

# Male Involvement in Birth Plan and Complication Readiness Jima Arjo Town, East Wollega, Western Ethiopia: Community based Cross-Sectional Study

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## Abstract

**Background:** Birth plan and complication readiness is the strategy to promote the timely use of skilled maternal and neonatal care, especially during child birth which make the family or partner ready and reduces delays in obtaining care.

**Objective:** The aim of this study was to assess male involvement in Birth Preparedness and Complication Readiness (BP/CR) and associated factors among married male partner in Jima Arjo town, east Wollega, West Ethiopia.

**Methods:** Community based cross sectional study design was conducted from March 10-12 GC in Jima Arjo town. Both kebeles in Jima Arjo town were selected; census was conducted to identify household having less than one year old child and systematic sampling method was used to select 203 study participants. Collected data was cleaned and entered in to SPSS (Statistical Package for Social Sciences) version 20 for analysis. Descriptive statistics and logistic regression was done to identify factors associated with substance use in the study area.

**Results:** The overall birth preparedness and complication readiness practice among married male in Jima Arjo Town was 132 (68.4%). Majority of male partners had good knowledge 115 (59.6%). Husbands who can't read and write (AOR=0.056, 95% CI=0.04-0.761); Partners involved in domestic household activities (AOR=3.27, 95% CI=1.346-7.918) and husbands who had poor knowledge (AOR=0.212, 95% CI=0.05-0.875) were associated with male involvement in birth preparedness and complication readiness.

**Conclusion:** Male involvement in birth preparedness and complication readiness in this study area was relatively high. Knowledge of danger signs, education of husbands, involved in domestic household activity was found to affect male involvement in birth preparedness and complication readiness. Therefore action should be taken increase male involvement in BP/CR further through increasing awareness of the partner, family and community towards danger signs of pregnancy, labor, postpartum period and neonates which could avert delays at all levels.

**Keywords:** Birth preparedness; Complication readiness; Child birth; Danger signs

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## Introduction

Worldwide, around two hundred eighty-nine thousand maternal mortality occurs each year from complications related to pregnancy and childbirth of which 99% has occurred in resource

limited countries. Sub-Saharan Africa had taken the highest Maternal Mortality Rate (MMR) [1]. Leading cause of maternal mortality in Ethiopia is hemorrhage and pregnancy induced hypertension [2,3].

Birth plan and complication readiness is the strategy to promote

the timely use of skilled maternal and neonatal care, especially during child birth which make the family or partner ready and reduces delays in obtaining care [4]. Male partner/husband involvement is crucial for the existence, maintenance and care of pregnancy, and the newborn at large. Male involvement in pregnancy and childbirth reduces negative maternal health behaviors, risk of preterm birth, low birth weight, fetal growth restriction, and infant mortality as well. It also reduces maternal stress (emotional, logistical and financial support), increases uptake of prenatal care, leads to cessation of risk behaviors and ensures men's involvement in their future parental roles from an early stage [5]. Also encourages women, households and community to make arrangements such as identifying or establishing available transport, setting aside money to pay for service fees and transport, identify blood donor, also reduce delay in receiving appropriate care [6]. Because women accompanied by their husbands are more likely to attend Ante Natal Care visit (ANC) trained provider, give birth at health facility and attend post natal care [7]. Despite this maternal mortality and neonatal mortality is relatively high compared to the national target particularly of this study area, which could have been averted through effective practice of male involvement in birth plan and complication readiness. Therefore the aim of this study was to study magnitude of male involvement in birth plan and complication readiness and associated factors.

## Materials and Methods

### Study setting and period

This study was conducted from March 10-12 GC in Jima Arjo town, located at 50 km from Nekemte the capital of east Wollega zone and 382 km from Addis Ababa to the west of the country.

Jima Arjo Town is small woreda town owing 3,268 households, 3,268 reproductive age women and 450 households with under one year old. This small town has one public health center only and other private clinic and pharmacy.

**Study design:** Community-based cross-sectional survey was conducted to assess male involvement in birth plan and complication readiness and associated factors among married men with their wife having less than one year old child in Jima Arjo town.

**Source population:** The source populations of the study were all married men in the households with less than one year old in the Jima Arjo town during the study period.

**Study subject:** The study subject in this study was a sampled married man in the households with less than one year old child during the study period.

