Matern Child Health J (2017) 21:760–769
DOI 10.1007/s10995-016-2162-2

Newborn Outcomes and Maternity Waiting Homes in Low and Middle-Income Countries: A Scoping Review

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Published online: 30 July 2016

Abstract *Objectives* Decreasing neonatal morbidity and mortality remains a challenge in low resource settings. Maternity waiting homes (MWHs) may offer a way to better provide perinatal obstetric care and improve newborn outcomes. The purpose of this scoping review is to examine the impact of MWHs on newborn outcomes and to inform the development of targeted interventions and services to decrease neonatal mortality. *Methods* A literature search of four databases in the fields of nursing, medicine and global health was conducted yielding a total of 11 articles included for the review. *Results* Results indicate studies with extremely limited qualitative or quantitative measures of the impact of MWHs on neonatal health. *Conclusions* An exceptionally wide gap in knowledge on the outcomes of neonates born at MWHs was identified through this scoping review of the scientific literature. The review illustrates the need for more research to understand the effectiveness of MWHs on newborn morbidity and mortality. An increased focus on the study of MWHs for improving newborn outcomes in low resource settings merits immediate attention.

Keywords Maternity waiting home · Newborn · Neonate · Low and middle-income countries

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Significance

Research on the impact of maternity waiting homes on neonatal health is limited. This scoping review identified gaps in the literature on the impact of MWHs on newborn outcomes to help inform future research, practice, and policy.

Introduction

An estimated 6.3 million liveborn children worldwide died before the age of 5 years in 2013 (Liu et al. 2015). Of these children, an estimated 44 % (2.8 million) children died in the neonatal period. The neonatal period is defined as the first 28 days of life. Neonatal deaths worldwide are attributable to three main causes: infections, intrapartum conditions, and preterm birth complications (Lawn et al. 2014). Great strides were made in reducing child and maternal mortality in the past two decades as part of an international effort to attain the Millennium Development Goals (MDGs) proposed by world leaders at the United Nations at the beginning of the new millennium. However, the average annual reduction rate in neonatal mortality between 1990 and 2012 was only 2.0 % compared to a reduction for children aged 1-59 months of 3.4 %, and a reduction in maternal mortality between 1990 and 2013 of 2.6 % (Lawn et al. 2014). According to Lawn and colleagues from The Lancet Every Newborn Study Group, if the present neonatal rate of decline continues, it will be over a century before an African newborn baby has the same survival probability as one born in Europe or North America in 2013.

One way to advocate for the health of neonates is by encouraging pregnant women to utilize maternity waiting

homes (MWHs). Maternity waiting homes are residential facilities, located near a qualified medical facility, where women defined as "high risk" can await their delivery and be transferred to a nearby medical facility shortly before delivery, or earlier should complications arise (WHO 2015). Many consider MWHs to be a key element of a strategy to "bridge the geographical gap" in obstetric care between rural areas, with poor access to equipped facilities, and urban areas where services are more available (WHO 2015). The World Health Organization (WHO) maintains that MWHs may offer a low-cost way to bring women closer to needed obstetric care as one component of a comprehensive package of essential obstetric services. Historically, the focus of research at MWHs has been on maternal outcomes (Figa'-Talamanca 1996; Kelly et al. 2010; Lori et al. 2013). Perinatal and newborn health is mentioned in a limited number of articles, (Chandramohan et al. 1995; Lori et al. 2013; Tumwine and Dungare 1996; van Lonkhuijzen et al. 2003) however the research remains unclear with a fragmentary understanding of newborn outcomes at MWHs. Given the aforementioned dearth of evidence, it is both relevant and critical that further research address this gap.

The purpose of this scoping review was to gain a better understanding of the impact of MWHs on newborn outcomes and inform the development of targeted interventions and services to decrease neonatal mortality. The scoping review of the scientific literature was guided by the research question, "Do maternity waiting homes improve newborn outcomes in low resource settings?"

