Determinants of maternity waiting home utilization in Sidama Zone, Southern Ethiopia: A cross-sectional study

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Abstract

Objective
To estimate the magnitude of maternity waiting home utilization and identify its associated factors in Sidama Zone, Southern Ethiopia.

Methods
A community-based cross-sectional study was conducted on a total of 748 mothers who gave birth within the last year in the selected woredas (districts) of Sidama Zone. Data were collected from April 1–30, 2019 by using pre-tested and structured questionnaires. Data were coded and entered into EpiData version 3.5.1 and exported to Stata Version 13 software for analysis. Multivariable logistic regression analysis was performed to identify factors associated with maternity waiting home utilization adjusting for confounders.

Results
The mean (SD) of the age of the mothers was 31.26(6.42). Utilization of maternity waiting home in Sidama Zone was 67.25% (95% CI: 63.79–70.53). Maternity waiting home utilization was positively associated with protestant religion (AOR = 1.7; 95% CI: 1.00–2.82) and having a spouse who can read and write (AOR = 2.0; 95%CI: 1.11–3.66) while it was negatively associated with maternal age of 31–40 (AOR = 0.4; 95%CI: 0.28–0.64) relative to the age group of 20–30, daily laborer occupation of mothers (AOR = 0.2; 95%CI: 0.06–0.76), monthly income under the poverty level (825-1320 EBR) (AOR = 0.6; 95%CI: 0.36–0.92) relative with extreme poverty line (<825 EBR), lack of knowledge about maternity waiting home (AOR = 0.009; 95%CI: 0.002–0.03).

Conclusions
Women who had knowledge about maternity waiting home, had a husband who can read and write and protestant religion followers have higher probabilities of maternity waiting home utilization, whereas women (31–40 years old), daily laborers and whose family...
income is below the poverty level have lower probabilities of maternity waiting home utilization. Therefore, Health education about maternity waiting home utilization, spouse education, and women’s economic empowerment is crucial to enhance maternity waiting home utilization.

Introduction

Maternity waiting home (MWH) is a health facility residential accommodation of pregnant mothers starting from their term period of pregnancy. It is an intervention designed to improve access to skilled deliveries in low-income countries [1, 2].

In low-income countries like Ethiopia maternal morbidity and mortality is high [1, 3]. The utilization of a maternity waiting home is a proven strategy to decrease maternal mortality and stillbirth rate [4–6]. Access to comprehensive emergency obstetric care is limited in Ethiopia. MWHs are part of the strategies utilized to improve access to too hard-to-reach rural populations [4, 7]. A skilled birth attendant is pivotal for decreasing maternal and neonatal mortality, however many women in low and middle-income countries gave birth at home without skilled birth attendants help [1, 8–11]. In developing countries like Ethiopia, 30% of maternal mortality is due to a lack of skilled delivery services [12, 13]. According to EDHS, 2016 report still the coverage of skilled and institutional delivery in the south nation’s nationalities and peoples’ region were only 28.6% and 25.5% respectively [14]. Lower rates of maternal and perinatal death were reported from communities with maternity waiting homes compared with those without maternity waiting homes [12, 15–17].

Different factors affect the utilization of MWHs in Africa; A study in Ghana and Zambia reported that women could only use facility-based delivery services if they obtained permission from their husbands [18, 19]. A study from Kenya reports only 28% of women knew of the existence of the MWH and the majority (95%) reported that they would require their husband’s permission to use it [20].

Despite the long years of existence of this service in Ethiopia, the practice has not been adequately assessed so far [4, 21]. Therefore, this study aimed to estimate the magnitude of maternity waiting home utilization and its associated factors in Sidama Zone, Southern Ethiopia.

Methods and materials

Study design and settings

A Community based cross-sectional study was carried out from April 1-30/2019 among mothers who gave birth in the last one year in the Sidama zone. Sidama Zone is one of the Zones found in the Southern Nations Nationalities and Peoples Regional State (SNNPRS) of Ethiopia.

Sample size and sampling procedure

There are twenty woredas (districts) and two city administrations in the zone. According to the Sidama Zone Health Department, the total population in 2014/2015 was projected to be 3,676,576 [22]. There are seven governmental hospitals, 148 governmental health centers, and 524 health posts in the zone. Regarding human resources for health, the zone had 1857 obstetrics care providers (Physicians, Midwives, Public health officers, and nurses).