**Sample size determination:** To estimate the sample size, a single population proportion formula with the following assumptions was used.

#### Assumptions:

Desired precision (d)=5%

Proportion of Husbands' participation on the birth preparedness and complication readiness in Enderta Woreda, Tigray region, Ethiopia, 60.4 [8]. Confidence level=95%, which means  $\alpha$  set at 0.05 and  $Z_{\alpha/2}=1.96$  (value of Z at  $\alpha$  0.05 or critical value for normal distribution at 95% CI.

$$N_0 = \frac{(Z_{\alpha/2})^2 P (1 - P)}{d^2} = 367$$

$$d^2$$

But the total number of target population in the study area was less than 10,000 so that correction formula was employed as follows:

$$n = \frac{(Z_{\alpha/2})^2 P (1 - P)}{d^2}$$

$$d^2$$

Where 'no' is initial sample; 'N' is total number of target population in the study area and 'n' is final calculated sample size.

### Sampling procedures

Jima Arjo was selected randomly and the town has 2 kebeles where both of them were selected. Then, census was conducted to identify households or couples having children aged less than one year. Sample was allocated proportionally for both kebeles based on the number of household with children aged less than one year. Using the result of census, sampling frame was prepared; sampling fraction was calculated and initial household with eligible respondent was picked randomly. Finally, study samples were selected using a systematic sampling method. One more visit was attempted in the absence of married men in the sampled household.

### Inclusion and exclusion criteria

Married men aged greater than 18 years old, who have lived in the town for more than one year were included. A seriously ill and married man with mental disorder was excluded.

### Data collection and questionnaire

A structured interviewer-administered questionnaire was used. The questionnaire was adopted from similar studies done in Tigray Enderta and Ambo town [9]. It was modified based on the situation of the study to collect information on male involvement in birth plan and complication readiness and associated factors in Jima Arjo town. The questionnaire was prepared in English, translated to Afaan Oromoo and translated back to English by another person in order to check its consistency. The questionnaire has four sections: Socio- demography, knowledge of men about birth plan and complication readiness, male involvement in birth plan and complication readiness and Men knowledge of obstetric danger sign during pregnancy, labor and postpartum. The questionnaire was pretested before actual data collection among 10 respondents (5% of the calculated sample size) in Getema town. Because population residing in Getema

town share almost similar characteristics with the population in the study area.

Four health extension workers were trained for data collection on the content of the questionnaire and approach to participants during data collection. They were selected based on their ability to speak and write Afaan Oromoo language. During data collection, one supervisor was selected to supervise the data collector's activity, checking the completeness of the questionnaire and receive the collected and completed questionnaire. Participants were interviewed, where they were free to express their idea freely.

### Data processing and analysis

Data were coded, entered into SPSS version 20.0 for analysis. Descriptive statistics were computed to determine the frequency and percentages. Binary logistic regression was conducted and COR, with 95% CI was estimated to select the candidate variables for the final model. Then, variables with a p-value of <0.2 at binary logistic regression were taken into a multivariable logistic regression. Hosmer-Lemeshow goodness-of-fit with stepwise logistic regression was used to test for model fitness. AOR with 95% CI was estimated to assess the presence of association at multivariable logistic regression. Finally, variables with a p-value of <0.05 were considered as statistically significant and associated factors with outcome variable.

### Operational definition

Male involvement in birth plan and complication readiness: Husbands found to participate in more than five components of BP/CR parameters are considered as involved in BP/CR.

Knowledge of danger signs of pregnancy, labor, postpartum and neonates: Knowledge husband for danger signs of pregnancy, labor, postpartum and neonates. Twenty item knowledge questions were considered to level the knowledge status of respondents about danger signs. Male partners answered less than 60% of the knowledge question was graded as poor knowledge, those answered 60%-79% of the questions were good knowledge and above 80% of the question were graded as better knowledge [10].

**Kebele:** The smallest administrative unit in Ethiopia with a geographical boundary of having a minimum of 1000 households.

### Data quality management

To assure the quality of the data, structured interviewer-administered questionnaire was used to collect information. Before the actual data collection, pre-test had been conducted. During data collection, data collectors were trained for one day and they have been informed about how to approach the respondents, how to apply the designed data collection method, how to ask each of the questions, follow the instructions of the questionnaire and to keep the confidentiality of the respondents. One supervisor was assigned to check the completeness of the questionnaire every night with the principal investigator.