Methods

Design

Scoping reviews aim to map the literature on a particular topic or research area and provide an opportunity to identify key concepts, gaps in the research, and types and sources of evidence to inform practice, policy making, and research (Daudt et al. 2013). The main strengths of a scoping review lie in its ability to extract the essence of a diverse body of evidence and give meaning and significance to a topic that is both developmentally and intellectually creative (Davis et al. 2009). As delineated in the seminal work by Drs. Arskey and O'Malley, authors of "Scoping studies: towards a methodological framework" published in 2005, a scoping study might be undertaken to exam the extent, range and nature of research activity, determine the value of undertaking a full systematic review, summarize and disseminate research findings, or identify gaps in the existing literature. They proposed a five-stage framework for conducting a scoping study which includes identifying the research question, identifying relevant studies, study selection, charting the data and finally collating, summarizing, and reporting the results. Building on Arskey and O'Malley's (2005) framework, Levac et al. (2010) recommend clarifying and linking the purpose and research question; balancing feasibility with breadth and comprehensiveness of the scoping process; using an iterative team approach to selecting studies and extracting data; incorporating a numerical summary and qualitative thematic analysis, reporting results, and considering the implications of study findings to policy, practice or research; and incorporating consultation with stakeholders as a required knowledge translation component of scoping study methodology.

Inclusion and Exclusion Criteria

Inclusion criteria for review included quantitative or qualitative research reports, developing or low- and middle-income countries, newborn or infant mortality, and infant and/or maternal health outcomes related to MWHs. In the absence of a distinct shift in practice at MWHs, an open publication date range was used. The review was limited to publications written in the English language.

Articles were excluded if they included animal research reports, editorials and short commentaries. Systematic and literature reviews not focused specifically on newborn outcomes were also excluded. If the MWH was in a developed or high-income country the article was excluded. Other exclusion criteria included whether the publications focused on infant and/or maternal health outcomes not related to MWHs.

Search Strategy

Using the framework of Arskey and O'Malley (2005) along with recommendations from Levac et al. (2010), a scoping review was undertaken to review newborn outcomes related to morbidity and mortality at MWHs in low resource settings. A search of the scientific literature was conducted with the expert advice of informationists at the Health Sciences Library affiliated with a major university. Four electronic databases were searched using the inclusion and exclusion criteria identified: Cumulative Index to Nursing and Allied Health Literature (CINAHL), Ovid, Scopus, and Global Health. Nursing literature and allied health journals were searched using the CINAHL database. A search of health science articles in the National Library of Medicine's Medline database was conducted in the Ovid platform. The electronic database, Scopus, was searched for multidisciplinary peer-reviewed literature. Finally, Global Health was searched for its international focus on areas of public health, biomedical and life sciences. The four

databases were searched using a list of keywords and synonyms. An example of the search strategy used is shown in Fig. 1.

The search for the keyword 'maternity waiting home' was conducted through phrases and proximity searching, which searches for two or more words in close proximity to one another. The word 'newborn' was searched using synonyms such as neonate, small for gestational age, low birth weight and premature. The keyword 'low and middle-income countries' was searched using synonyms and Mesh headings including but not limited to low and middle-income countries, LMIC, low income country, middle income countries, global health, and developing countries.

Results

One hundred seventy-eight records were retrieved from the database searches and bibliographic review. CINAHL yielded 16 articles, Global Health yielded 24 articles, Ovid Medline yielded 65 articles, Scopus yielded 73 articles, and 3 additional records were identified through bibliographic review. A total of 139 records were screened after deduplication. Of these, 124 records were excluded. The majority of articles (n = 63) were excluded because they did not focus on maternity waiting homes. The remainder of articles was excluded because the study did not occur in a low resource country, was a commentary or editorial, or was published in a language other than English.

The resulting fifteen full-text articles were read in full by the first author using the pre-identified inclusion criteria. An additional four articles were deemed ineligible at this stage in screening because they were systematic reviews. After application of the inclusion and exclusion criteria, a total of eleven articles were included in the scoping review for analysis. The second author performed a confirming check of the eleven articles included in the scoping review. Figure 2 provides a flow diagram summarizing this process.