The sample size was determined using the software Epi Info version 7 with the following assumptions: 95% confidence interval with 28.18% prevalence of maternity waiting home
utilization [16], with a level of confidence (α) of 0.05, and 5% margin of error (d = 0.05). The sample size for associated factors of maternity waiting home utilization was also calculated considering a confidence level of 95%, power of 80%, a ratio of unexposed-to-exposed of 1, and taking various factors. Then the largest of the calculated sample sizes was taken as a final sample size. Accordingly, distance to the health facility was considered as a factor to utilize maternity waiting homes [1], which yielded a sample size of 340. By considering a design effect of 2 for two-stage sampling, the total sample size was 680. After adjusting for an anticipated 10% nonresponse rate, the final sample size was 748.

The sample size was proportionally allocated for selected woredas and kebeles based on the number of mothers who gave birth within the last year based on a census conducted before the actual study. To select the study participants a simple random sampling procedure was implemented.

**Data collection procedures**

The data were collected through face-to-face interviews by using structured and pretested questionnaires. The questionnaire was prepared by reviewing existing literature, which consists of sociodemographic characteristics, personal characteristics, and obstetric history. The pretest was done on 5% of the sample among mothers with similar characteristics to those included in the study.

Ten (10) obstetrics care providers who have a diploma in midwifery and who were proficient in the local language (Sidamu Afoo) were recruited for data collection. The training was given for two days on the objective, relevance of the study, confidentiality of information, respondents’ rights, informed consent, and technique of interview; two midwives with a Bachelor’s degree were trained and supervised the data collection.

**Data analysis**

Data entry was done using EpiData 3.5.1 and exported to Stata version 13 software for analysis. After exporting the data to stata, data cleaning was done. Then descriptive analysis was done for the data to calculate the frequency, proportion, and distribution. The logistic regression model was utilized to analyze the data. First binary logistic regression was done to check the presence of associations and then the independent variables that had P-value less than or equal to 0.25 will be considered as eligible for multivariable analysis. Then multivariable logistic regression was conducted to check the presence of an association between independent variables and MWH utilization. Adjusted odds ratios with 95% confidence interval were used to decide whether a significant association exists and its strength.

**Ethics statement**

Ethical clearance was obtained from the Institutional Review Board at the College of Medicine and Health Sciences of Hawassa University. Sidama Zone Health Office and management of the respective woreda health offices offered consent to conduct the study. Written consent was gained from the study participants before data collection started. Anonymous questionnaires were used to assure the confidentiality of study participants.

**Results**

**Socio-demographic characteristic of study participants**

A total of 748 mothers participated in the study, with a 99.59% response rate. The ages of the participants ranged from 20 to 61 years with a mean (±standard deviation) age of 31.26 (±6.42) years (Table 1).
Maternity waiting home utilization

In Sidama Zone the prevalence of maternity waiting home utilization is 67.25% (95% CI: 63.79%-70.53%) (n = 501). As listed in Fig 1, there are different reasons mentioned for not

Table 1. Socio-demographic and economic characteristics of study participants in Sidama Zone, southern Ethiopia, April 2019 (n = 745).