## Results

### Socio-demographic characteristics of the respondents

One hundred ninety three (193) husbands who had less than one year child was interviewed in Jima Arjo town making response rate of 95%. The mean age of study participant was 33+5.1, range from 22-45 years old. Majority 153 (79.3%) of participant live in urban. Most of the study participant 121 (62.7%) were orthodox and followed by protestant and Muslim, 57 (29.5%) and 14 (7.3%) respectively in religion (**Table 1**).

### Awareness of respondents about birth plan preparedness and complication readiness

In this study about 169 (87.6%) had ever heard birth preparedness and complication readiness, of which the major source of information was; Health Extension Workers (HEW) 94 (48.7%), health professions 52 (26.9%), Radio/television 17 (8.8%), and internet and other social media 6 (3.1%). The study revealed the recent place of delivery was health center 147 (76.2%), hospital 42 (21.8%), and at home 4 (2.1%) in the study area. More than half 161 (83.4%) were assisted by midwives, while 32 (16.5%) assisted by medical doctor.

### Male involvement in Antenatal Care (ANC) among respondents in Jima Arjo town

The magnitude of male involved in Antenatal care in Jima Arjo town was 81.3%. This study identified that roles of male/husband during Antenatal care were: 144 (74.6) were accompanying their partners for ANC, taking care for domestic chores 18 (9.3%) and looking after the children at home 8 (4.1%). About 157 (81.3%) respondents help their wife in domestic household tasks during recent pregnancy. Most of the decision making to seek health care were made together by discussion 176 (91.2%) followed by: Her/his parents 7 (3.6%), male/husband 5 (2.6%), and wife 5 (2.6%) (**Table 2**).

### Knowledge of male partner about obstetric danger sign during pregnancy, labor and postpartum

Vaginal bleeding as danger sign during pregnancy were mentioned by 172 (31.7%), during postpartum period were 120 (22.5%). Vaginal bleeding was the most recognized danger sign and seizure or convulsion 1 (2%) was the least mentioned danger sign during pregnancy. Malodor vaginal discharges 2 (4%) were the least recognized danger signs during postpartum. Prolonged labor was mentioned by 112 (38.4%) of men, while premature rupture of membrane was by 42 (14.4%) and retained placenta was the least recognized danger signs during pregnancy mentioned by 3 (1%) of men. About 77 (20.5) mentioned umbilical bleeding while 65 (17.3%) knew poor sucking/feeding (**Table 3**). The knowledge level of respondent about had of danger signs during pregnancy, labor, delivery, postpartum and neonates is, good knowledge 115 (59.6%), poor knowledge 51 (26.4%) and better knowledge 17 (14%) (**Figure 1**).

**Table 1:** Socio-demographic characteristics of husbands who had less than one year child in Jima Arjo Town, Oromia regional state, West Ethiopia 2018 G.C.

