



Review Article

Traditional birth attendant training programs in low resource countries: an integrative literature review

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ABSTRACT

Background: : Pregnant women continue to die from preventable causes, the greatest number in low-resource countries, where neglect of Traditional Birth Attendant [TBA] training is adversely affecting women with the least access to family planning or a Skilled Birth Attendant. Consideration for TBAs role to strengthen maternity care in low resource settings is recommended. The scope of the TBA role, appropriate training and supervision remains a challenge.

Aim: : This integrative literature review analysed publications about TBA training programs in low-resource countries.

Methods: : A search strategy was implemented incorporating a five-step framework utilising electronic databases. Twenty-five publications were reviewed. Four themes and eleven sub-themes were identified about “TBA training programs in low-resource countries”: (1) Variance in role of TBAs affecting training including subthemes of variance in role, scope and title of TBAs, appointment and remuneration, and articulation of TBA work; (2) Training influenced by where TBAs provide services including areas of high Maternal and Neonatal Mortality, and with low access to health; (3) Educational needs of TBAs, including lack of consensus around specific knowledge and skills, need for culturally appropriate educational needs assessment and importance of education about role of health facilities and referral process; (4) Training and teaching TBAs, including methods, cultural contexts and resources.

Discussion: : There is global confusion about TBA's role within maternity services in low-resource countries, including their title, scope of practice, remuneration, specific training needs and required clinical skills. Community engagement to ensure a culturally applicable role for TBAs, appropriate training information and materials is imperative to ensure sustainability and effectiveness. A gap in knowledge exists around measurable outcomes related to training programs. Recommendations are offered to incorporate TBAs into the maternity healthcare system for low resource settings.

Introduction

Since 2000, the global Maternal Mortality Ratio [MMR] has fallen by 38% (World Health Organisation [WHO], 2019). However, women continue to die from preventable causes such as infections and complications during pregnancy or birth, in low-resource settings in low to middle income countries [LMICs] (WHO, 2019). The current WHO target for MMR is less than 70 maternal deaths per 100,000 by the year 2030 (WHO, 2023). Maternal and newborn deaths are highest where access to quality, basic health services is obstructed due to a lack of infrastructure, health professionals, geographical challenges and transport, and displacement of people due to war or environmental disasters (WHO, 2019; Dey et al., 2024; Dynes et al., 2012).

In low-resource settings in LMICs the neonatal outcomes are even worse. An estimated 98% of stillbirths and neonatal deaths occur in these locations (Shukla & Carlo, 2022; Dey et al., 2024). The causes of

these deaths have been attributed to births with untrained birth attendants, labouring and birthing without support, and limited access to a health facility with adequate equipment or skilled staff (Shukla & Carlo, 2022). Timely identification of maternal and neonatal risk factors is key to reducing perinatal morbidity, mortality, stillbirths and neonatal deaths in low-resource settings in LMIC (Shukla & Carlo, 2022).

Traditional Birth Attendants [TBA] are trusted, community-based birth attendants in low-resource settings in LMICs, therefore it is important to consider training TBAs to identify early warning signs or risk factors to enable timely transfer to health facilities to improve maternal and neonatal outcomes (Fotso et al., 2020; Haruna, 2019; MacDonald, 2022; Janti, 2020; Mwoma et al., 2021). There is a growing body of research reporting that training TBAs has a positive impact on maternal and neonatal health outcomes through improved identification of complications and referral to health facilities, early newborn care including breastfeeding in the first hour after birth and resuscitation

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practices (Nacht et al., 2022; Musie & Fhumulani, 2024; Musie et al., 2022; Sarmiento et al., 2022; Fotso et al., 2020; Sibley et al., 2009; 2014; Sibley et al., 2004).