| Variables                          | Frequency | Percentage |
|------------------------------------|-----------|------------|
| **Age(years)**                     |           |            |
| 20–30                              | 441       | 59.19      |
| 31–40                              | 245       | 32.89      |
| 41–50                              | 56        | 7.52       |
| 51–61                              | 3         | 0.40       |
| **Religion**                       |           |            |
| Orthodox                           | 97        | 13.02      |
| Muslim                             | 89        | 11.95      |
| Protestant                         | 527       | 70.74      |
| Catholic                           | 32        | 4.3        |
| **Marital status**                 |           |            |
| Married                            | 692       | 92.89      |
| Single                             | 12        | 1.61       |
| Divorced                           | 11        | 1.48       |
| Widowed                            | 30        | 4.03       |
| **Occupation of the mother**       |           |            |
| Housewife                          | 614       | 82.42      |
| Government employed                | 12        | 1.62       |
| Private employed                   | 85        | 11.41      |
| NGO employed                       | 4         | 0.54       |
| student                            | 12        | 1.61       |
| Daily labor                        | 14        | 1.88       |
| Other\†                            | 4         | 0.54       |
| **Occupation of the spouse**       |           |            |
| Farmer                             | 388       | 52.08      |
| Government employed                | 19        | 2.55       |
| Private employed                   | 152       | 33.83      |
| student                            | 8         | 1.07       |
| Daily labor                        | 69        | 9.26       |
| Other\†                            | 9         | 1.21       |
| **Monthly income**                 |           |            |
| <825(extreme poverty)              | 557       | 74.77      |
| 825-1320(under poverty)            | 115       | 15.44      |
| >1320(above poverty)               | 73        | 9.80       |
| **Family size**                    |           |            |
| 2–3                                | 150       | 20.13      |
| 4–6                                | 448       | 60.13      |
| 7–10                               | 147       | 19.73      |
| **Educational status of the mother** |       |            |
| Illiterate                         | 292       | 39.19      |
| Read and write                     | 195       | 26.17      |
| Primary school complete            | 188       | 25.23      |
| Secondary school complete          | 50        | 6.71       |
| Graduated from collage/university  | 20        | 2.68       |
| **Educational status of the spouse** |       |            |
| Illiterate                         | 209       | 28.05      |
| Read and write                     | 223       | 29.93      |
| Primary school complete            | 204       | 27.38      |
| Secondary school complete          | 82        | 11.01      |
| Graduated from collage/university  | 27        | 3.62       |

Other\†: Merchant, Shop keeper other\*: Fisherman, shop keeper.

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Maternity waiting home utilization

In Sidama Zone the prevalence of maternity waiting home utilization is 67.25% (95% CI: 63.79%-70.53%) (n = 501). As listed in Fig 1, there are different reasons mentioned for not
utilizing the maternity waiting home. The most common reason is to enjoy a postnatal ceremony at home in the presence of the family members (37.30%; n = 91) (See Fig 1).

**Factors associated with maternity waiting home utilization**

Maternal age of 31–40 years (AOR = 0.4; 95%CI: 0.28–0.64) relative to age group 20–30, being a daily laborer by occupation (AOR = 0.2; 95%CI: 0.06–0.76), protestant religion (AOR = 1.7; 95%CI: 1.00–2.82), under poverty monthly income(825–1320 EBR) (AOR = 0.6; 95%CI: 0.36–
0.92) relative with extreme poverty (<825 EBR), lack of knowledge about MWH (AOR = 0.009, 95% CI: 0.002–0.03) and spouse who can read and write (AOR = 2.0; 95% CI: 1.11–3.66) relative to illiterate spouses were significantly associated with maternity waiting home utilization (Table 2).

**Discussion**

The prevalence of maternity waiting home utilization in the Sidama Zone is 67.25%. This finding is higher than the finding reported in Gurage (50%) [23], Bench Maji (39%) [24] and Jimma Zone (7%) [25]. The reason for the difference might be the difference in the study participants and study period. The Jimma Zone study was done among 3784 women who were selected from purposively selected districts that have high population density [25].

Mothers in the age group of 31–40 years had 60% lower odds of maternity waiting home utilization compared to mothers in the age group of 20–30 years. This might be because women in this age group may have experienced several home births and therefore reluctant to patronize maternity waiting homes. Women who were protestant religious followers were more likely to utilize maternity waiting (AOR = 1.7). The possible reason might be the religious doctrine which emphasizes sensitive and current issues.

Women who were daily laborers had 80% lesser odds of utilizing maternity waiting homes. This may be because women in this group may likely continue daily work until their due dates of delivery so as to be able to earn a living and provide economic support for their families. Similarly, women whose family income is under the poverty threshold were less likely to utilize maternity waiting homes (AOR = 0.6). This evidence is consistent with the study conducted in Malawi [26].

Women who had a lack of knowledge on maternity waiting homes were also less likely to utilize the maternity waiting home (AOR = 0.009). This evidence is supported by the study conducted in 2017 among low and middle-income countries [27]. The association between lack of knowledge about MWHs and their utilization is not surprising as women who do not know about their existence may also not have knowledge about their beneficial effect and where they are situated and hence unlikely to utilize the facilities.