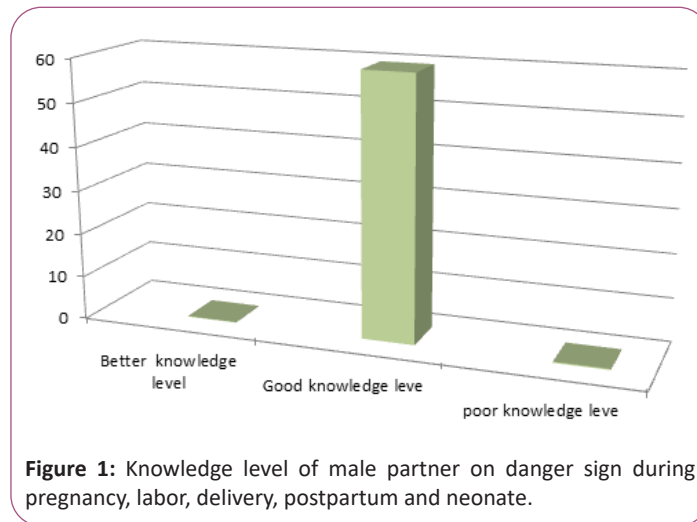
S.N	Variables	Categories	Frequency(n)	Percentage (%)
1	Age (N=193)	20-24 years	5	2.6
		24-29	49	25.4
		30-34	66	34.2
		35-39	49	25.4
		40-44	21	10.9
		>45	3	1.6
2	Educational status of husband (n=193)	Can't read and write	2	1
		Read and write	32	16.6
		Primary school (1-8)	28	14.5
		High school and preparatory school (9-12)	70	36.3
		College and above	61	31.6
3	Occupational status of husband (n=193)	Employer	58	30.1
		Merchant	78	40.4
		Private	36	18.7
		Farmer	19	9.8
		Others	2	1
4	Age at first marriage (n=193)	≤ 18 years	84	43.5
		19-29 years	63	32.6
		30-39 years	41	21.2
		>40	5	2.6
5	Occupational status of wife (n=193)	Can't read and write	4	2.1
		Read and write	45	23.3
		Primary school	53	27.5
		High school and preparatory school	67	34.7
		College and above	24	12.4
6	Occupation of wife (n=193)	Employer	27	14
		Merchant	40	20.7
		Private	30	15.5
		Housewife	94	48.7
		Others	2	1
7	Marriage length (n=193)	≤ 1 year	2	1
		2-5 years	71	36.8
		5-10 years	97	50.3
		>10 years	23	11.9
8	Birth order/parity (n=193)	1 child	30	15.5
		2-4 children	149	77.2
		≥ 5 children	14	7.3
9	Family monthly income(ETB) (n=193)	<500	13	6.7
		500-1000	40	20.7
		1000-1500	21	10.9
		1500-2000	29	15
10	Estimated distance from health facility (minutes) (n=193)	≥ 2000	90	46
		<10	95	49.2
		Oct-20	70	36.3
		20-30	25	13
		>30	3	1.6

**Table 2:** Male involvement in Antenatal care in Jima Arjo town, Oromia Regional State, Ethiopia 2018 G.C.

Variables	Categories	Frequency (n)	Percentage (%)
Do you accompany your partner for (ANC)? (n=193)	Yes	157	81.3
	No	36	18.7
Did you involved in PMTCT with your partner? (n=193)	Yes	91	47.2
	No	102	52.8
Do you help your partner in domestic household tasks? (n=193)	Yes	157	81.3
	No	36	18.7
Do you think Husband should accompany his during ANC (n=193)	yes	180	93.3
	No	13	6.7

**Table 3:** Male partner's knowledge of danger sign during pregnancy, labour and delivery and postpartum.

S.no	Variable	Option			
		Yes		No	
		Freq (no)	Per (%)	Freq (no)	Per (%)
1	Danger sign during pregnancy	172	89.1	21	10.9
	Vaginal bleeding during pregnancy	155	90.1	17	9.9
	Absent or reduced fetal movement	2	1.2	170	98.8
	Swollen face/hand	67	39	105	61
	Seizure/convulsion	1	0.6	171	99.4
	fever	78	45.3	94	54.7
	Leakage of fluid per vagina	66	38.4	106	61.6
	Others (specify)	1	0.6	171	99.4
2	Danger signs and symptoms during labor and delivery	132	68.4	61	31.6
	PROM (premature rupture of membrane) is danger sign	42	31.8	90	68.2
	Retained placenta	3	2.3	129	97.8
	Prolonged labour	112	84.8	20	15.2
	Others (specify)	3	2.3	129	97.7
3	Danger signs and symptoms during post-partum period	169	87.6	24	12.4
	Severe bleeding is danger sign?	120	71	50	29
	Severe headache	72	42.6	96	57.4
	Blurred vision	70	41.4	99	58.6
	High fever	32	18.9	136	81.1
	Mal odor vaginal discharge	2	1.9	166	98.1
	Severe weakness	68	40.2	102	59.8
	Others	1	0.6	169	99.4
4	Neonatal danger signs and symptoms during postpartum	133	68.9	60	31.1
	Difficulty of breathing	23	17.3	112	82.7
	Unable to suck	65	48.9	69	51.1
	Umbilical bleeding	77	57.9	58	42.1
	Skin color change	22	16.5	113	83.5
	High fever	56	42.1	79	57.9



### Male involvement in birth preparedness and complication readiness in Jima Arjo town

In this study male partner's practice at more than five components were considered in birth preparedness. The overall birth preparedness and complication readiness practice among married male in Jima Arjo Town was 132 (68.4%) and about 166

(86%) saved money for delivery, 178 (92.2%) arranged Skill Birth Attendant for delivery (SBA), 137 (71%) arranged transportation for delivery, 186 (96.4%) identified place of delivery, 175 (90.7%) prepared essential items for clean delivery and postpartum care, 187 (96.9%) identified health facilities provided for 24 hrs an emergency Obstetrics care and only 35 (18.1%) had arranged potential blood donor (**Table 4**).

