Research article

Maternity waiting home utilization among women who gave birth in the pastoralist communities of Borana Zone, Ethiopia: A community-based mixed-method study design

Tura Muda Boru [a], Eden Girmaye Tefera [b], Gizachew Abdissa Bulto [b,*], Yonas Sagni Doba [c], Negash Wakgari [b,d], Ephrem Yohannes Roga [b], Gemechu Ganfure [d], Gonfa Moti Geda [e], Maru Mossisa Erena [b]

[a] Elwaye District Health Office, Borana Zone, Ethiopia
[b] Department of Midwifery, College of Medicine and Health Sciences, Ambo University, Ambo, Ethiopia
[c] Department of Midwifery, College of Medicine and Health Sciences, Wachemo University, Hosana, Ethiopia
[d] Department of Pediatrics and Child Health, College of Medicine and Health Sciences, Ambo University, Ambo, Ethiopia
[e] Department of Medicine, College of Medicine and Health Sciences, Ambo University, Ambo, Ethiopia

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ABSTRACT

Background: Maternity Waiting Home (MWH) utilization is valuable for enhancing maternal and neonatal health service utilization. Although few studies have been conducted in non-pastoral areas, more evidence is needed from pastoralist communities. Hence, the study aimed to assess the utilization of MWH and its associated factors among women in pastoralist communities in Ethiopia.

Methods: A concurrent mixed-method design was conducted from 10 Augustto15 September 2021. The cluster sampling technique was used to select the study participants. Qualitative data was collected through focus group discussions and in-depth interviews. Multivariable logistic regression analysis is used to identify significant factors. Qualitative data were thematically analyzed and triangulated with quantitative findings.

Results: Only 13 % (95%CI:10.5–15.6) of women had utilized MWHs. Husbands participation in antenatal care (AOR = 5.54, 95%CI: 2.14–14.35), having caregivers at home (AOR = 2.59, 95% CI: 1.14–4.86), attending pregnant-women conferences (AOR = 5.01, 95%CI: 2.17–11.49), the husband received information about MWH (AOR = 3.6, 95%CI: 1.54–8.49), favorable attitude towards MWH (AOR = 3.15, 95%CI:1.47–6.77), birth during the rainy season (AOR = 0.35, 95% CI: 0.15–0.81) and residing within 10 km of a health center (AOR = 0.15,95%CI:0.04–0.58) were significantly associated with MWH utilization. The main themes that emerged as barriers to MWH utilization were lack of awareness, availability and accessibility of the services, norms and perceptions, lack of decision-making power, family support and women's workload.

Conclusion: The study found low utilization of MWHs. Husbands' involvement, having information about MWHs, a favorable attitude, the season of birth, and distance were significantly associated. Lack of transportation access, norms, and limited awareness of MWH were also found to be barriers to service utilization. Health education to raise awareness about the importance of

* Corresponding author.
E-mail addresses: 2ramuda@gmail.com (T.M. Boru), edengirmaye@gmail.com (E.G. Tefera), gizachab@yahoo.com (G.A. Bulto), yonassagni@gmail.com (Y.S. Doba), negashwakgari@yahoo.com (N. Wakgari), efremjohn27@gmail.com (E.Y. Roga), gemesda7@gmail.com (G. Ganfure), gmoti42@gmail.com (G.M. Geda), mossisamaru@gmail.com (M.M. Erena).

MWHs, enabling transportation access, husbands' involvement, and encouraging women to take an active role in household decision-making are crucial to boosting MWH utilization.

1. Introduction

Maternity Waiting Home (MWH) is a temporary residential area close to or within health facilities. Pregnant women from inaccessible areas or at high risk of obstetric complications can stay until delivery during their final weeks or months of pregnancy. The World Health Organization suggests that MWHs be built near or in health centers or hospitals where vital obstetric services and complications management are given [1,2]. MWH utilization is a valuable approach to expanding the utilization of maternal and neonatal health services, especially for those women living far from health facilities or with limited access to health facilities [3–8]. In Ethiopia, about half of the facilities had waiting homes. About 72.1 % of facilities in the Amhara region and 56.4 % of facilities in the Oromia region had MWHs [7]. The coverage of MWHs in the Borana zone and Elwaye district is about 77 % and 80 %, respectively [9].

Although the Mini Ethiopian Demographic and Health Survey 2019 showed that institutional delivery in Ethiopia had significantly increased from 28 % in 2016 to 50 % in 2019. s It still needs to reach the national target of 76 % of deliveries attended by skilled health personnel, which is set to be achieved by 2024/25 [10,11]. Furthermore, the home delivery rate was higher in pastoralist regions than in other areas, inviting further interventions specific to those regions [12]. Furthermore, the coverage of skilled birth attendants in Elwaye District in 2020 was 37 % [9].

Communities living in pastoralist and hard-to-reach areas had poor access to obstetrics services due to their scattered settlement and mobility, poor infrastructure like telephone access and road conditions, especially during the rainy season, distance between residence and health facilities, transportation accessibility, and community customs [8,13–19]. Hence, MWH has a remarkable effect on facility delivery and maternal and neonatal health outcomes. To tackle those barriers, the Ministry of Health in Ethiopia designed and implemented the establishment of MWH at health facilities to avoid delays and emergency obstetric complications [2,5,8,20–23].

In Ethiopia, studies revealed that MWH utilization ranged from 7 % in the Jimma Zone to 42.5 % in the Gimbo District of Keffa Zone [24]. Similarly, community norms, decision-making power among women, frequency of Antenatal Care (ANC) visits, complications during previous facility delivery, physical barriers, absence of sufficient basic facilities, poor quality and varieties of food, a lack of privacy, and the presence of disrespectful care were associated with MWH utilization [4,5,8,24–30].