The eleven articles included in this scoping review were analyzed and are reported in Table 1. Data were extracted from the articles to gain a better understanding of the impact of MWHs on newborn outcomes. Levac et al. (2010) recommend reporting results of scoping reviews by analyzing the data, reporting results, and applying meaning to the results. Data from the scoping review were analyzed to identify gaps in research and appropriate next steps. Table 1 identifies the study design and aims, sample size, results and implication for future research as well as study limitations.

Summary of Results

Andemichael et al. (2009) reported a perinatal death rate of 1.6 % during 11 months following the introduction of MWHs in Eritrea although no data were provided on the perinatal death rate prior to construction of the maternity waiting homes. Perinatal deaths were most common among young, unmarried mothers who came after long hours of labor following failure to deliver their infant at home indicating that the MWHs were not being accessed prior to the onset of labor as they were intended. Chandramohan et al. (1995) noted that women from obstetric high-risk groups who stayed at a MWH reduced their risk of perinatal death by nearly 50 % compared to those who did not using multivariate analysis.

Eckermann and Deodato in Lao (2008) and García Prado and Cortez in Nicaragua (2012) both examined the utilization and perception of MWHs in an effort to reduce maternal and child mortality rates in rural settings. Barriers to MWH use by minority groups identified by Eckermann and Deodato included privacy, birthing position, acceptance of cultural practices, and cost. Garcia Prado and Cortez identified challenges in the dissemination of information, strengthening of postpartum care, financial stability, and strengthening the local management and involvement of the regional government.

Gaym et al. (2012) provided observational evidence regarding reduction in perinatal mortality including that

Population of newborns in developing countries born at MWH: "Infant, Newborn"[Mesh] OR infant* OR newborn* OR neonat* OR small for gestational age OR "low birth weight" OR premature
AND
(("maternity waiting home" OR "maternity waiting homes" OR "maternity waiting house" OR "maternity waiting houses" OR "maternal home" OR "maternal homes" OR "maternal house" OR "maternal houses")) OR (((maternity OR maternal OR birth OR childbirth) PRE/3 (waiting OR shelter OR shelters OR hut OR huts)))

Fig. 1 OVID Medline search strategy. Population of newborns in developing countries born at MWH: "Infant, Newborn" [Mesh] OR infant* OR newborn* OR neonat* OR small for gestational age OR "low birth weight" OR premature. AND, (("maternity waiting home" OR "maternity waiting homes" OR "maternity waiting house" OR "maternity waiting houses" OR "maternal home" OR "maternal homes" OR "maternal house" OR "maternal houses")) OR (((maternity OR maternal OR birth OR childbirth), PRE/3 (waiting OR shelter OR shelters OR hut OR huts)))