**Table 4:** Male involvement in birth preparedness and complication readiness in Jima Arjo Town, Oromia Regional State, Ethiopia 2018 G.C.

Variables	Categories	Frequency (n)	Percentage (%)
Have you made birth plan for?	Yes	132	68.4
	No	61	31.6
Do you saved money for emergency expense? (n=193)	Yes	166	86
	No	27	14
Did you arrange skill birth attendant for delivery (SBA) (n=193)	Yes	178	92.2
	No	15	7.8
Did you arrange transportation for delivery? (n=193)	Yes	137	71
	No	56	29
Have you prepared essential items for clean delivery and postpartum care? (n=193)	Yes	175	90.7
	No	18	9.3
Did you identify place of delivery? (n=193)	Yes	186	96.4
	No	7	3.6
Have you arranged blood donor? (n=193)	Yes	35	18.1
	No	158	81.9
Have you identified institution with in 24 hr of Emergency Obstetrics Care? (n=193)	Yes	187	96.9
	No	6	3.1

### Factors associated with birth preparedness and complication readiness among married male at bivariate logistic regression analysis

The results of bivariate analysis showed that, some socio demographic characteristics, knowledge level of partners about birth plan preparedness and complication readiness and male involvement in ANC were found to have association with Male involvement in birth preparedness and complication readiness. Bivariate analysis showed that, partner who can't read and write (COR=0.05 (95% CI=0.504-0.574), those able to read and write (COR=0.274 (95% CI=0.08-0.0932) were less likely to participate on BP/CR when compared to those partners attained educational status of college and above. Husbands who had one child were 4 times (COR=4.00 (95% CI=1.009-15.862) more likely to participate in birth preparedness compared to husbands who had >5 children. The male partners who have ever heard about birth plan preparedness and complication readiness were about 3 times (COR=2.7 (95% CI=1.154-6.356) more likely to participate in BP/CR compared to partners who never heard about BP/CR. Husbands who accompany their wife for ANC were 6 times (COR=5.54 (95% CI=2.56-11.98) more likely to practice in birth plan preparedness and complication readiness compared to those who were not accompanying their wife for ANC. In addition, partners who were not involved in domestic household tasks were 82% (COR=0.18 (95% CI=0.083-0.39) less likely involved in BP/CR compared to husbands who were involved in domestic activities. Husbands knowledge on danger signs during pregnancy, delivery, postpartum and neonates found to affect male involvement in BP/CR. Partner who had poor knowledge

(COR=0.11 (95% CI=0.3-0.416) were 89% less likely to involve in BP/CR compared to partner who had better knowledge on danger sign during pregnancy, delivery, postpartum and neonates

### Factors associated with birth preparedness and complication readiness practice among married male partner at multivariate logistic regression analysis

Multivariate analysis was done for selected independent variable with outcome variable. Factors that remained significantly associated with male involvement at birth preparedness and complication readiness were knowledge of husbands on danger signs during pregnancy, delivery, postpartum and neonates, partner's educational status and husband's involvement in domestic household tasks. Multivariate analysis showed that, husbands who can't read and write (AOR=0.056, 95% CI=0.04-0.761) were less likely to involve in BP/CR compared to partners attained educational status of college and above. Partners involved in domestic household activities were 3 times (AOR=3.27, 95% CI=1.346-7.918) more likely to practice birth plan preparedness and complication readiness compared to partners who did not help their wife in domestic activities. Knowledge level of male on danger signs during pregnancy, labor, delivery, postpartum and a neonate was found to be significant factor influencing male involvement in birth plan preparedness and complication readiness. Married male who had poor knowledge (AOR=0.212, 95% CI=0.05-0.875) were 79% less likely to involve in BP/CR compared to partners who had better knowledge of danger signs (Table 5).

