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*Review*

# Maternity waiting homes and skilled delivery in Ethiopia: Review of strategy and implementation to drive sustainable development goals

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Improving maternal and child health is foundation for every nations, communities and families. Millennium Development Goals had applied various strategies to overcome the gaps resulted in maternal and child health morbidity and mortality from global to local levels. Among the strategies is maternity waiting home, an important tool-had been addressed those in need of access and hard/difficult to reach for skilled delivery. Consequently, the aim of this review is to narrate the existing strategies, summarized outcome and impact of maternity waiting homes in Ethiopia as well as make recommendations. Four databases were searched to access literatures; they are: Science Direct, Google Scholar, Open Access Journals Search Engine and PubMed. Published literatures and other library sources were explored to get unpublished works in the topic. Boolean connectors were used to connect the key words. Exclusion and inclusion criteria were established. From all databases, five literatures were identified, screened, and included; all were facility based studies. Three were cross sectional, one prospective and the other retrospective cohort in their design of study. Two cohorts studies claimed that there is difference between the outcome of perinatal and mothers following maternity waiting homes utilization. Cohort studies revealed that mothers who utilized maternity waiting homes are less likely to have negative health consequences; themselves and their perinatal. Findings from existing literatures show that there have been significant differences in maternal and perinatal mortality among maternity waiting homes utilizers and non-utilizers, with its own limitations; although no community or facility based studies were conducted. Consequently, it is vital to conduct community based randomized trial to examine the observable effect of maternity waiting homes in improvement of perinatal and maternal health.

**Key words:** Effects, Ethiopia, factors, problems, maternal waiting homes.

## INTRODUCTION

Globally, before 1990, 1600 women were estimated to die each day as a result of complications during pregnancy or childbirth. However, a large proportion of these deaths are preventable (Jowett 2000). In 2015, about 99% of maternal deaths resulting from pregnancy

related complications occurred in low and middle income countries where there is a prevalence of high fertility rates, a low skilled birth attendants, and weak health systems (UNICEF, 2009). From this percentage, sub-Saharan Africa covers makes up 66% (WHO, UNICEF,

UNFPA, 2015).

These maternal deaths result from direct complications during delivery such as hemorrhage, sepsis, obstructed labour, hypertensive disorders of pregnancy and septic abortion (Austin et al., 2014; Biswas et al., 2016; WHO, UNICEF, UNFPA, 2015; World-Health-Organisation n.d.; Valentino and Kenya, 2009; UNICEF, 2009; Thaddeus and Maine, 1994; Singh et al., 2016; Odusola, 2013). The reduction of maternal mortality from obstetric complications cannot be possible unless women exposed to such complications receive timely and adequate obstetric care (Saaka et al., 2017; Ganle, 2016; Broughton et al., 2016; Engmann et al., 2016). Maternal mortality majorly occur due to distance and consequent delay in treatment during childbirth (Irene Figa, 2000).

Also, according to 2013 World Health Statistics, showed that there are gaps in maternal mortality between the poor and rich regions. A high number of maternal and newborn deaths in some areas of the world occurs as a result of inequalities to access health services; this indicates the discrepancy between rich and poor (7,8). As a result, an average maternal mortality in countries with low income, lower middle income, upper middle income and high income groups were 410, 260, 53, and 14/100,000 live births, respectively (WHO, UNICEF, UNFPA 2015). Similarly, the proportion of mothers that do not survive childbirth compared to those that survive in low and middle income regions is still 14 times higher than that of the developed regions (Action, 2015). From this finding, Sustainable Development Goal (SDG) is working to reduce the global maternal mortality ratio to less than 70 per 100,000 live births and to end preventable deaths of newborns as much as possible to 12 per 1000 live birth in each country until 2030 (Derek et al., 2015).

Before 1990 in this country, the maternal mortality was high due to problems emanated from both supply and demand. For supply, lack of qualified health professionals, inaccessibility of health facilities, unavailability of medical supplies, and drugs for those who are in need and hard to reach areas were issues that weaken the health system until the country introduced a 20-year health sector development program in 1977, which is being implemented (Banteyerga, 2011). As regards demand, lack of awareness, negative attitude and poor and harmful traditional practices were prior causes for maternal mortality back in the 1990s (WHO, 2016; WHO, UNICEF, UNFPA, 2015; World-Health-Organisation n.d.).