Women who had a husband who can read and write were more likely to utilize maternity waiting homes (AOR = 2.0). This evidence is consistent with the study conducted in Gurage Zone (AOR = 5.4) [28]. Husbands who are literate are more likely to support utilization of health care services including MWHs. This is consistent with findings from a previous study that evaluated the effect of husband’s education on utilization of maternity services by their wives [29].

This was a community-based study which involved women from all the districts and therefore reflects a true situation regarding the utilization of maternity waiting homes in the zone. However, the cross-sectional study design may have limited exploration of community-level determinants of utilization of maternity waiting homes in Sidama Zone, Southern Ethiopia.

**Conclusion**

Women who had knowledge about maternity waiting home, had a husband who can read and write, and are protestant religion followers have increased probabilities of maternity waiting home utilization, whereas maternal age of 31–40 years, who were daily laborers and whose family income is under poverty level had decreased probabilities of maternity waiting home utilization. Therefore, health education and counseling about maternity waiting home utilization, spouse education, and women’s economic empowerment are crucial to enhance maternity waiting home utilization.
Table 2. Logistic regression analysis results of participants for maternity waiting home utilization in Sidama Zone, southern Ethiopia, April/2019 (n = 745).

| Characteristics                  | Utilize MWH | OR (95%CI)               | Adjusted |
|----------------------------------|-------------|--------------------------|----------|
|                                  | Yes         | No                       | Crude    | Adjusted |
|                                  |             |                          |          |
| **Age**                          |             |                          |          |
| 20–30                            | 72.11       | 27.89                    | 1.00     |          |
| 31–40                            | 56.73%      | 43.27                    | 0.5(0.37–0.70) * | 0.4(0.28–0.64) ** |
| 41–50                            | 78.57       | 21.43                    | 1.4(1.2–2.7) * |          |
| 51–61                            | 0           | 100%                     |          |          |
|                                  |             |                          |          |
| **Marital status**               |             |                          |          |
| Married                          | 67.63       | 32.37                    | 1.00     |          |
| Single                           | 33.33       | 66.67                    | 0.2(0.07–0.80) * |          |
| Divorced                         | 72.73       | 27.27                    | 1.3(0.33–4.85) |          |
| Widowed                          | 70.00       | 30.00                    | 1.1(0.50–2.47) |          |
|                                  |             |                          |          |
| **Religion**                     |             |                          |          |
| Orthodox                         | 57.73       | 42.27                    | 1.00     |          |
| Muslim                           | 58.43       | 41.57                    | 1.0(0.57–1.84) |          |
| Protestant                       | 70.97       | 29.03                    | 1.8(1.1–2.7) * | 1.7(1.0–2.8) ** |
| Catholic                         | 59.38       | 40.63                    | 1.0(0.47–2.41) |          |
|                                  |             |                          |          |
| **Occupation of the mother**     |             |                          |          |
| House wife                       | 68.40       | 31.60                    | 1.00     |          |
| Government employed              | 66.67       | 33.33                    | 0.9(0.27–3.10) |          |
| Private employed                 | 62.35       | 37.65                    | 0.8(0.47–1.22) |          |
| NGO employed                     | 0           | 100                      |          |          |
| Student                          | 100         | 0                        |          |          |
| Daily laborer                    | 28.57       | 71.43                    | 0.2(0.05–0.59) * | 0.2(0.06–0.76) ** |
| Other                            | 100         | 0                        |          |          |
|                                  |             |                          |          |
| **Occupation of the spouse**     |             |                          |          |
| Farmer                           | 67.78       | 32.22                    | 1.00     |          |
| Government employed              | 100         | 0                        |          |          |
| Private employed                 | 63.10       | 36.90                    | 0.8(0.58–1.13) |          |
| Student                          | 100         | 0                        |          |          |
| Daily laborer                    | 66.67       | 33.33                    | 0.9(0.55–1.63) |          |
| Other                            | 66.67       | 33.33                    | 0.9(0.23–3.86) |          |
|                                  |             |                          |          |
| **Family monthly income**        |             |                          |          |
| <825(Extreme poverty)            | 68.22       | 31.78                    | 1.00     |          |
| 825-1320(Under poverty)          | 59.13       | 40.87                    | 0.6(0.44–1.02) | 0.6(0.36–0.92) ** |
| >1320(Above poverty)             | 72.60       | 27.40                    | 1.2(0.71–2.12) |          |
|                                  |             |                          |          |
| **Family size**                  |             |                          |          |
| 2–3                              | 68.00       | 32.00                    | 1.00     |          |
| 4–6                              | 69.87       | 30.13                    | 1.0(0.73–1.62) |          |
| 7–10                             | 58.50       | 41.50                    | 0.6(0.41–1.06) |          |
|                                  |             |                          |          |
| **Educational status of the mother** |         |                          |          |
| Illiterate                       | 61.30       | 38.70                    | 1.00     |          |
| Read and write                   | 71.28       | 28.72                    | 1.6(1.06–2.31) * |          |
| Primary school complete          | 72.87       | 27.13                    | 1.7(1.1–2.5) * |          |
| Secondary school complete        | 52.00       | 48.00                    | 0.6(0.37–1.25) |          |
| Graduated from college/university| 100         | 0                        |          |          |
|                                  |             |                          |          |
| **Knowledge about Mwhu**          |             |                          |          |
| Yes                              | 98.20       | 0.60                     | 1.00     |          |
| No                               | 65.98       | 34.02                    | 0.07(0.04–0.13) * | 0.009(0.002–0.03) ** |
|                                  |             |                          |          |
| **Educational status of spouse**  |             |                          |          |
| Illiterate                       | 61.72       | 38.28                    | 1.00     |          |
| Read and write                   | 77.13       | 22.87                    | 2.1(1.38–3.18) * | 2.0(1.11–3.66) ** |
| Primary school complete          | 61.76       | 38.24                    | 1.0(0.67–1.48) |          |
| Secondary school complete        | 67.07       | 32.93                    | 1.2(0.74–2.16) |          |
| Graduated from college/university| 70.37       | 29.63                    |          |          |
|                                  |             |                          |          |
| **Gravidity**                    |             |                          |          |
| Primigravida                     | 78.68       | 21.32                    | 1.00     |          |
| Multigravida                     | 64.82       | 35.18                    | 0.5(0.32–0.78) * |          |
| Grand multigravida               | 63.95       | 36.05                    | 0.5(0.26–0.88) * |          |