**Table 5:** Multivariate and Bivariate analysis of selected variables affecting birth preparedness and complication readiness practice among married male in Jima Arjo Town, Oromia Regional state, Ethiopia, 2018 G.C.

Variables	Male involvement in Birth plan and complication readiness				
	Total	Yes frequency (%)	No frequency (%)	COR (% CI)	AOR (% CI)
Educational status of husband					
Can't read and write	5	1 (20)	4 (80)	0.05 (0.004-0.0574)	0.056 (0.04-0.76)
Read and write	45	26 (57.8)	19 (42.2)	0.274 (0.008-0.932)	0.397 (0.103-1.53)
Primary school	53	34 (64.2)	19 (35.8)	0.358 (0.107-1.202)	0.344 (0.012-1.292)
High school	66	51 (77.3)	15 (22.7)	0.680 (0.201-2.199)	0.675 (0.18-2.538)
College and above	24	20 (83.3)	4 (16.7)	1.0 (Ref)	
Birth order					
1	30	24 (80)	4 (20)	4.00 (1.009-15.862)	3.68 (0.715-18.942)
02-May	149	101 (67.8)	48 (32.2)	2.1 (0.699-6.337)	1.801 (0.48-6.76)
>5	14	7 (50)	7 (50)	1.0 (Ref)	
Have you ever heard about BP/CR					
No	25	12 (48)	13 (52)	0.369 (0.157-0.866)	0.96 (0.315-2.924)
Yes	168	48 (28.6)	120 (71.4)	1.0 (Ref)	
Do you accompany with your wife during ANC					
No	157	119 (75.8)	38 (24.2)	5.54 (2.56-11.98)	2.387 (0.935-6.092)

Yes	36	13 (36.1)	23 (63.9)	1.0 (Ref)	
Do you help your wife in domestic household tasks?					
No	36	13 (36.1)	23 (63.9)	0.18 (0.083-0.39)	3.27 (1.346-7.958)
Yes	157	119 (75.8)	38 (24.2)	1.0 (Ref)	
Knowledge of danger signs during pregnancy, labor, delivery, postpartum and neonate					
Poor knowledge	51	24 (47.1)	27 (52.9)	0.11 (0.3-0.416)	0.212 (0.05-0.875)
Good knowledge	115	84 (73)	31 (27)	0.339 (0.095-1.205)	0.42 (0.113-1.582)
Better knowledge	27	24 (68.4)	3 (31.6)	1.0 (Ref)	

## Discussion

This study depicted male involvements in birth preparedness and complication readiness and associated factors among married male at Jima Arjo town.

In this study husbands involved in more than five components were considered as participated in birth preparedness. Majority of married male were found involved in birth preparedness and complication readiness. Factors significantly associated with male involvement at birth preparedness and complication readiness were knowledge of husbands on danger signs during pregnancy, delivery, postpartum and neonates, partner's educational status and husbands who involved in domestic household tasks. The overall practice of married of male in birth preparedness and complication readiness was 68.4%. This finding is in line with the study conducted in 2012, Enderta woreda, Tigray Region which revealed 60.4% husbands had good practice and participated in birth preparedness and study conducted in 2015, Mekele town showed about 60% husbands participated in birth preparedness [10].

But magnitude of male involvement in birth preparedness and complication readiness in this study is higher than finding in Ambo town, 2015, which revealed the overall birth preparedness and complication readiness practice among married male was 50.8% and study conducted in 2015, Arba minch, South Ethiopia where only 9.4% male involved in birth preparedness complication readiness. This difference may be due to variation in socio demographic characteristics, sample size or study period. In this study most of married male (86%) saved money for delivery which is higher than study conducted in Ambo town (62.8%), Northern Nigeria (77.1%) and Mekele town (76.3%). Most of the respondents in this study area (92.2%) arranged skill birth attendant for delivery which greater than study conducted in Nepal, Rural Tanzania, Enderta woreda and Ambo town, which revealed 51.8% plan for visiting their wife's to skill birth attendants, 0.8% identified skilled attendant, 51.30% of the respondents reported their wives delivered by skilled birth attendant, and 54.3% arranged Skill Birth Attendant for delivery (SBA) respectively [11].