Despite the establishment of MWH at various levels of health centers, free ambulance services, and community-level activities to create home delivery-free kebeles, coverage of skilled birth attendance in the study area remained significantly lower than the national and regional targets. The pastoralist community's Cultural and socio-demographic factors differed from those of agrarian areas, and culturally related factors may not be sufficiently addressed by quantitative methods alone.

Although MWH utilization has been proven effective in reducing maternal and perinatal mortality and boosting facility deliveries, there is a paucity of evidence among the pastoralist communities of Borana Zone and Elwaye District. Therefore, the current study aimed to determine the prevalence of MWH utilization and identify factors associated with MWH utilization among pastoralist women who gave birth within the past 12 months in the Elwaye district of Borana Zone, Ethiopia.

2. Methods

2.1. Study area and period

The study was conducted in the Elwaye district from 10 August to September 15, 2021. Elwaye is one of the 13 administrative pastoralist districts of Borana Zone, Oromia Regional State, Ethiopia. It is located in the southern part of the country, about 598 km from Addis Ababa. Currently, the district's total population, as projected from the 2007 national census, is about 50,599. There are five governmental health centers; four have physically separated functional MWHs, two private clinics, and ten functional health posts [9].

2.2. Study design

A community-based concurrent mixed-methods approach was employed using a phenomenological study for the qualitative data among women who gave birth in the last 12 months and health workers in the Elwaye district of Borana Zone, Ethiopia.

2.3. Population

Our study population consisted of all women in pastoralist communities who gave birth within the last 12 months in the rural kebeles of Elwaye district, Borana zone and were randomly chosen. All women who gave birth within the last 12 months in the rural kebeles of the Elwaye district and lived at least six months in the district were included in the study. In contrast, women who gave birth within the last 12 months in the other district living in randomly selected clusters were excluded.

For focus group discussion and key informant interviews, we used women in the pastoral community of Elwaye district who gave birth in the last 12 months in the rural kebeles, rural health extension workers, health care providers working in the ANC unit, and primary health care unit directors in the Elwaye district.

2.4. Sample size determination and sampling procedure

For the quantitative part, the sample size was determined by using Epi-Info 7.2.2 with the assumptions of a 95 % confidence level, a 5 % margin of error, a 50 % proportion of MWH utilization since there is no previous study conducted among the pastoralist communities, a 1.5 design effect, and considering 10 % of the non-response rate, which yields a minimum sample size of 634.

The cluster sampling technique was used to enroll the required sample from the study populations. There were eight rural and one urban kebele found in the district. All rural kebeles in the district were divided into 24 clusters based on 'Zooni',a pre-existing lower administrative structure since all populations in each cluster were homogenous. The last one-year estimates of women who gave birth among those rural kebeles (1468) were obtained from health centers. To estimate the average number of clusters comprised of women equivalent to the sample size, we divided 1468 women by 24 clusters, which is, on average 62 women who gave birth in a cluster. Then, 8 clusters were selected (one from each kebele), and additionally, two clusters were drawn by using simple random sampling from the unselected 16 clusters through lottery methods. During data collection, all women who gave birth within the last 12 months (August 10, 2020 to August 9, 2021) in the selected clusters were interviewed for the study.

The sample size for FGD and KII was determined based on the saturation point during data collection. Four clusters that were not included in the quantitative data were purposively selected for focus group discussion based on their distance, transportation, and telephone service availabilities, and women who gave birth within the last 12 months in the selected clusters were selected based on their experience of MWH utilization (user or non-user) during their last pregnancy. A list of MWH users was obtained from MWH registration in the health centers with their clusters, and non-users were selected from the selected clusters by asking target women through their 1 to 5 network and women's development armies. Key informants were rural health extension workers, health care providers working in ANC units, and primary health care unit directors; they were selected purposively for an in-depth interview.

2.5. Operational definitions

2.5.1. MWH users

Women who stayed in the MWH until she gave birth or until she was referred to a higher facility when she was nearing or at term, irrespective of her length of stay in the MWH during her recent pregnancy [24,25,27,28].

2.5.2. The attitude of women towards MWH

A three-point Likert scale response of eight questions was summed up, and a total score was obtained for each respondent. The sum score was generated by adding individual scores for each item with a minimum and maximum score of 8 (eight) and 24 (twenty-four), respectively.

The mean score was calculated, and then those who scored greater than or equal to the mean were categorized as having a "**favorable attitude**," and those who scored below the mean score were categorized as having an "**unfavorable attitude**" towards MWH utilization [24,25,27,28].

2.6. Data collection tools and procedures for quantitative data

Adapted interviewer-assisted structured questionnaires were used to collect the quantitative data from all eligible women in the selected clusters [5,8,24,25,28–31]. It was initially prepared in English and translated into Afan Oromo with consideration of local context. It was then retranslated to English by a language expert to ensure the consistency of the tool with the initial English version.

Individual women were addressed through visits to all households in the selected clusters by asking eligible women starting from the first contact with households in the selected cluster. Six trained health professionals with a bachelor's degree in nursing or public health collected data, and one senior bachelor's degree and a primary investigator was the supervisor.

The tool contained eight attitude-assessing statements (4 positive and 4 negative), each with a maximum score of 3 and a minimum score of 1. During data collection, both statements were ranked differently (positive statement: agree = 3, neutral = 2, disagree = 1).

2.7. Data collection procedures for qualitative data

Key informant interviews and FGD guides were prepared for qualitative data based on the study's objective. The principal investigator, TMB (MSc candidate), and his assistant (MSc holder), who had experience collecting qualitative data, participated in qualitative data collection. A mobile audio recorder and a short note were simultaneously used to collect data during the in-depth interviews and focus group discussions. Purposively selected women were informed of the study and invited to participate on a specified date, and place after permission was obtained from their husbands. Focus group discussions, which lasted for 54–78 min, were conducted at the centers of selected clusters and villages, considering distance and transportation access. Key informant interviews took 26–43 min and were conducted in a private room or office. The data was initially collected from FGD and Health Extension Workers (HEW) at the kebele level, then from healthcare professionals, and finally from the primary healthcare unit directors at the health center.