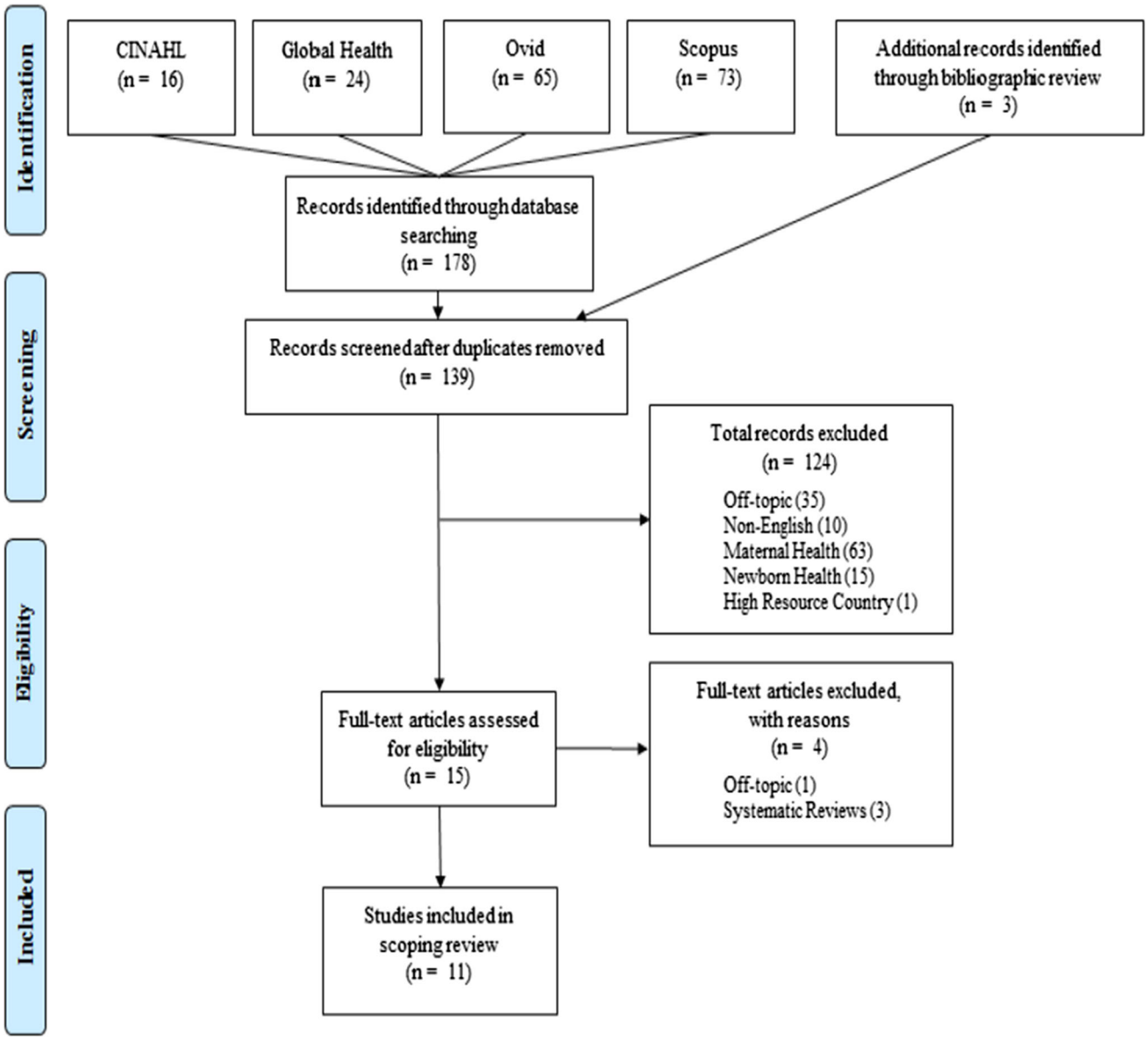

Fig. 2 PRISMA Newborn Outcomes and Maternity Waiting Homes flow diagram

perinatal outcomes among clients attending MWHs were significantly better than non-MWH users. Gaym and colleagues point out that the presence of MWHs in Ethiopia spans more than three decades. According to Gaym, Pearson and Khynn Winn, indications for admission were not standardized or medically clear in some instances and there is a need to formally institutionalize MWH services as part of the care provided at hospitals through clear admission, care and discharge protocols.

Lori et al. (2013a, b) reported lower rates of perinatal death from communities with MWHs when compared to those without MWHs in a two-group comparison study conducted in Liberia. Millard, Bailey and Hanson (1991) reported perinatal mortality was lower in the MWH group and concluded that results may be due to benefits of staying at the MWH or to other unidentified factors. Poovan et al. (1990) noted a stillbirth rate ten times higher among non-MWH users in Ethiopia.