In 1990, it was 1250 per 100,000 live births (WHO, 2016); but currently it has reduced to one third, from 1250 to 412 per 100,000 live births. This puts Ethiopia 31<sup>st</sup> in the world with average MMR of 412 (273-551) per 100,

000 live births in 2016 (WHO, 2016; FDRE MOH, 2016). In poor and marginalized areas, cost, distance, and the time needed to access care are major barriers for effective utilization of maternal and child healthcare services (IN HEALTH, 2015). A number of innovative strategies to overcome cost, distance, and time barriers to access care were identified and evaluated; they include, community financial incentives, loan/ insurance schemes, and maternity waiting homes. In these areas or regions where maternal and neonatal mortality is high due to inaccessibility of facilities, the strategy to reduce such issue is very vital (World-Health-Organisation n.d.). A maternity waiting home was launched in 1950s and resulted in visible effect to reduce maternal and newborn mortality (WHO, 1996). In Canada, Nicaragua, Guatemala, Timor-Leste Finland carried out major efforts to reduce maternal and neonatal mortality (Cortez, 2012; Ruiz et al., 2013; Singh et al., 2017; WHO, 1996).

The alleviation of maternal mortality catastrophe, so named Maternity Waiting Homes (MWHs) or Maternity Waiting Areas (MWAs), has various names at different settings with similar objective. Although there were plenty of challenges from supply and demand, its utilization had positive impacts in the improvement of maternal and child health in countries launched earlier and later. MWH is defined as a residence near a health facility with emergency obstetric care (EmOC) for mothers who are far from facilities to reside there until delivery and a part of postpartum period.

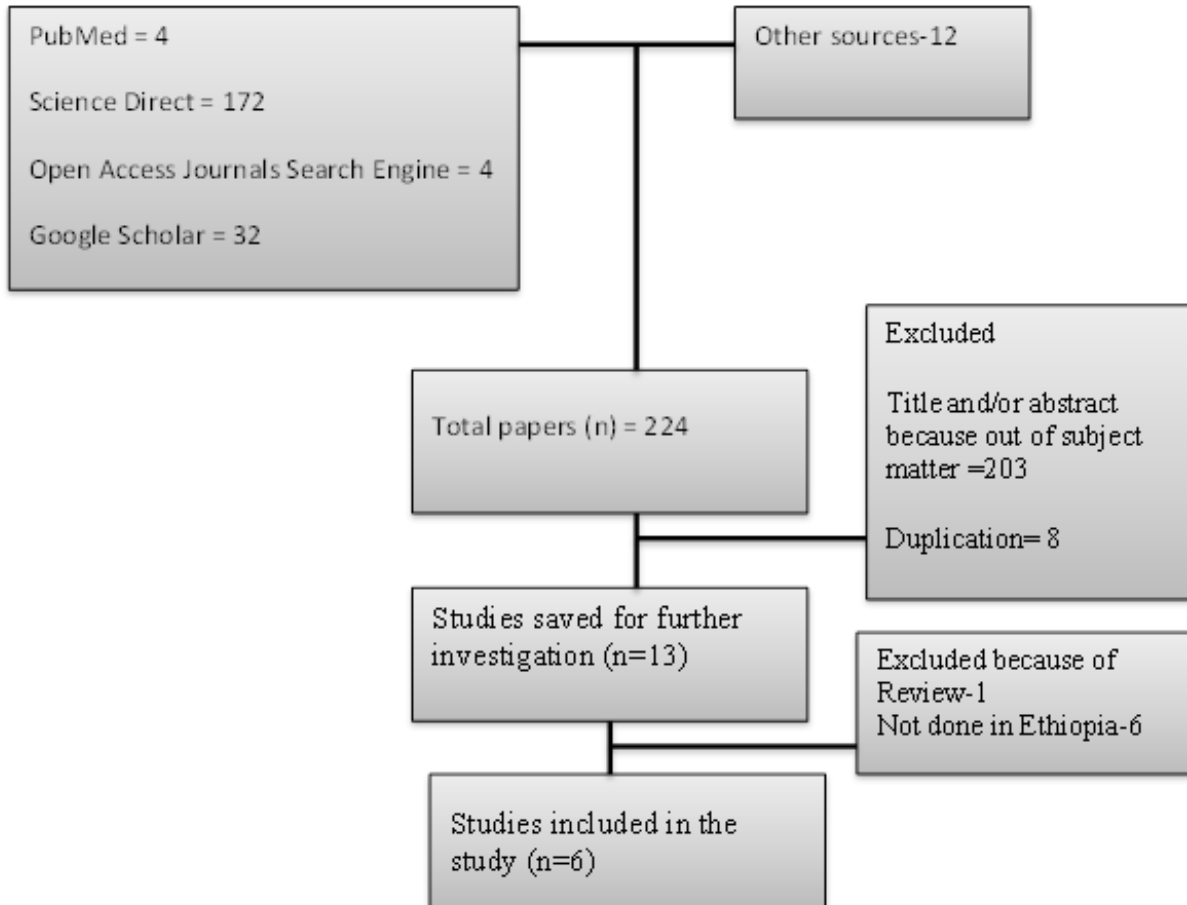
In Africa, most western and eastern African countries were started to use MWHs and studies were conducted to assess the gaps, effectiveness and related topics. For instance Ghana in west Africa, Liberia in east Africa Ethiopia, Eritrea, Zambia, Zimbabwe, Kenya, Malawi were MWHs were launched and various studies were conducted to assess the gaps from different perspectives.