2.8. Data quality control and data analysis for quantitative data

Before the actual data collection, one-day training was given to the data collectors, taking into consideration the culture of the

community and the importance of accurate data for decision-making and proper handling of the data. The questionnaire was pre-tested on 32 eligible participants (5 % of the sample) in the Yabello district to ensure clarity, wording, logical sequence, and skip patterns of the questions. Some modifications were made accordingly before starting the actual data collection. The reliability of the attitude tool was calculated, and Cronbach's alpha was 0.905. Participants were interviewed privately to ensure their confidentiality and reduce potential response and social desirability bias. Detailed explanations about the purpose of the study and the importance of the data obtained from a subject were given. Questions were asked in order of sequence from the past to the present, and time was given to encourage memorization. Data collectors at the field level checked the questionnaires for completeness before leaving them with the respondents. The principal investigator regularly checked the completeness and consistency of the data, and necessary corrections were made promptly. The completed questionnaires were kept in a locked filing cabinet until the analysis was complete.

The collected quantitative data was checked for completeness, coded, and entered into Epi Data version 3.1 and exported to SPSS version 23 for analysis. Basic descriptive analyses were done and presented as frequency and percent for categorical variables. For the continuous data, normality tests were done using histogram and normality plot tests before determining statistical methods. After the assumptions of binary logistic regression were checked, bivariable logistic regression analysis was used to identify factors associated with the outcome variable, and variables with a p-value of less than 0.25 in the analysis were considered candidates for a multivariable logistic regression model. In multivariable logistic regression analysis, significant factors associated with MWH utilization were identified based on the AOR with its 95 % confidence interval and a P-value of less than 0.05.

The presence of multi-collinearity between independent variables was checked, and the VIF<10 (VIF <4 for all predictor variables) confirmed assumptions of no multi-collinearity. The Hosmer-Lemeshow goodness of fit test was used to assess the fitness of the final model, and the model was fit at = 1.695 with a p-value of 0.989.

2.9. Data quality control and data analysis for qualitative data

The focus group discussions started after briefing them the guidelines such as, respecting and listening to others idea, and staying focused. All participants were encouraged to participate and got a chance to share their thoughts. The researchers held debriefing sessions with each other between each discussion to discuss whether all topics to be discussed were addressed, how dominant participants were controlled, and how active participation was encouraged to improve the quality of the data collection process in FGD. After each interview, recorded data was checked to see if important questions were addressed.

Qualitative data obtained from focus groups with discussants and key informants was transcribed and translated into English. An investigator read the transcripts several times for overall impressions, and participant quotes were included in the analysis. The translated data were processed and sorted into themes using research questions and a quantitative framework as a guide. The data was analyzed manually based on five thematic areas. The qualitative findings were integrated with the significant quantitative results to interpret the study's findings.

Table 1
Socio-demographic characteristics of women who gave birth within the last 12 months in Elwaye district, Borana zone, Ethiopia, 2021 (n = 622).

Variables	Category	Frequency	Percentage (%)
Age of respondents in years	<25	234	37.6
	25–34	266	42.8
	≥35	122	19.6
Religion	Muslim	136	21.9
	Protestant	124	19.9
	'Wakefeta'	362	58.2
Marital status	Married	595	95.7
	Others[a]	27	4.3
Educational status of the respondents	No formal education	469	75.4
	Primary education and above	153	24.6
Respondents' occupational status	Housewife	361	58
	Pastoralist	177	28.5
	Merchant, Gov't employee or Farmer	84	13.5
Husbands' educational status	No formal education	459	73.8
	Primary education and above	163	25.1
	Secondary and above	7	1.1
Husbands' occupational status	Farmer	63	10.1
	Pastoralist	503	80.9
	Merchant	47	7.6
	Others**	9	1.4

[a] Separated, divorced, widowed, ** private or government employee.

3. Results

3.1. Socio-demographic characteristics of study participants

In this study, 622 women responded completely, making a response rate of 97 %. The mean age of the women was 28 years, with a standard deviation of 6.59 years. About three-fourths, 469 (75.4 %) of the women and 459(73.8 %) of their husbands had no formal education. Regarding their occupation, nearly three-fifths, 361(58 %) of the women were housewives, and 512 (83.4 %) of their husbands were pastoralists (Table 1).

3.2. Reproductive and obstetric characteristics of study participants

About four-fifths 502 (80.7 %) of them had attended ANC at least once. Among study participants, only 196 (31.5 %) women have ever attended an ANC follow-up with their husbands. Over three-fifths of the 406 (65.3 %) women gave birth at home during their most recent pregnancy. Lack of transportation service (37.4 %) is the main reason for home delivery (Table 2). Three hundred thirty-eight (54.3 %) study participants knew at least one danger sign during pregnancy.

Among the study participants, 155(24.9 %) women attended pregnant women's conferences at least once during their last pregnancy, and 130 (20.9 %) received information about MWH utilization with their husbands. About 551(88.6 %) of women live in areas longer than a 10-km radius of the nearest health center. Among women who gave birth in health facilities during their most recent pregnancy, 101 (46.8 %) used motorcycles to get there; ambulances covered only 25.5 % of transportation services to help women return home after delivery (Fig. 1).