Ruiz et al. (2013) identified MWHs as a strategy with the potential to contribute to the prevention of newborn deaths in rural Guatemala. Ruiz and colleagues identified service users' lack of knowledge about the existence of the homes, limited provision of culturally appropriate care and a lack of sustainable funding as the most important barriers to use of MWHs. A study conducted in Zimbabwe (Tumwine and Dungare 1996) found MWHs can contribute to preventing low birthweight, and to a lesser extent, improve perinatal outcomes. They also noted a need to strengthen

Table 1 Summary of characteristics of articles reviewed for maternity waiting homes (MWHs) and neonatal outcomes in low resource settings

First author, title (year)	Setting	Research design	Aims	Sample size	Results	Implications	Study limitations
Andemichael, Maternity waiting homes: A panacea for maternal/neonatal conundrums in Eritrea (2009)	Eritrea Africa	Quantitative: Delivery records reviewed, self-administered questionnaires to health workers, TBAs, mothers	Assess pregnancy outcomes verified through maternal mortality and perinatal mortality rates at MWHs in hard to reach areas	Heads of 11 health facilities, community leaders, TBAs and mothers at MWHs interviewed (exact number not given), 862 deliveries reviewed	Deliveries in 11 MWHs increased by 56 % with no maternal deaths between Sept 2007–Apr 2009 7 neonatal deaths and 7 still births, making perinatal death rate 1.6 %	Study recommends up scaling strategy due to cost effectiveness and community support	Limited discussion and recommendations regarding peri-natal deaths except to state that deaths were common among young, unmarried mothers who came after long hours of labor and failed to deliver the child at home
ChandramohanThe effect of stay in a maternal waiting home on perinatal mortality in rural Zimbabwe (1995)	Zimbabwe Africa	Quantitative: Hospital-based cohort study conducted at district hospital. Data on antenatal risk, use of antenatal care, access to hospital and stage of labor collected for every delivery at hospital from 1989 to 1991	Evaluate effect of MWH on perinatal mortality	n = 4488 mothers and neonates, 1573 mothers in MWH and 2915 non-MWH	Women who stayed in the MWH had a lower risk of perinatal death compared to women who came directly from home to the hospital during labor. Women from the obstetric risk group who stayed at the MWH reduced their risk of perinatal death by nearly 50 % compared to those who did not on multivariate analysis	The use of MWHs has the potential to reduce perinatal mortality in rural areas with low geographic access to hospitals and merits further investigation	Data for study entered in a log book by six midwives and are subject to limitations of routine health information systems. Study groups not selected randomly and had several differences in risk characteristics
Eckermann, Maternity waiting homes in Southern Lao PDR: The unique 'silk home' (2008)	Lao Asia	Quantitative: demographic, reproductive health and transport data Qualitative: 26 questions in semi-structured interviews and focus group discussions with villagers, chiefs, TBAs, health care providers, and community health workers	Establish whether the MWH concept would be affordable, accessible, and acceptable as a strategy to improve maternal outcomes in remote areas	Exact number of interviews not given, the sample consisted of 18 of the 54 villages (33 %) in Thateng District, total population surveyed n = 7876, total babies born = 326	Major barriers to minority ethnic groups using existing maternal health services (reflected in very low usage of trained birth attendants, hospitals, and clinics) in Thateng exist. The silk home project which combines maternal and infant health services with opportunities for micro credit and income generating activities and allowing non –harmful traditional practices to co-exist alongside modern medical protocols is unique and innovative	Unless MWH are adapted to overcome potential barriers they will not succeed	Large discrepancies between official statics on maternal and infant health outcomes and research data Sample size of MWH usage too low to report statistical analysis