## MATERNITY WAITING HOMES IN ETHIOPIA

Maternity waiting home started in the late 1980s in Ethiopia at hospital level. Although it existed and was available, utilization was not highly encouraged among pregnant women (WHO, 1996). This low utilization resulted from socio-economic, demographic, facility related and culture and custom related constraints. These resulted in high maternal and newborn mortality (Gaym et al., 2012). Even though MWHs started in 1980s, ten years later, 1990, Ethiopia's MMR was 1250 per 100,000 live births (Gaym et al., 2012; World-Health-Organisation n.d.; WHO, UNICEF, UNFPA, 2015). This might illustrate

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**Figure 1.** Key words used to search from different databases.

fewer uptakes of MWHs within that period. In 2014, the Federal Ministry of Health in Ethiopia (FMOHE) designed a policy and strategy which promotes the implementation of MWHs (Ethiopian FMOH, 2005). Even though the country showed good progress in achieving MDGs 3 and 4, still it is an agenda to be solved under SDGs (IN HEALTH, 2015). Consequently, it was believed that MWH is the direct strategy to increase facility delivery, improve newborn and maternal morbidity and mortality (Irene Figa 2000). Consequently, it is necessary to revise the effect of MWH on improving maternal and child health from the very beginning based on existing data.

Therefore, the objective of the narrative short review is to investigate the effectiveness of maternity waiting homes (MWHs) on newborn and maternal health as well as skilled delivery in Ethiopia from MDGs to SDGs.

## MATERIALS AND METHODS

Four databases, PubMed, ScienceDirect, Open Access Journals and Google Scholar, were searched for published work on this topic. Literatures done from 1980s onwards were included. Also, Cochrane database was also searched to check for current evidence of review to know if MWHs was conducted in Ethiopia

(Lonkhuijzen et al., 2012). Key words searching was conducted using Boolean connectors 'AND', 'OR' and 'NOT'. Other sources were searched for further unpublished works to be included in the review (Figure 1).

Three papers were extracted. Two papers were accessed from Google scholar database.

## Inclusion and exclusion criteria

### Inclusion criteria

- 1) Studies conducted in Ethiopia.
- 2) Published in English language.
- 3) Original researches.

### Exclusion criteria

- 1) Only titles accessible.
- 2) Case reports.
- 3) Systematic or narrative review.