3.3. Awareness of women and their attitude towards MWH utilization

More than half 53.9 (53.9 %) of study participants have ever heard information about the existence of MWH in the nearest health center (Table 3). Among study participants, 430(69.1 %) women perceived that MWH doesn't facilitate easy access to obstetric services for mothers and newborns. More than one-third, 226 (36.3 %) of the women perceived that the use of MWH interfered with their cultural practices after delivery. In this study, only 208(33 %) women had a favorable attitude towards MWH utilization during pregnancy (Table 4).

Table 2
Reproductive and obstetric characteristics of study participants among women who gave birth within the last 12 months in Elwaye district, Borana Zone, Ethiopia, 2021 (n = 622).

Variables	Category	Frequency	Percentage
Parity	Primipara	112	18
	Multipara	510	82
ANC follow up during last pregnancy	Yes	502	80.7
	No	120	19.3
Partner ever involved in ANC visit	Yes	196	31.5
	No	426	68.5
Had pregnancy related complication on last pregnancy	Yes	172	27.7
	No	450	72.3
Place of delivery on last Pregnancy	Home	406	65.3
	Health Facilities	216	34.7
Reason for Home delivery(n = 406)	Previous birth was normal/no complication	68	16.7
	Husband was not cooperative	12	3
	There was financial problem	8	2
	Lack of transportation service	152	37.4
	Fear of procedure	42	10.3
	Fear of covid-19 pandemic	19	4.7
	No telephone service	35	8.6
	Labor was too short.	49	12.1
	Don't know sign of labor	9	2.2
	Prefer home delivery	12	3
Who decide on place of the last delivery (n = 622).	Husband	131	21.1
	Jointly	111	16.6
	HCP/HEW	69	11.1
	Herself alone	311	50
Challenge faced during Health Facility delivery (n = 216)	No challenge	59	27.3
	Lack of transportation	102	47.2
	Lack of supporter	14	6.5
	Telephone problem	25	11.6
	Other ([a])	**16**	**7.4**

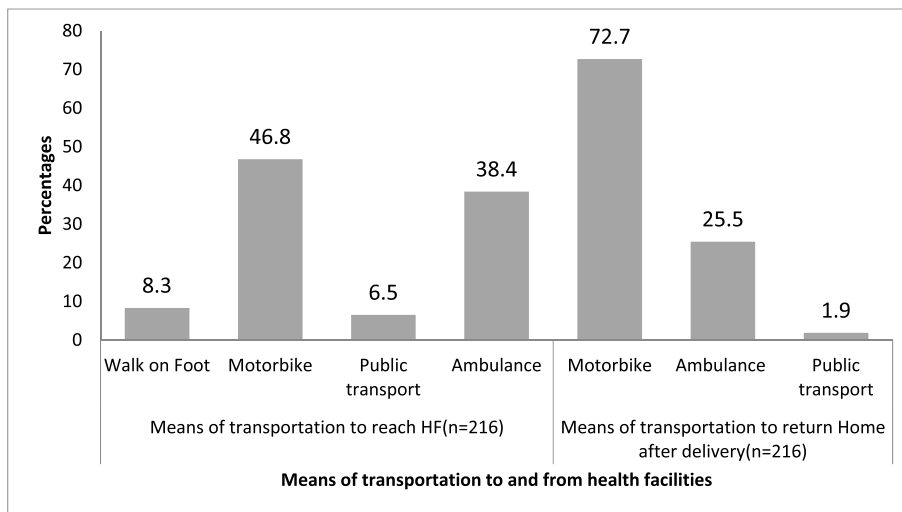[a] Inconvenient road, lack of finance.

Fig. 1. Transportation services used by women who gave birth at health facilities among women who gave birth in the last 12months in the Elwaye district, Ethiopia 2021.

Table 3
Awareness regarding MWH utilization among women who gave birth within the last 12 months in Elwaye district, Ethiopia 2021.

Variables	Category	Frequency	Percent (%)
Ever heard about the availability of MWH in nearest Health Center(n = 622)	Yes	335	53.9
	No	287	46.1
Source of information about MWH(N = 335)	During ANC follow up from HCP	117	34.9
	During pregnant women conference	71	21.2
	HEW during their house-to-house round	88	26.3
	During general community meetings and others events	59	17.6
Know at least one importance of MWH utilization(n = 335)	Yes	258	77
	No	77	23
Importance of MWH(N = 258)	Reduce chance of maternal and neonatal death due to transportation and network problem.	72	28
	Reduces chance of home delivery	101	39.1
	Facilitate easy access to health facilities during labor and complication	59	22.8
	Mother can timely referred to higher facility if complication beyond HC arise	18	7
	Others	8	3.1
Who should use MWH(N = 335)	Don't know who should use	81	24.2
	Pregnant women who live far from HC, and near to their due date.	138	41.2
	Pregnant women who live in area with poor road and transportation access.	87	26
	Pregnant women at high risk of complication (multiple Pregnancy, previous c/s scar)	21	6.2
	Pregnant women who live in area with no/poor network service.	8	2.4
Know time of admission to MWH	Correct	180	50.7
	Incorrect	155	49.3

3.4. Maternity waiting home utilization among the study participants

Out of 622 women, only 81(13 %) (95 % CI = 10.5–15.6) women had used maternity waiting homes during their last pregnancy. The main reasons for MWH utilization were the long distance between their residency and the nearest health facilities, followed by fear of pregnancy and delivery-related complications, which account for 27.2 % and 51.9 %, respectively. Nearly half 40(49.4 %) of the women were sent to MWH through HEWs' referral to health facilities. After admission, the main challenge they faced was an absence of food variety (48 %) and a lack of a cooker in the MWH (16 %). The main barriers to MWH utilization were a lack of transportation service to return home after delivery (58.8 %) (Table 5).

Table 4

Frequency of attitude statements' response towards MWH utilization among women who gave birth in the last 12 months in the Elwaye district of Borana zone, Ethiopia 2021.