Table 1 continued

First author, title (year)	Setting	Research design	Aims	Sample size	Results	Implications	Study limitations
Garcia Prado, Maternity waiting homes and institutional birth in Nicaragua: policy options and strategic implications (2012)	Nicaragua Central America	Quantitative: econometric analysis of data extracted from surveys conducted in 2006 on a sample of women and traditional birth attendants Qualitative: interviews with key informants	Analyze and examine factors associated with the use of MWH and institutional birth	660 women, 66 TBAs, 18 MWHs	Operation of MWH is usually satisfactory, room for improvement: (i) disseminating information about the homes to both women and men; (ii) strengthening the postpartum care; (iii) ensuring financial sustainability (iv) strengthening the local management and involvement of the regional government	Useful for health policy makers in Nicaragua and in other developing countries considering MWH strategy	No solid qualitative or empirical measures of impact on neonatal outcomes
Gaym, Maternity waiting homes in Ethiopia-three decades experience (2012)	Ethiopia Africa	Quantitative: facility assessment tool, facility checklist, logbook Qualitative: focus group discussions, interviews	Describe the current status of maternity waiting home services in Ethiopia	Total number not provided, 9 MWHs, maximum monthly MWH admission averaged at 25	Indirect evidence that MWHs improved maternal health outcomes while caesarean sections were much higher among clients' admitted to MWHs compared to non-users Provided that MWH service is standardized and institutionalized, it can be one approach to improving access to comprehensive emergency obstetric care for rural mothers in Ethiopia who are challenged by distance to access services	Need to standardize indications for admission to MWHs and formalize the semi-institutionalized care provided	Limited observational evidence presented regarding reduction in neonatal mortality Lack of standardization in type and frequency of data collected and analyzed

Table 1 continued

First author, title (year)	Setting	Research design	Aims	Sample size	Results	Implications	Study limitations
Lori, Maternity waiting homes and traditional midwives in rural Liberia (2013)	Liberia Africa	Quantitative: freq of MWH use, # referrals, presence of skilled birth attendants (SBA) at delivery, proportion of team births, perinatal and maternal outcomes collected from logbooks completed by certified midwives Qualitative: in-depth focus group discussions with traditional midwives (TMs)	Determine whether MWHs increase the use of SBAs as a team and to describe the perceptions of TMs as they engage with SBAs; and to determine whether MWHs decrease maternal and child morbidity and mortality	n = 500 pregnant women, n = 46 TMs, 5 MWHs (intervention group), 5 non-MWH communities (control group)	Communities with MWHs experienced a significant increase in team births from baseline to post-intervention with greater TMs on their integration into health teams. Lower rates of maternal and perinatal death were reported from communities with MWH	Reduction in morbidity and mortality indicates that the establishment of MWHs is an effective strategy to increase the use of SBAs, improve the collaboration between SBAs and TMs, and improve maternal and neonatal health	MWHs opened at different points in time, non-MWH communities started with a larger proportion of team births at baseline, lack of randomization in assigning communities to receive an MWH Limited discussion and recommendations regarding peri-natal deaths except to state that results did not reach statistical significance between the 2 groups
Millard, Antenatal village stay and pregnancy outcome in rural Zimbabwe (1991)	Zimbabwe Africa	Quantitative: data recorded on woman's age, parity, antenatal risk factors, antenatal clinic attendance, and outcome measures	Compare pregnancy outcome for women using antenatal village and those admitted directly from community	n = 486 women using a MWH, 336 non-MWH mothers	Women who stayed in MWH experienced better pregnancy outcome than non-MWH. Birth weight was greater, perinatal mortality lower, and obstetrical intervention less often required in the MWH group	Establishment of MWHs should be evaluated in a broader context, addressing issues such as cost and psychological and family issues which arise from separating women from their families	Lack of randomization, differences between the two groups in antenatal risk factors, and lack of information relating to socio-economic status
Poovan, A maternity waiting home reduces obstetric catastrophes (1990)	Ethiopia Africa	No discussion of design or methods. Assumed retrospective analysis of MWH and hospital records in rural area	Aims not clearly defined. Presentation of MWH, primary health care, and lives saved	n = 151 pregnant women admitted to MWH in 1987, 635 non-MWH admissions	In a rural district of Ethiopia, a MWH for pregnant women at high risk led to a significant decline in maternal and perinatal mortality. The stillbirth rate among non-MWH admissions was ten times higher than among MWH	A MWH close to a rural hospital is vital where women have to travel long distances, transport is poor, and obstetric disasters are frequent	Limited information about live births and neonatal outcomes Poor description of study design, methodology and aims