This study revealed 96.4% of the respondents identified place of delivery where, study conducted in Enderta woreda and Mekele town revealed 42.0% of partners informed to health facility for

their place of childbirth and 62.20% identified place of birth. This may be due to variation in study period or socio demographic characteristics among study area. Regarding potential blood donors; only 35% arranged potential blood donor, this is slightly similar with study conducted in Mekele town (17.30%), but higher than study conducted in Northern Nigeria (3.7%) and Ambo town (12.3%) arranged potential blood donors. This difference may be due to variation of study period or awareness of people about pregnant women is at risk of blood loss during labour and delivery.

In this study the prevalence of male involvement in Antenatal care in Jima Arjo town were 74.6% which is higher than study in Nepal (48%), Northern Nigeria (13.0%), and Harari region, where 19.7% of the women were found to be accompanied by their spouse during their recent ANC visit. In this study 31.7% and 22.5% of married men mentioned vaginal bleeding dander sign during pregnancy and postpartum period respectively. Prolonged labor was known by 38.4% of men and premature rupture of membrane was recognized by 14.4% of men. This study is lower than study conducted in 2015, Arba minch, Ethiopia show that the percentage of men who knew vaginal bleeding related to pregnancy were 34%, and in relation to post-partum period were 32.2%. Prolonged labor was known by only 21.4% of men, while retained placenta was recognized by 19.7%.

This study revealed that 59.6% had good knowledge towards general danger signs of pregnancy, labour and delivery and neonates respectively in the study area. This study higher than the study conducted in rural Tanzania showed that 53% could mention at least one danger sign during pregnancy, 43.9% during delivery and 34.6% during postpartum period. This difference may be due to the tool used to measure the knowledge i.e. who could mention at least one danger sign in case of Rural Tanzania and for this study at least five of obstetrics danger signs.

Multivariate analysis showed that, married male who had poor knowledge on danger signs during pregnancy, labor, delivery, postpartum and neonates were less likely to involve in BP/CR as compared to partners who had better knowledge of danger signs which is in line with study conducted in south Ethiopia, Ambo town, Tigray and Tanzania which showed strong association between men awareness of danger sign of obstetric complications and involvements in birth preparedness practices. In Tigray it was found that, husbands were more likely to participate in birth



preparedness if they had better knowledge in postnatal danger signs.

Study conducted in Rural Tanzania which indicated that birth preparedness was associated with knowledge of danger signs during pregnancy. The study conducted in Ambo town, Oromiya Region, revealed male partner who had good knowledge towards general danger signs of pregnancy, labour and delivery were about 6 times more likely to practice birth preparedness and complication readiness compared to those had poor knowledge. This is in line with the study done in Arba Minch which showed that the respondent who had awareness of danger signs of obstetric complication was two times more likely to be involved in birth preparedness practice than respondents who had no awareness of danger signs of obstetric complication.

### The study has different limitations

The cross sectional study design which cannot establish temporal relationship between outcome variable (male involvement in birth preparedness and complication readiness) and determinant factors. Secondly this study used small sample size which might affect representativeness of the result and comparison with results from other studies.

### Conclusion

Male partner involvement in BP/CR in this study area was relatively high and significant proportion of husbands had good knowledge of danger signs of pregnancy, labour, post-partum period and neonates. Knowledge of danger signs, education of husbands, husbands involved in domestic household activity were found to affect male involvement in birth preparedness and complication readiness. Therefore action should be taken increase male involvement in BP/CR further through increasing awareness of the partner, family and community towards danger signs of pregnancy, labour, postpartum period and neonates which could avert delays at all levels. Further research should be conducted to explore more factors which affect male involvement in BP/CR using advanced and appropriate designs.

### Ethical Consideration

Ethical clearance was obtained from Wollega University, department of Public Health Ethical Review committee. Permission for conducting the study was secured from the Jima Arjo town Health office. Written consent was obtained from all the study participants after they had briefed about the objectives and the aim of the research.

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### Competing Interest

We, authors, would like to declare, that there is no competing interest for the author in conducting this research

### Consent for Publication

Not applicable.

### Availability of the Data and Material

The corresponding author can make the required data and material whenever needed

### Funding

Not applicable.

### Authors' Contribution

RG is the principal investigator involved in the proposal development, analysis of the data, interpretation of the data and report writing. MD and MG involved in preparation of manuscript and reviewing the paper.

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