between men's awareness of dangers signs of obstetric complications and men's involvements in birth preparedness. It is of paramount importance if husbands are able to recognize the danger signs of obstetric complications which are an indication that urgent emergency care needs to be sought from skilled attendants and which in turn increase their involvement in birth preparedness practice.

Ethical Approval

Ethical clearance for the study was obtained from the Institutional Ethical Review Board (IRB) of the College of Medicine and Health Sciences, Arba Minch University, and a permission letter was taken from Chench district health offices.

Consent

Informed oral consent was taken from individual participants. No form of identifiers was included in the questionnaires to maintain confidentiality. Participation was voluntary and participants were informed that they could withdraw from the study at any stage if they wanted, without any penalty.

Conflict of Interests

The authors declare that there is no conflict of interests.

Authors' Contribution

Alemu Tamiso Debiso was the primary researcher, envisioned the study, designed, participated in supervision and

quality assurances, conducted data analysis, and drafted and finalized the paper for publication. Behailu Merdekios Gello and Marelign Tilahun Malaju assisted in data collection and reviewed the initial and final drafts of the paper. Behailu Merdekios Gello and Marelign Tilahun Malaju read and approved the final paper.

Acknowledgments

The authors are very grateful to Chench district health office, for its administrative and technical assistance. Arba Minch University deserves special acknowledgement for funding opportunity and data collectors and supervisors are acknowledged for their support in data collection and supervision.

References

- [1] G. J. Hofmeyr, R. A. Haws, S. Bergström et al., "Obstetric care in low-resource settings: what, who, and how to overcome challenges to scale up?" *International Journal of Gynecology & Obstetrics*, vol. 107, supplement 1, pp. S21–S45, 2009.
- [2] Central Statistical Agency [Ethiopia] and ICF International, *Ethiopia Demographic and Health Survey 2011*, ICF International, Calverton, Md, USA; Central Statistical Agency, Addis Ababa, Ethiopia, 2012.
- [3] N. Gupta, "Maternal Mortality: magnitude causes and concerns," *Journal of Obstetrics and Gynaecology*, vol. 9, pp. 555–558, 2004.
- [4] O. M. Campbell and W. J. Graham, "Strategies for reducing maternal mortality: getting on with what works," *The Lancet*, vol. 368, no. 9543, pp. 1284–1299, 2006.
- [5] M. Drennan, *Reproductive Health: New Perspectives on Men's Participation*, vol. 46 of *Population Reports Series J*, Johns Hopkins University, Population Information Programme, Baltimore, Md, USA, 1998.
- [6] R. C. Del Barco, *Monitoring Birth Preparedness and Complication Readiness. Tools and Indicators for Maternal and Newborn Health*, JHPIEGO, Baltimore, Md, USA, 2004.
- [7] S. Babalola and A. Fatusi, "Determinants of use of maternal health services in Nigeria—looking beyond individual and household factors," *BMC Pregnancy and Childbirth*, vol. 9, article 43, 2009.
- [8] Y. Berhan and A. Berhan, "Causes of maternal mortality in Ethiopia: a significant decline in abortion related death," *Ethiopian Journal of Health Sciences*, vol. 24, pp. 15–28, 2014.
- [9] A. Abdella, "Maternal mortality trend in Ethiopia," *Ethiopian Journal of Health Development*, vol. 24, no. 1, pp. 115–122, 2010.
- [10] A. Sebhatu, "The implementation of Ethiopia's Health Extension Program: an overview," 2012.
- [11] A. Starrs, *The Safe Motherhood Action Agenda: Priorities for the Next Decade. Report on the Safe Motherhood Technical Consultation 18–23 October 1997 Colombo Sri Lanka*, Family Care International, New York, NY, USA, 1997.
- [12] E. B. Keyes, A. Haile-Mariam, N. T. Belayneh et al., "Ethiopia's assessment of emergency obstetric and newborn care: setting the gold standard for national facility-based assessments," *International Journal of Gynecology & Obstetrics*, vol. 115, no. 1, pp. 94–100, 2011.