Table 1 continued

First author, title (year)	Setting	Research design	Aims	Sample size	Results	Implications	Study limitations
Ruiz, Barriers to the use of maternity waiting homes in indigenous regions of Guatemala: a study of users' and community members' perceptions (2013)	Guatemala Central America	Qualitative: interviews with MWH users, family members, community leaders, MWH staff, TBAs, hospital and health facility staff	Identify barriers before, during and after women's stay in MWH	n = 48 people interviewed	MWH users' lack of knowledge about the existence of the homes, limited provision of culturally appropriate care and a lack of sustainable funding were most important problems identified	While the strategy of MWHs had the potential to contribute to the prevention of maternal (as well as newborn) deaths in rural Guatemala, they can only function effectively if they are planned and implemented with community involvement and support, through a participatory approach	No solid qualitative description of impact on neonatal outcomes
Tumwine, Maternity waiting shelters and pregnancy outcome: experience from a rural area in Zimbabwe (1996)	Zimbabwe Africa	Quantitative: All deliveries of MWH and non-MWH deliveries during 2-year period were studied. Statistical analysis with Chi squared test	Evaluate pregnancy outcome of women using a MWH in a remote rural district	n = 280 women using a MWH, 773 non-MWH mothers	MWHs can contribute to preventing low birthweight, and to a lesser extent, improve perinatal outcome	Need to strengthen health care referral systems and to increase efforts to improve other determinants of perinatal and maternal morbidity and mortality	Non-statistically significant perinatal mortality rate comparison between groups presented and insufficiently explained
van Lonkhuijzen, Use of maternity waiting home in rural Zambia (2003)	Zambia Africa	Quantitative: questionnaire filled out by midwives about SES and maternal risk factors from history and the current pregnancy. Chi square and unpaired *t* test used	Assess the results from the use of a MWH in rural Zambia	n = 218 women using a MWH, 292 non-MWH mothers	Although the differences in risk status were statistically significant, no differences were found in birth weight and maternal and perinatal mortality	When dependent on a proper functioning referral system, MWHs can reduce perinatal mortality	Difficult to draw conclusions on effectiveness of MWH by comparing two groups delivering in hospital. Unknown bias may account differences between groups

health care referral systems and to increase efforts to improve other determinants of perinatal morbidity and mortality.

Finally, van Lonkhuijzen et al. (2003) found no differences in birth weight and perinatal mortality between MWH and non-MWH groups. van Lonkhuijzen identified unknown bias may have accounted for the differences between groups, identifying the difficulty in drawing conclusions on the effectiveness of MWHs by comparing two groups delivering in the same hospital. The authors recommended comparing pregnancy outcomes in two separate communities, one with and another without a MWH as was done in the studies by Chandramohan et al. 1995, Millard et al. 1991, and Lori et al. 2013a, b.

Limitations

This scoping review has several limitations. As Arskey and O'Malley (2005) point out, scoping reviews do not appraise the quality of evidence in any formal sense. The scoping review does not address the relative weight of evidence in favor of the effectiveness of any particular intervention but rather provides a narrative or descriptive account of available research (Arskey and O'Malley 2005). Therefore, there are limits to conclusions that can be drawn regarding the strength of evidence of MWHs to improve newborn outcomes.

Potential biases across studies include a lack of randomization and the potential differences between the MWH and non-MWH groups in antenatal risk factors. Five of the studies mentioned a reduction in perinatal mortality in MWH however authors provided limited discussion and recommendations regarding perinatal deaths (Chandramohan et al. 1995; Lori et al. 2013a, b; Millard et al. 1991; Tumwine and Dungare 1996; van Lonkhuijzen et al. 2003).