Statements	Agree	Neutral	Disagree
MWH utilization has important role in reducing maternal and neonatal mortality and morbidity.	148 (23.8)	296 (45.6)	178 (28.6)
MWH utilization does not interfere with cultural practice following delivery.	122 (19.6)	274 (44.1)	226 (36.3)
MWH utilization reduces chance of home delivery among pregnant women in remote areas.	96(15.4)	252 (40.5)	274 (44.1)
Waiting for delivery at MWHs reduces second delays/challenge related to transportation during obstetric emergency in remote area	98(15.8)	151 (24.2)	373(60)
Separation of pregnant women from her home and/family to stay at MWH to wait her delivery is culturally forbidden.	90(14.5)	153 (24.6)	379 (60.9)
Waiting at MWH does not facilitate easy access of obstetric services to mother and newborn	89(14.3)	147 (23.6)	386 (62.1)
Health center with MWH has no more benefit to the mother and baby than a facility without MWH	75(12.1)	128 (20.6)	419 (67.3)
Waiting for delivery at MWHs does not reduces unnecessary transportation cost during emergency obstetrics	77(12.4)	115 (18.5)	430 (69.1)
Maximum score = 24, minimum score = 8, Mean with standard deviation (SD):12.90(±4.69)			

Table 5

Maternity waiting home utilization related issues among women who gave birth within the last 12months in the Elwaye district of Borana zone, Ethiopia.

Variables	Category	Frequency	%
Main Reason for MWH use (n = 81)	Fear of complications related to pregnancy and delivery	22	27.2
	My home is far from HC, and during emergency I cannot easily arrive at health facilities	42	51.9
	HEW informed and pushed me, that my due date had reached	8	9.9
	My husband pushes me to stay at MWH	4	4.9
	To get better health service and health newborn	4	4.9
	Fear of penalty following home delivery	1	1.2
Means of transportation to MWH(n = 81)	Motorbike	44	54.3
	Ambulance	18	22.2
	Public transport	16	19.8
	Walk on foot	3	3.7
Challenge Faced at MWH(n = 81)	Yes	50	61.7
	No	31	38.3
Types of challenges	Poor hygiene of environment and unattractive compound	2	4
	Loneliness because of departing from family	6	12
	No variety of/adequate food/, shortage of food	24	48
	No cooker'	13	16
	No clean water for drinking or bathing/washing cloth	5	10
How accessed to MWH(n = 81)	HEW given you referral paper	8	9.9
	HEW told orally and sent to health facilities to stay at MWH	40	49.4
	HCP provider working at ANC advise me to stay while I come to ANC f/Up	29	35.8
	My own decision/interest	4	4.9
Duration of stay at MWH before delivery (N = 81)	Within 24hr	7	8.6
	1–7day (one week)	40	49.5
	8-14(2weeks)	27	33.3
	>15day (more than two weeks)	7	8.6
Reason for not using MWH(n = 541)	I don't know about availability of MWH and its importance	25	4.6
	I forget the date/I don't know my due date	21	3.9
	Lack of care giver at home	90	16.6
	My home is near to health facility	27	5
	Because of Road inconvenience	50	9.2
	No free transportation service to return home after delivery and expose us for unnecessary cost	318	58.8
	Other[a]	10	1.9
Caregiver at home during last pregnancy(n = 622)	Yes	303	48.7
	No	319	51.3
Decision maker to use MWH(n = 81)	Husband	15	18.5
	My self	2	2.5
	Jointly(partners)	26	32.1
	Family	6	7.4
	HCP working at ANC clinic and HEW	32	39.5

[a] Fear of covid-19, family or husband refusal, service is inappropriately given, no telephone service to call ambulance.

3.5. Factors associated with the utilization of MWH

On bivariate analysis, age of respondents, religion, women's occupation, transportation access, telephone access, road convenience, season, parity, number of children, knowing at least one danger sign, hearing information about MWH, attitude towards MWH utilization, having caregivers at home, attending the Pregnant Women Conference, complications during last pregnancy, partner receiving information about MWH utilization, decision maker for place of last delivery, partner ever involved in ANC, and travel distance were factors associated with MWH utilization at a P-value of less than 0.25.

Multivariable logistic regression analysis showed that women whose husbands had ever been involved in ANC were 5.5 times (AOR = 5.54, 95 % CI = 2.14–14.35) more likely to use MWH than their counterparts. Having someone who can care for their children and/ or husband at home increases utilization of MWH by 2.6 (AOR = 2.59,95%CI = 1.14–5.86) folds. Women who had complications during pregnancy were 3 times (AOR = 3.06, 95 % CI = 1.32–7.10) more likely to utilize MWH than their counterparts. Pregnant women who attended pregnant women conferences were 5 times (AOR = 5.01, 95 % CI = 2.17–11.49) more likely to utilize MWH than mothers who did not attend. Respondents whose husbands received information about MWH utilization increased by 3.6 folds (AOR = 3.6, 95 % CI = 1.54–8.49) to utilize MWH more than their counterparts. Women with access to transportation used MWH 5 times more than women living in areas with limited transportation access (AOR = 5.25, 95 % CI = 2.37–11.63). Women who gave birth during the rainy season were 65 % less likely (AOR = 0.35, 95 % CI = 0.15–0.81). to utilize MWH than mothers who gave birth during dry seasons. Women with a favorable attitude towards MWH utilization were 3 times (AOR = 3.15, 95 % CI = 1.47–6.77) more likely to

Table 6
Multivariable logistic regression analysis for factors associated with utilization of MWHs among women who gave birth in the last 12 months in the Elwaye district, 2021.