## Study participants

- 1) Pregnant mothers.

- 2) Recently delivered mothers.
- 3) Childbearing age women.
- 4) Newborns and neonates.

The papers that met the above criteria from all selected databases were five (Table 1).

## RESULTS

After establishing inclusion and exclusion criteria, six papers met the inclusion and exclusion criteria from all the above databases for further review in the study. All were facility based studies conducted in Ethiopia from 1990s and late 2000s (Endalew et al., 2016; (Gaym et al., 2012; Kelly et al., 2010; Poovan et al., 1990; Tiruneh et al., 2016). Three assessed the outcome and three were focused on the experience, coverage, predictors and contexts of MWHs in Ethiopia.

In 1990, a hospital based prospective cohort with objective of MWHs effects on perinatal and maternal outcome was done (Poovan et al., 1990). Here, 151 mothers used and 635 mothers did not utilize the MWHs, from 1987 to 1990. This study showed that the perinatal mortality among non-utilizers mothers were ten times more than non-utilizers; about 28 and 254 perinatal death per 100,000 live births with RR =0.46 95% CI (0.33-0.66). Also, there is a visible difference in maternal mortality among users and nonusers of MWHs. No mother died among the users and there was 2047 MMR per 100,000 live births. This claimed that there is likely less risk of maternal and perinatal mortality among users than nonusers of MWHs.

Another 22 years retrospective hospital based study conducted in Atat hospital was done in 2010. This showed that there is significant association between maternal and perinatal birth with MWHs utilization (Kelly et al. 2010). In this study, in a total of 24,148 deliveries, 6805 mothers attended MWHs and 17343 mothers did not utilize MWHs. Maternal mortality was 89.9 per 100 000 live births (95% CI, 41.1–195.2) for women who utilized MWHs and 1333.1 per 100 000 live births (95% CI, 1156.2–1536.7) for non-utilizers; stillbirth rates were 17.6 per 1000 births (95% CI, 14.8–21.0) and 191.2 per 1000 births (95% CI, 185.4–197.1). Consequently, there is a significant difference and advantage in decreasing maternal and perinatal mortality among utilizers than non-utilizers.

The third study which was still facility based was done recently in 2012 with objective of describing the existing situations of MWHs in Ethiopia (Gaym et al., 2012). The overviews of the last thirty years history of MWHs were described. They only got information from the Federal Ministry of Health about the existing MWHs in five regions of the country. Based on this information, they assessed only nine facilities (eight hospital and one health center) with MWHs. This study tried to assess the admission criteria, challenges, numbers of utilizers per

each MWHs and duration of the stays. In addition cesarean section rate was higher among utilizers than non-utilizers.

The strengths revealed the introduction period of MWHs in Ethiopia as it was started in 1985. The weaknesses in this study and the described issues are not representatives of the country's status of MWHs phenomena in the last thirty years. This is because they used data from FMoH, which include only five regions, nine MWHs, and have not assessed the maternal and perinatal mortality rate mentioned and studied on MWHs.

Very recently, facility based cross sectional study in 2016 assessed the status quo of MWHs and the experiences and challenges of mothers using waiting homes. It included 134 health centers from four broad regions of the country. More so, it focus mainly on coverage, admission criteria, predictors or challenges as well as prevalence rate of utilization of MWHs among existing and functional MWHs (Tiruneh et al., 2016). However, the study never identified the impact and outcome of MWHs on maternal and perinatal mortality in detail.

The last study was cross sectional facility based, aimed with assessing intention to use maternity waiting home among pregnant women in southwest Ethiopia. This showed that 38.7% of mothers had past history of MWHs utilization. About 48% women reported MWHs are very important to get better pregnancy outcome (Endalew et al., 2016).

However, only one study revealed different predictors of maternity waiting homes utilization. They were schematized as finance, lack of knowledge, privacy, social support, custom and cultural influences and lack of social support. About 50% of MWHs share the sleeping room and only 6% of MWH have curtains for their privacy. After admission to the MWHs, health care workers, especially midwives, performed an initial evaluation of pregnant women. About 87% MWHs reported that a midwife/nurse made round to mothers primarily to follow-up the current pregnancy (Gaym et al., 2012).