There were also several strengths identified in these studies. Four of the studies incorporated both qualitative and quantitative methods in their research design (Eckermann and Deodato 2008; García Prado and Cortez 2012; Gaym et al. 2012; Lori et al. 2013a, b) providing greater depth to the overall discussion of the impact of MWHs on newborn outcomes. To closely examine community perceptions, focus group interviews were conducted in three studies (Eckermann and Deodato 2008; Gaym et al. 2012; Lori et al. 2013a, b). Additionally, three studies specifically looked at barriers to access and utilization of MWHs (Eckermann and Deodato 2008; García Prado and Cortez 2012; Ruiz et al. 2013).

Given the variety within the studies identified for this scoping review, it is challenging to provide thematic analysis. Overall, the studies included in the scoping review resulted in limited qualitative or quantitative measures of the impact of MWHs on neonatal outcomes. In general, there were small sample sizes and number of MWHs analyzed in the studies included in this scoping review.

Gaps in the Literature

No controlled trials or longitudinal studies could be identified in the search. While at least five of the studies reported improved outcomes in perinatal mortality rates (Chandramohan et al. 1995; Lori et al. 2013a, b; Millard et al. 1991; Tumwine and Dungare 1996; van Lonkhuijzen et al. 2003), the potential bias inherent in these studies cannot be ignored. None of the studies selected employed randomization and there were differences in pregnancy risk characteristics between groups. The timing of admission for mothers prior to delivery varied between studies. Also, there was a lack of standardization regarding indication for admission in MWHs both within a single study as well as across settings.

Barriers to access and differences in utilization rates of MWHs differed greatly between studies. In some settings, mothers had to pay for medications, food, transport and other user fees to stay at the MWH, (García Prado and Cortez 2012; Eckermann and Deodato 2008; Poovan et al. 1990; Ruiz et al. 2013; van Lonkhuijzen et al. 2003) while at others no payment was necessary (Andemichael et al. 2009; Lori et al. 2013a, b). Furthermore, socio-economic status, educational level, and gender roles–among other factors–play a role in utilization of MWHs.

Discussion

A wide gap in knowledge examining the outcomes of neonates born at maternity waiting homes was identified through this scoping review of the scientific literature. This scoping review illustrates the need for more research to understand the effectiveness of MWHs on newborn morbidity and mortality. An investigation of willingness to use MWHs, barriers, community support, and cost is needed to advocate for better newborn health in low and middle-income countries.

Research to date has focused on describing the impact of MWHs on newborn health in low and middle-income countries in non-specific ways. The majority of research on MWHs has focused on maternal outcomes. There is currently little evidence to support the effectiveness of MWHs on improving newborn outcomes in low resource settings over the standard of care. More research is needed to investigate the impact of MWHs on newborn outcomes and develop a better understanding of factors affecting

newborn outcomes at MWHs. Improvements in the newborn morbidity and mortality rates necessitate the evaluation of the broader cultural context for use of MWHs. One way to advocate for the health of neonates is by encouraging pregnant women to utilize MWHs.

Conclusion

Fortunately, there are glimmers of hope in the articles included in this scoping review. Worldwide use of MWHs could be identified as studies were conducted in Africa (n = 8), Asia and Central America. Five studies in the review found that MWHs do indeed reduce perinatal mortality (Chandramohan et al. 1995; Lori et al. 2013a, b; Millard et al. 1991; Tumwine and Dungare 1996; van Lonkhuijzen et al. 2003).

This scoping review highlights a definite need for development of further research to affirm the potential benefits of MWH utilization to improve newborn outcomes. As we continue our efforts to accelerate the worldwide average annual reduction rate in neonatal mortality, an increased focus on the study of MWHs for improving newborn outcomes in low resource settings merits immediate attention.

Acknowledgments The authors gratefully acknowledge Dr. Barbara L. Brush (The Carol J. and F. Edward Lake Professor of Nursing in Population Health, The University of Michigan School of Nursing) and Emily Ginier, MLIS (Informationist, Taubman Health Sciences Library, University of Michigan). No grants or additional sources of funding supported this work.

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