Variables	Category	Utilized MWH		COR (95 % CI)	AOR (95 % CI_)	p-value
		Yes	No			
Age of respondents	<25	19	215	0.48(0.24–0.94)	0.42(0.09–1.84)	0.248
	25–34	43	223	1.05(0.58–1.88)	0.73(0.22–2.46)	0.608
	≥35	19	103	1	1	
Religions	Muslim	12	124	0.63(0.33–1.23)	1.77(0.59–5.25)	0.306
	Protestant	21	103	1.33(0.76–2.33)	0.54(0.197–1.46)	0.22
	Wakefeta	48	314	1	1	
Women's Occupation	Housewife pastoralists	42	319	0.66(0.34–1.27)	0.83(0.19–3.59)	0.26
	Others**	25	152	0.82(0.40–1.68)	2.06(0.79–7.1)	0.70
		14	70	1	1	
Transportation access	Yes	57	174	5.01(3.01–8.34)1	5.25(2.37–11.63)	<0.001[a]
	No	24	367	1	1	
Telephone access	Yes	7	101	0.4(0.2–0.92)	0.38(0.1–1.45)	0.195
	No	74	440	1	1	
Road convenience	Convenient inconvenient	32	139	1.9(1.16–3.07)	1.80(0.74–4.38)	0.195
		49	402	1	1	
Season	Rainy	19	242	0.4(0.22–0.65)	0.35(0.15–0.81)	0.015[a]
	Dry	62	299	1	1	
Parity	Primipara	4	108	0.2(0.08–0.58)	0.31(0.06–1.56)	0.156
	Multipara	77	433	1	1	
Number of children	1–3	41	365	0.5(0.3–0.8)	1.81(0.80–4.09)	0.152
	>3	40	176	1	1	
Know at least one danger sign	Yes	76	262	16.2(6.5–40.6)	3.8(1.20–12.02)	0.023[a]
	No	5	279	1	1	
Heard information about MWH	Yes	80	255	89.7(12.4–649.5)	3.74(0.35–39.99)	0.275
	No	286	1	1	1	
Attitude towards MWH utilization	Favorable unfavorable	50	158	3.91(2.41–6.34)	3.15(1.47–6.77)	0.003[a]
		31	383	1	1	
Caregivers at home	Yes	63	229	4.77(2.75–8.27)	2.59 (1.14–5.86)	0.023[a]
	No	18	312		1	
Attended Pregnant Women Conference	Yes	65	90	20.4(11.3–36.8)	5.01(2.19–11.50)	<0.001[a]
	No	16	451	1	1	
Complication during last pregnancy	Yes	65	107	16.5(9.2–29.6)	3.06 (1.32–7.10)	0.009[a]
	No	16	434	1	1	
Partner received information MWH utilization	Yes	65	65	29.8(16.2–54.5)	3.6 (1.54–8.49)	0.003[a]
	No	16	476	1	1	
Decision maker for place of last delivery	Husband a	24	107	6.8(3.1–14.6)	2.12(0.60–7.49)	0.24
	Jointly	35	76	13.7(6.6–29.2)	3.10(0.92–10.39)	0.67
	HCP/HEW	12	57	6.3(2.6–15.4)	1.04(0.25–4.31)	0.96
	Herself	10	301	1	1	1
Partner ever involved ANC	Yes	71	125	23.6(11.8–47.2)	5.54(2.14–14.34)	<0.001[a]
	No	10	416	1	1	
Distance Travel	≤10 km	5	66	0.47(0.2–1.2)	0.15(0.04–0.58)	0.006[a]
	>10 km	76	475	1	1	

[a] Factors significantly associated with MWH utilizations, **Gov't employee, farmer, merchant.

utilize MWH than their counterparts. Women who had known at least one danger sign during pregnancy and delivery were 3.8 times (AOR = 3.8,95CI1.2–12.02) more likely to utilize MWH than those who did not know danger signs. Women who reside in areas within a radius of 10 km from HC were 85 % (AOR = 0.15,95 % CI:0.04–0.58) less likely to utilize MWH than those living outside of a 10-km radius (Table 6).

3.6. Qualitative data findings

3.6.1. Focus group discussion

Four focused group discussions of 36 women (13 MWH users and 23 non-users) were conducted separately based on their experiences of MWH utilization to explore the barriers to MWH utilization among women in the study area. All participants in the FGD were married or women who gave birth during the last 12 months in the study area.

3.6.2. Key informant interviews

Three primary health care unit directors (PHCUDs), five rural health extension workers, and three midwives working at the ANC unit were interviewed on barriers to MWH utilization among women in the study area.

3.7. Themes emerged as barriers to MWH utilization

3.7.1. Lack of awareness: health and MWH-related information

All study participants do not remember their LNMP (last normal menstrual period), which makes calculating the Expected Date of Delivery (EDD) and missed time of MWH admission difficult, even if they want to use MWH; they count months after a missed period. Health Care Providers (HCPs) also report gestational age using fundal height only, without the estimating EDD, unless she has had ultrasound results. The absence of pregnancy-related complications during previous or recent pregnancies is also one barrier, even if all pregnant women are at risk of developing complications at any time during pregnancy. Even though more than half of the women had information about MWH utilization, the majority of them still did not know who should use MWH or the appropriate time to be admitted to MWH.

"[…] I have received information about the existence of MWH once from HEW, but I don't remember its importance, time of admission, or the services provided." (MWH non-user, 26 years, Para. 2).

"[…] After admission, I saw MWH (similar to my home and constructed from locally available materials with some modifications). Still, I don't know the importance of appropriate time for pregnant women to be admitted there" (MWH non-user).

According to KII, attending pregnant women's conferences, husbands' involvement in ANC visits, husbands' awareness of MWH utilization, caregivers, and good transportation access were major issues that could increase MWH utilization among pregnant women in the study area.