(Continued)
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Author Contributions

Conceptualization: Zelalem Tenaw.
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Methodology: Zelalem Tenaw, Ayalew Astatkie.
Supervision: Zelalem Tenaw.
Validation: Zelalem Tenaw, Ayalew Astatkie.
Writing – original draft: Zelalem Tenaw.
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References

1. Henry EG, Semrau K, Hamer DH, Vian T, Nambao M, Mataka K, et al: The influence of quality maternity waiting homes on utilization of facilities for delivery in rural Zambia. 2017, 14(1):1–10.
2. Vermeiden CJ: Safe Motherhood: Maternity Waiting Homes in Ethiopia to Improve Women’s Access to Maternity Care. University of Groningen; 2019. https://doi.org/10.1186/s12888-019-2210-8 PMID: 31387566
3. Geller SE, Koch AR, Garland CE, MacDonald EJ, Storey F, Lawton BJRh: A global view of severe maternal morbidity: moving beyond maternal mortality. 2018, 15(1):31–43.
4. Gaym A, Pearson L, Soe KJEmj: Maternity waiting homes in Ethiopia—three decades experience. 2012, 50(3):209–219.
5. Bekele BB, Umubyeyi AJMP, Reviews: Maternity waiting homes and skilled delivery in Ethiopia: Review of strategy and implementation to drive sustainable development goals. 2018, 9(3):19–26.
6. Chandramohan D, Cutts F, Chandra RJJJoG, Obstetrics: Effects of a maternity waiting home on adverse maternal outcomes and the validity of antenatal risk screening. 1994, 46(3):279–284.
7. Lerberg PM, Sundby J, Jammeh A, Fretheim AJAjoh: Barriers to skilled birth attendance: a survey among mothers in rural Gambia. 2014, 18(1):35–43. PMID: 24796167
8. Gabrysch S, Campbell OMJBo, childbirth: Still too far to walk: literature review of the determinants of delivery service use. 2009, 9(1):1–18.
9. Lori JR, Munro-Kramer ML, Mduli EA, Musonda GK, Boyd CJJM: Developing a community driven sustainable model of maternity waiting homes for rural Zambia. 2016, 41:89–95.
10. Adewemimo AW, Msuua SE, Olaniyi CT, Adegoke AAJM: Utilisation of skilled birth attendance in Northern Nigeria: a cross-sectional survey. 2014, 30(1):e7–e13. https://doi.org/10.1016/j.midw.2013.09.005 PMID: 24139686