- [13] J. Wilder, *Ethiopia's Health Extension Program: Pathfinder International's Support 2003–2007*, Pathfinder International, Watertown, Mass, USA, 2008.
- [14] B. Alemu and M. Asnake, *Women's Empowerment in Ethiopia: New Solutions to Ancient Problems*, Pathfinder International, 2007.
- [15] A. Starrs, *The Safe Motherhood Action Agenda: Priorities for the Next Decade. Report on the Safe Motherhood Technical Consultation, 18–23 October 1997, Colombo, Sri Lanka*, Family Care International, New York, NY, USA, 1998.
- [16] B. Evjen-Olsen, S. G. Hinderaker, R. T. Lie, P. Bergsjø, P. Gasheka, and G. Kvåle, "Risk factors for maternal death in the highlands of rural northern Tanzania: a case-control study," *BMC Public Health*, vol. 8, no. 1, article 52, 2008.
- [17] M. N. Wegner, J. Ruminjo, E. Sinclair, L. Pessoa, and M. Mehta, "Improving community knowledge of obstetric fistula prevention and treatment," *International Journal of Gynecology and Obstetrics*, vol. 99, supplement 1, pp. S108–S111, 2007.
- [18] A. Dunn, S. Haque, and M. Innes, "Rural Kenyan Men's awareness of danger signs of obstetric complications," *Pan African Medical Journal*, vol. 10, no. 39, 2011.
- [19] A. B. Pembe, D. P. Urassa, A. Carlstedt, G. Lindmark, L. Nyström, and E. Darj, "Rural Tanzanian women's awareness of danger signs of obstetric complications," *BMC Pregnancy and Childbirth*, vol. 9, no. 1, article 12, 2009.
- [20] W. A. Rashad and R. M. Essa, "Women's awareness of danger signs of obstetrics complications," *Journal of American Science*, vol. 6, no. 10, pp. 1299–1306, 2010.
- [21] J. K. Kabakyenga, P.-O. Östergren, E. Turyakira, and K. O. Pettersson, "Knowledge of obstetric danger signs and birth preparedness practices among women in rural Uganda," *Reproductive Health*, vol. 8, no. 1, article 33, 2011.
- [22] A. Medhanyie, M. Spigt, Y. Kifle et al., "The role of health extension workers in improving utilization of maternal health services in rural areas in Ethiopia: a cross sectional study," *BMC Health Services Research*, vol. 12, no. 1, article 352, 2012.
- [23] M. Hailu, A. Gebremariam, and F. Alemseged, "Knowledge about obstetric danger signs among pregnant women in Aleta Wondo district, Sidama Zone, Southern Ethiopia," *Ethiopian Journal of Health Sciences*, vol. 20, no. 1, 2011.
- [24] D. Hailu and H. Berhe, "Knowledge about obstetric danger signs and associated factors among mothers in Tsegedie district, Tigray region, Ethiopia 2013: community based cross-sectional study," *PLoS ONE*, vol. 9, no. 2, Article ID e83459, 2014.
- [25] FMOH, "Ethiopia five year Health Sector Development Program IV (2010/11–2014/15)," in *Maternal Health Services*, Federal Ministry of Health, Addis Ababa, Ethiopia, 2010.
- [26] N. Regassa, "Antenatal and postnatal care service utilization in southern Ethiopia: a population-based study," *African Health Sciences*, vol. 11, no. 3, pp. 390–397, 2011.
- [27] S. M. Mutiso, Z. Qureshi, and J. Kinuthia, "Birth preparedness among antenatal clients," *East African Medical Journal*, vol. 85, no. 6, pp. 275–283, 2008.
- [28] M. Hailu, A. Gebremariam, F. Alemseged, and K. Deribe, "Birth preparedness and complication readiness among pregnant women in Southern Ethiopia," *PLoS ONE*, vol. 6, no. 6, Article ID e21432, 2011.
- [29] M. Hiluf and M. Fantahun, "Birth preparedness and complication readiness among women in Adigrat town, north Ethiopia," *Ethiopian Journal of Health Development*, vol. 22, no. 1, pp. 14–20, 2008.
- [30] S. Agarwal, V. Sethi, K. Srivastava, P. K. Jha, and A. H. Baqui, "Birth preparedness and complication readiness among slum women in Indore city, India," *Journal of Health, Population and Nutrition*, vol. 28, no. 4, pp. 383–391, 2010.
- [31] O. Kakaire, D. K. Kaye, and M. O. Osinde, "Male involvement in birth preparedness and complication readiness for emergency obstetric referrals in rural Uganda," *Reproductive Health*, vol. 8, article 12, 7 pages, 2011.
- [32] S. N. Mbalinda, A. Nakimuli, O. Kakaire, M. O. Osinde, N. Kakande, and D. K. Kaye, "Does knowledge of danger signs of pregnancy predict birth preparedness? A critique of the evidence from women admitted with pregnancy complications," *Health Research Policy and Systems*, vol. 12, no. 1, article 60, 2014.