## DISCUSSION

This review revealed that there was a significant risk of increasing perinatal and maternal mortality among MWH of non-utilizing mothers. Also having access for MWHs increases the skilled delivery. In addition there are no established standard MWHs admission criteria.

The study done in 1990 by Poovan et al. (1990) and later in 2010 by J Kelly et al showed that there is a significant difference both in maternal and neonatal mortality. Those who did not utilize MWHs have high risk of dying due to pregnancy than those who utilized MWHs (Kelly et al., 2010; Poovan et al. (1990). This study is in line with studies conducted in Zambia, Liberia, Zimbabwe



**Table 1.** Reviewed literatures.

Author, year	Objectives	Participants	Study design	Main finding
Poovan et al. (1990)	Not defined	777 mothers (151 users and 626 non-users)	Facility based Prospective cohort	No established admission criteria for MWHs (locally "tukul"). High risk pregnant mother were assessed by nurse midwives together with TBAs during outreach ANC visit few weeks before expected date of delivery. 13 mothers died among direct admitted mothers while no maternal death occurred among MWH utilizers. This made 2047/100,000 live births MMR and 0 for users. Stillbirths among non-utilizers were 10 times higher than utilizers. That was 28/254/100, 000 live births PMR
Kelly et al. (2010)	Investigating maternal mortality and stillbirth rates among direct admission and utilizers of MWHs	24,148 deliveries (6805 admitted via MWA and 17 343 directly admitted)	Facility based retrospective study	Stillbirth and maternal death is significantly higher among directly admitted women That was "89.9 per 100,000 live births (95% CI, 41.1-195.2) for MWA women and 1333.1 per 100,000 live births (95% CI, 1156.2–1536.7) for non-MWA women; stillbirth rates were 17.6 per 1000 births (95% CI, 14.8–21.0) and 191.2 per 1000 births (95% CI, 185.4–197.1), respectively"
Gaym et al., (2012)	Describing current status of MWHs in Ethiopia	9 MWHs in Ethiopia	Facility based cross sectional study	4-44 mothers utilizing; Duration varies from 3 days to 90 months; Only seven provides food; No reported maternal and newborn outcome following MWH utilization; Not done at mothers level
Endalew et al. (2016)	Intention to use maternity waiting home among pregnant women	387 pregnant women	Facility based cross sectional study	38.7% mothers had past MWH experiences of utilization. No finding on maternal and newborn outcome following MWH
Tiruneh et al. (2016)	Assessing status, challenges and experience	134 health centres	Facility based cross sectional study	70% MWH accessibility, lack of admission criteria, boredom, food problems and lengthy prenatal stay; But no reported effect on maternal and newborn health; Not done at mothers level
Vermeiden et al. (2018)	Examining the impact of an MWH by comparing pregnancy outcomes between three groups of women who gave birth in Attat Hospital and Butajira Hospital: MWH users vs. non-MWH	Two hospitals	Facility based retrospective study	Compared with Attat non-MWH users (n=306) and Butajira women (n=153), Attat MWH users (n=244) were more often multiparous (multipara vs primigravida, less educated (no schooling vs secondary school., primary vs secondary school., poor (poor vs wealthy and further from the hospital(2h 27minvs1h00minand1h12min. Comparing hospital records of Attat MWH users (n=2784) with Attat non-users (n=5423) and Butajira women (n=9472), maternal deaths were 0 vs 20 (0.4%; p=0.001) and 31 (0.3%; p=0.003), stillbirths 38 (1.4%) vs 393 (7.2%) and uterine ruptures 2 (0.1%) vs 40 (1.1%). No significant differences were found regarding maternal deaths and stillbirths between Attat non-users and Butajira women.

and Malawi (Lonkhuijzen et al., 2003; Jody et al., 2014; Chandramohan, 1995; Jody et al., 2013; Singh et al., 2017). No study has been done in Ethiopia to access MWHs effect on skilled delivery. But other studies

from Zambia, Eritrea, Liberia and Laos explained that increasing access of MWHs for mothers in inaccessible areas increases skilled delivery and decreases maternal and perinatal mortality (Andemichael et al., 2010; Sialubanje et al., 2015b;

Sialubanje et al., 2017; Lori et al., n.d.; Eckermann and Deodato, 2008). This might be due to lack of attention toward MWHs as one component of maternal and child health care services.