Table 2. (Continued)

| Characteristics | Utilize MWH | OR (95%CI) |
|-----------------|------------|------------|
|                 | Yes | No | Crude | Adjusted |
| Parity          |     |    |       |          |
| Primipara       | 75.84 | 24.16 | 1.00 |          |
| Multipara       | 65.43 | 34.57 | 0.6(0.39–0.91)* |          |
| Grand multipara | 63.10 | 36.90 | 0.5(0.30–0.97)** |          |

*P-value <0.05,
**P-value < 0.05 after adjustment for socio demographic characteristics and some concepts of maternity waiting home utilization.

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References

1. Henry EG, Semrau K, Hamer DH, Vian T, Nambao M, Mataka K, et al: The influence of quality maternity waiting homes on utilization of facilities for delivery in rural Zambia. 2017, 14(1):1–10.
2. Vermeiden CJ: Safe Motherhood: Maternity Waiting Homes in Ethiopia to Improve Women’s Access to Maternity Care. University of Groningen; 2019. https://doi.org/10.1186/s12888-019-2210-8 PMID: 31387566
3. Geller SE, Koch AR, Garland CE, MacDonald EJ, Storey F, Lawton BJRh: A global view of severe maternal morbidity: moving beyond maternal mortality. 2018, 15(1):31–43.
4. Gaym A, Pearson L, Soe KJEmj: Maternity waiting homes in Ethiopia—three decades experience. 2012, 50(3):209–219.
5. Bekele BB, Umubyeyi AJMP, Reviews: Maternity waiting homes and skilled delivery in Ethiopia: Review of strategy and implementation to drive sustainable development goals. 2018, 9(3):19–26.
6. Chandramohan D, Cutts F, Chandra RJJJoG, Obstetrics: Effects of a maternity waiting home on adverse maternal outcomes and the validity of antenatal risk screening. 1994, 46(3):279–284.
7. Lerberg PM, Sundby J, Jammeh A, Fretheim AJAjoh: Barriers to skilled birth attendance: a survey among mothers in rural Gambia. 2014, 18(1):35–43. PMID: 24796167
8. Gabrysch S, Campbell OMJBo, childbirth: Still too far to walk: literature review of the determinants of delivery service use. 2009, 9(1):1–18.
9. Lori JR, Munro-Kramer ML, Mduli EA, Musonda GK, Boyd CJJM: Developing a community driven sustainable model of maternity waiting homes for rural Zambia. 2016, 41:89–95.
10. Adewemimo AW, Msuua SE, Olaniyi CT, Adegoke AAJM: Utilisation of skilled birth attendance in Northern Nigeria: a cross-sectional survey. 2014, 30(1):e7–e13. https://doi.org/10.1016/j.midw.2013.09.005 PMID: 24139686

Table 2. (Continued)
11. Lakew Y, Tessema F, Hailu CJ, Joe, health p: Birth preparedness and its association with skilled birth
attendance and postpartum checkups among mothers in Gibe Wereda, Hadiya Zone, South Ethiopia.
2016, 2016.

12. Lori JR, Munro ML, Rominski S, Williams G, Dahn BT, Boyd CJ, et al Obstetrics: Maternity waiting
homes and traditional midwives in rural Liberia. 2013, 123(2):114–118.

13. Okiogbo CC, Eke AC, Ajorh: Skilled birth attendance in Nigeria: a function of frequency and content of
antenatal care. 2015, 19(1):25–33.

14. CSA: Ethiopian demographic health survey). In. Addis Ababa; 2016.

15. Andermichael G, Haile B, Kosia A, Mufunda JJ: Maternity waiting homes: a panacea for material/
neatal/neonatal conundrums in Eritrea. 2009, 4(1):18–21.