3.7.2. Availability and accessibility of the services

In these pastoralist communities, there needed to be better infrastructure (road convenience, telephone service) and access to services. Women must travel a long distance from their homes to get service from health care providers. The discussants mentioned the lack of free transportation service after delivery to take delivered mothers to their homes, the absence of telephone service to call an ambulance, and inconvenient roads, especially during the rainy season, as the main barriers to MWH utilization, which is the main problem associated with home delivery.

MWH user, 28 yrs., FGD: "[…] my husband asked HC staff to facilitate logistics for my return home after my delivery. They responded: "We have one non-functional motorbike; an ambulance was busy, and priority will be given to laboring mothers."

In another way, the absence of different food items, the shortage of clean water, the absence of a kitchen, and the absence of a cooker at MWH after admission are mentioned as the main challenges at MWH.

"In the MWH, the only available food is rice and strong tea. […] They get gastritis daily after eating. [….] They prefer to drink milk and eat a variety of food at MWH (they expect better food service from HC). The only source of this budget was community contributions, which were sometimes not timely or effectively collected. […] There was no officially recruited person to prepare food for them at MWH." (Midwives: IDIs)

3.7.3. Norms and perceptions

Women perceived pregnancy and delivery as a normal and natural process that could be carried out safely at home with no other intervention or preparation unless complications arose. They perceived MWH as the place reserved for pregnant women with serious complications or problems who cannot give birth at home. Respondents believed that it was culturally inappropriate to keep pregnant women at MWH without any complications and that keeping women at MWH would delay delivery.

"[…] If there is no problem during pregnancy and ANC, there is no need to go to maternity waiting at home. […] i.e., it means calling a complication or problem upon pregnant women, and it would delay delivery. "Everything is in the hands of God, 'Waaqaa'; either waiting at MWH or not is not a matter. […]" (MWH non-user, 28 years old, FGD)

Gender roles in the home are still common in the community, which could affect service utilization among women.

"[…] If a husband or male partner carries firewood and cooks food and someone his age mocks him, why are you doing women's work?" (Non-user of MWH: 28 years; FGD)

3.7.4. Lack of decision-making power

In this study area, women generally have little decision-making power, even regarding where and when to seek health care during pregnancy and childbirth. Husbands have the ultimate authority to make decisions about the pregnant mother's health-seeking practice and/or choose a place of delivery. Uncooperative husbands and husbands' refusal to use MWH can sometimes prevent women from using MWH.

"[…] Some husbands didn't allow their wives to stay at the MWHs. The husbands were the decision-makers; if they refused, there was no choice but to use MWH." (MWH user, FGD)

3.7.5. Family support and women's workload

In this community, women have a great role in the household, meeting their basic daily needs, caring for children, and caring for their husbands, even during pregnancy, almost until their due date. The husband could not be expected to avail firewood and fetch water from distant places, cook food, and care for children (gender role). Women who have a young girl at home can use MWH, but those who don't have someone who handles her role at home cannot use MWH during pregnancy. The discussants mentioned the lack of caregivers at home as the main barrier to utilizing MWH.

"I have two young daughters at home, and I had no concerns about the care of the children and their father while I was at MWH." (36-year-old Para 4, MWH user, FGD)

4. Discussion

The current study identified that only 13 % (95 % CI = 10.5–15.6) of women utilized MWH during their last pregnancy. This finding was lower than the study done in Tanzania, where 31.3 % used MWH [32]. The variation may be due to sociocultural and healthcare system differences between the study areas. Furthermore, the variation might also be due to the difference in the study setting, where this study was community-based, and Tanzania's study was hospital-based among women who came for institutional delivery. This result was lower than the study done in the Gimbo district (42.5 %) [31], Finfinnee special zone, 34.0 % [25], Digalu district of Arsi zone (23.6 %) [28], and Jimma zone (38.7 %) [33]. The variation could be attributed to differences in study settings; this study is conducted in a pastoralist area, whereas the previous studies were conducted in an agrarian area, where the community has more access to health information and better infrastructure than in the current study area. The other possible reason may be the socio-demographic and geographic characteristics of the study area, the settlement of communities, and differences in approach, as a study conducted at Jimma Zone was facility-based while the current study was community-based. Moreover, one possible reason why a lower MWH use was recorded in the current study might be the COVID-19 pandemic, which affects routine healthcare activities, including community mobilization and the fear of women staying at MWHs.

This finding, on the other hand, was higher than the study findings in the Jimma Zone (7 %) [24] and Arba Minch Zuria (8.4 %) [8]. The difference may be due to the level of the study area, as the current study was conducted at the district level. In contrast, the Jimma study was conducted at the zonal level, which may have contributed to poorly performing districts and access to transport for institutional delivery in the case of Arba Minch Zuria. Even though the findings vary, community-based studies have identified low utilization of MWH among women in the country's agrarian and pastoralist areas.

The odds of utilizing MWH among women with transportation access were five times greater than those who did not have transportation access. This finding is consistent with the previous study, in which easy access to transportation in obstetric emergencies increased utilization of MWH [26]. A qualitative study in Ethiopia supports this finding that poor transportation options and inconvenient roads are potential problems associated with MWH utilization for mothers living in distant areas [30].

The odds of utilizing MWH among women who gave birth during the rainy season were lower than those of women who gave birth during the dry season by 65 %. Qualitative findings corroborate this finding, as the rainy season was full of challenges, such as road floods and damage, which occur throughout this season and disrupt transportation services.

Having a favorable attitude towards MWH utilization was positively associated with MWH utilization. This finding is consistent with a study conducted in the East Bellesa district [34]. The similarity might be related to the level of understanding about the importance of MWH utilization among pregnant women, which may change individuals' attitudes.