In this review subjective norm, perceived

behavioral control and previous experience of using maternal waiting home were shown to be important to increase the intention of using maternal waiting home for pregnant women. This means prior experience of MWHs utilization increases future likelihood of use and in turn it increases skilled delivery (Endalew et al., 2016). This is similar with studies conducted in Zambia, Kenya and Malawi (ELS n.d.; Abdulkadir, 2015; Sundu et al., 2017; Sialubanje et al., 2015a).

There are no admission criteria for studies done in MWHs in Ethiopia (Wilson et al., 1997; Singh et al., 2017; Sialubanje et al., 2015b; Mramba et al., 2010; Margaret, 2016; Lori et al., 2016; Jody et al., 2014). This is consistent with other studies in which mothers with dangerous pregnancy history, symptom and signs have to be admitted to MWHs. But according to Knowles, every pregnant woman should be admitted to MWHs (WHO, 2016). The possible suggestion could be all pregnant mothers should be admitted to MWHs regardless of distance and other pregnancy related danger signs (Drewniak and Zeitlin, 2014).

According to existing studies mothers level determinants of MWH utilizations are lack of finance, distance from nearby health facility with MWHs, low social support, cultural influence, custom and lack of knowledge towards MWHs; these hinder mothers from the utilization of MWHs. These findings are similar to studies from Kenya, Liberia, Malawi, Zimbabwe, Zambia, Eritrea, Timor-Leste and Nicaragua (Abdulkadir, 2015; Chandramohan, 1995; Cortez, 2012; Jody et al., 2014; Jody et al., 2013; Margaret, 2016; Sundu et al., 2017; Singh et al., 2017; Sialubanje et al., 2015a; Sialubanje et al., 2017; Sialubanje et al., 2015b; Wild et al., 2015). The distance between mothers' residence and MWHs have no association with perinatal health outcomes (Drewniak and Zeitlin, 2014). This might be due to attitude difference between study settings. At admission, majority were checked for examination by midwives or nurses in Ethiopia; but in Kenya doctors welcome mothers while they come to MWH (Mramba et al., 2010).

### **Strengths and limitations of this review**

#### **Strengths**

The studies included in the paper help to appreciate the cause-effect relationship.

#### **Limitations of the review**

Few published papers were met the inclusion criteria. The important databases like CINAHL, OVID, EMBASE, and SCOPUS were not free for further searching of other published papers related with the topic. This may make the inference difficult. Secondly, one reviewer only searched for published papers and this might be resulted

in less accessing all papers from relevant databases. In addition there is interruption of studies on the MWHs in Ethiopia. The study was first done in 1990 and again in 2000s. This made the updated and continuous effect of MWHs on maternal and perinatal health outcome very difficult.

### **Conclusion**

In Ethiopia, maternal waiting homes have significant importance in reducing maternal and perinatal mortalities. There is no study done on the relationship between MWHs and skilled delivery. In addition, although studies showed that utilization of MWHs have relation with maternal and perinatal health outcome, there was no community based and/or strong study designed previously to study MWHs and skilled/safe delivery. Therefore, conducting community based longitudinal study is mandatory to assess its effect on skilled delivery, perinatal and maternal mortality. Despite of such studies shortage, the existing evidences indicated that the country will have better the progress of SDGs achievement.

### **ABBREVIATIONS**

**MDGs**, Millennium Development Goals; **MMR**, Maternal Mortality Rate; **MWAs**, Maternity Waiting Areas; **MWHs**, Maternity Waiting Homes; **PNM**, Perinatal Mortality; **SDGs**, Sustainable Development Goals.

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### **CONFLICT OF INTERESTS**

The authors have not declared any conflict of interests.

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