16. Kelly J, Kohls E, Poovan P, Schiffer R, Reddix A, Winter H, et al. Gynaecology: The role of a maternity
waiting area (MWA) in reducing maternal mortality and stillbirths in high-risk women in rural Ethiopia.
2010, 117(1):1377–1383.

17. Dadi TL, Bekele BB, Kasaye HK, Nigussie TJB: Role of maternity waiting homes in the reduction of
maternal death and stillbirth in developing countries and its contribution for maternal death reduction in
Ethiopia: a systematic review and meta-analysis. 2018, 18(1):1–10.

18. Speizer IS, Story WT, Singh KJ, childbirth: Factors associated with institutional delivery in Ghana:
the role of decision-making autonomy and community norms. 2014, 14(1):1–13. https://doi.org/10.
1186/s12884-014-0398-7 PMID: 25427853

19. Siyalubanje C, Massar K, van der Pijl MS, Kirch EM, Hamer DH, Ruiter R: Improving access to
skilled facility-based delivery services: Women’s beliefs on facilitators and barriers to the utilisation of
maternity waiting homes in rural Zambia. 2015, 12(1):1–13.

20. Mramba L, Nassir FA, Ondieki C, Kamata DJ, Obstetrics: Reasons for low utilization of a maternity
waiting home in rural Kenya. 2010, 108(2):152–153. https://doi.org/10.1016/j.ijgo.2009.08.029
PMID: 19892347

21. Vermeiden T, Schiffer R, Langhorst J, Klappe N, Getnet G, et al Health I: Facilitators for
maternity waiting home utilisation at Attal Hospital: a mixed-methods study based on 45 years of experience.
2018, 23(12):1332–1341.

22. Sidama Zone: Socioeconomic and reproductive health annual report. In. Hawassa; 2014/15.

23. Getachew B, Liabsuetrakul T, Gebrehiwot Y: Association of maternity waiting home utilization
with women’s perceived geographic barriers and delivery complications in Ethiopia. The International
journal of health planning and management 2020, 35(1):e96–e107. https://doi.org/10.1002/hpm.2940 PMID:
31691379

24. Nigussie T, Yaekob R, Geremew M, Asefa A: Predictors of Intention to Use Maternity Waiting Home
Among Pregnant Women in Bench Maji Zone, Southwest Ethiopia Using the Theory of Planned Behavior.
The International journal of women’s health 2020, 12:901. https://doi.org/10.2147/IJWH.S267730
PMID: 33149701

25. Kurji J, Gebretsadik LA, Woldfa MA, Sudhakar M, Asefa Y, Kiros G, et al: Factors associated with
maternity waiting home use among women in Jimma Zone, Ethiopia: a multilevel cross-sectional analysis.
2019, 9(8):e028210. https://doi.org/10.1116/bmjopen-2018-028210 PMID: 31467047

26. Singh K, Speizer IS, Kim ET, Leman C, Tang J, Phoya A, childbirth: Evaluation of a maternity
waiting home and community education program in two districts of Malawi. 2018, 18(1):1–14. https://
doi.org/10.1186/s12884-018-2084-7 PMID: 30470256

27. Penn-Kekana L, Pereira S, Hussein J, Bontong H, Chersich M, Munjanja S, et al: childbirt h: Under-
standing the implementation of maternity waiting homes in low-and middle-income countries: a qualita-
tive thematic synthesis. 2017, 17(1):1–12. https://doi.org/10.1186/s12884-017-1444-z PMID:
28854880

28. Vermeiden T, Braat F, Medhin G, Gaym A, van den Akker T, Stekelenburg JB: childbirth: Factors
associated with intended use of a maternity waiting home in Southern Ethiopia: a community-based
cross-sectional study. 2018, 18(1):1–9. https://doi.org/10.1186/s12884-018-1670-z PMID:
29351786

29. Lukonga E, Michelo C: Factors associated with neonatal mortality in the general population: evidence
from the 2007 Zambia Demographic and Health Survey (ZDHS); a cross-sectional study. Pan African
Medical Journal 2015, 20(1). https://doi.org/10.11604/pamj.2015.20.64.5616 PMID: 26090022