Women who knew at least one danger sign during pregnancy and delivery were 3.8 times more likely to utilize MWH than those who did not know. This result was consistent with the study conducted in Butajira and Dabat districts in Ethiopia [27,35]. The possible reason for this might be that those who know danger signs might be aware of the obstetric complications they might experience during pregnancy and childbirth, hence using MWH.

Women who lived within a 10-km radius of a health center were 85 % less likely to use MWH than those who did not live within that radius. This finding is consistent with a study conducted in Zambia [29]. The possible reason for this might be that healthcare providers' attention and priority are given to women living in distant areas who do not easily access health facilities during emergencies.

The odds of utilizing MWH for those who had complications during their last pregnancy were three times higher when compared to their counterparts. This finding is similar to the study in Zambia [29] and southern Ethiopia [36]. The possible reason for this might be fear of events that may occur following complications and maybe also the advice from the health care provider to admit them to MWH for close follow-up for those pregnancies with current pregnancy-related complications.

Pregnant women who have support for their child care or husband in their home while staying at MWH were about 2.6 times more likely to use MWH as compared to those mothers who have no support. This finding is similar to previous studies conducted in the Gurage zone [36], Gimbo district of the Keffa zone [31], and Malawi [37]. This could be because having a responsible person at home reduces their concern about activities to be done by the woman while she is at home. This finding is supported by the qualitative finding that women require youth (girls) in their homes to fetch water, provide firewood, feed young calves in an indoor cage, care for children and fathers, and prepare food for shepherds while she is at MWH.

Attending pregnant women's conferences during pregnancy was positively associated with MWH utilization. This finding is supported by the studies conducted in Malawi and Ethiopia [33,38]. According to qualitative findings, attending regular conferences for pregnant women increases their understanding of health information and MWH utilization.

Women with husbands who received MWH information were more likely to use MWH than their counterparts. Previous studies support this result, as the engagement of husbands and communities increases the use of MWHs [38,39]. Male partners who received MWH counseling during their spousal ANC visit had a positive relationship with their wife's MWH utilization [39]. This could be because men who were aware of the benefits of using MWH supported their spouse's use of it.

Women whose husbands had ever been involved in ANC visits during pregnancy were 5.5 times more likely to use MWH than women whose husbands had never participated. This result was in line with a study conducted in Jimma Zone [24]. The possible reason may be the husband's awareness of health information about the availability and importance of MWH utilization during the ANC visit. Additionally, as primary decision-makers on various issues in many families, husbands who were involved in ANC and understood the importance of health services, including MWH utilization, could encourage pregnant women to use MWH.

In the study area, community norms and the wrong perception of MWH were the barriers to service utilization. This conclusion is supported by a study conducted in Zambia [38]. The reason for this could be that HCPs misestimate the expected date of delivery because women need to remember their last normal menstrual period, making it difficult to estimate EDD. As a result, women stay at the MWH longer than expected, leading to the misconception that staying at the MWH prolongs pregnancy and delays the delivery date.

Lack of decision-making power among women is also a barrier to MWH utilization, similar to other studies [29,40,41]. The possible reason for this could be related to the social norms and culture of the communities in which husbands had ultimate authority to make household decisions.

4.1. Strength and limitation of this study

The study used both quantitative and qualitative methods, which allowed the exploration of factors that a single method would not have been able to capture adequately. But as a limitation, the study result was prone to recall bias since the study participants were women who gave birth in the last 12 months.

5. Conclusions

This study revealed low utilization of maternity waiting homes among women in the pastoralist community of the Elwaye district. Transportation access, the season during delivery, attending a pregnant women's conference, having a caregiver for their child care or husband in the home, involvement of the male partner during ANC, the male partner receiving information about MWH utilization, distance from the health center, having complications during pregnancy, having a favorable attitude towards MWH utilization, community norms, and women's decision-making power was significantly associated with the utilization of maternity waiting homes.

Therefore, health workers and all other stakeholders must work on providing health education through different means, including PWC, to promote the utilization of MWHs. Furthermore, encouraging male participation in ANC, facilitating transportation services, strengthening MWHs with necessary facilities, and increasing women's decision-making power were suggested to improve institutional delivery in pastoralist communities. More research is required to investigate male partners' perceptions of maternity waiting home utilization.

Ethics statement

Ethical clearance for this study was obtained from the Ethical Review Board of Ambo University, College of Medicine and Health Science, with reference number AU/PGC/158/2014. Then, the official letter was submitted to the Elwaye district administration and health office, and a permission letter was obtained. Informed written consent was obtained from all study subjects after the nature of the study was fully explained to them in their local language. The participants were informed that their participation was voluntary and that they had the right to continue or withdraw from the study at any point after starting the interview. Data privacy and confidentiality were maintained throughout the study and used only for research purposes. Personal privacy and cultural norms were

respected during data collection.

Data availability statement

The datasets underlying the results presented in the study are not publicly available but are available from the corresponding author upon reasonable request.

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CRediT authorship contribution statement

Tura Muda Boru: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Eden Girmaye Tefera:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Gizachew Abdissa Bulto:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Yonas Sagni Doba:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Project administration, Methodology, Conceptualization. **Negash Wakgari:** Writing – review & editing, Writing – original draft, Visualization, Validation, Project administration, Methodology, Conceptualization. **Ephrem Yohannes Roga:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Methodology. **Gemechu Ganfure:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Methodology. **Gonfa Moti Geda:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Methodology. **Maru Mossisa Erena:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Methodology.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Tura Muda reports financial support was provided by Ambo University College of Medicine and Health Science. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.heliyon.2024.e32925.

List of abbreviations

ANC   Antenatal Care
EDD   Expected Date of Delivery
HCPs   Health Care Providers
HEW   Health Extension Worker
MWHs   Maternity Waiting Homes
PWC   Pregnant Women Conference

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