Since 1997, the number of programs and funding for TBA training around the world has reduced. The interpretation of a joint statement by WHO, United Nations Population Fund and Maternal Child Health in the 1997 Safe Motherhood Initiative Report appears to have contributed to this strategic redirection of funds away from TBA training (WHO, 1999). The report suggested that “training of TBAs alone, in the absence of back-up from a functioning referral system and support from profession trained health workers, is not effective in reducing maternal mortality rates,” (WHO, 1999, p26). Since then, efforts have been directed to training Skilled Birth Attendants [SBAs] such as midwives and doctors (WHO, 1999).

Training TBAs has become a controversial topic and they have become marginalised, even outlawed in some countries such as in Ghana and Sudan, which has created tension between community-raised birthing apprentices and official/ registered health care providers (Chary et al., 2012; Fehling et al., 2013; Gill et al., 2011; Lale et al., 2014; Rowan et al., 2011; Tlozek, E., 2016; MacDonald, 2022; Haruna, 2019). Since 2004, evidence suggests that strategic neglect of TBA training has adversely affected women and newborns, especially those with the least likelihood of access to SBAs (Gill et al., 2011; Lale et al., 2014; Rowan et al., 2011; Lane & Garrod, 2016). It is a basic human right that women and newborns have access to care during pregnancy and birth (United Nations Human Rights, 2020). Researchers and health leaders are now urging consideration for a specific role for TBAs in health care systems to improve maternal and newborn health outcomes in low-resource settings (Gill et al., 2011; Rowan et al., 2011; Lane & Garrod, 2016; Sibley et al., 2004; Haruna, 2019; MacDonald, 2022). Evidence regarding the role of TBAs in different global contexts, how to incorporate the role of TBAs into maternity health services and their remuneration remains unclear (Sibley et al., 2004; Sibley, et al., 2009). Consideration for TBA training is critical for low-resource countries struggling to train and retain sufficient SBAs and those experiencing resource-constrained infrastructure development hampering remote and rural access (Fotso et al., 2020; Kamblijambi & Holroyd, 2017; Kruske & Barclay, 2004; Sibley et al., 2014; MacDonald, 2022; Haruna, 2019). The State of the World's Midwifery Report (UNFPA, 2021) suggests there is a global shortfall of nine hundred thousand (900,000) midwives to serve the needs of childbearing communities, worse in low-resource countries which have suffered losses in their midwifery workforce during the Covid pandemic and other humanitarian disasters (Dey et al., 2024).

The Global Strategy for Women's, Children's, and Adolescents' Health Report 2016 – 2030 (WHO, 2016) identifies TBAs as an important community group for health authorities to engage with and strengthen overall health services. Despite strategic level departures from training and support for TBAs, the practice has continued in many countries by non-government organisations supporting marginalised populations but published data about these programs is lacking (Sibley et al., 2009, 2012).

Given the identified importance of TBAs in the contribution of improved perinatal outcomes in low-resource countries, and the emerging evidence around the role of TBAs, it is timely to review what is published regarding TBA training. The aim of this integrative review is to identify, synthesise and report on publications about TBA training in low-resource countries.

Method

Our aim was to report what is known about TBA training programs in low resource countries. An integrative literature review [ILR] gathers and synthesises the current state of knowledge around a specific phenomenon as a way of generating new knowledge and perspectives on a topic (Cronin & George, 2020). ILR reviews, critiques, and synthesises

the literature on a topic in an integrated way, that is, there is an integration of literature pertaining to the phenomenon from different communities of practice (Cronin & George, 2020). ILR is commonly used in healthcare reviews (Cronin & George, 2020; Whittemore and Knafl, 2005). In contrast, a scoping review seeks evidence in published academic research in a particular field to reveal knowledge gaps and determine a specific research question whereas a systematic review uncovers evidence about a specific topic in a comprehensive, systematic, and methodical manner which is replicable, to inform and guide clinical practice and future research (Cronin & George, 2020). An ILR was chosen as the most appropriate literature review process to understand the different perspectives of TBA training from a variety of communities of practice and evidence methodologies. The literature reporting on this topic included papers written by nursing and midwifery professionals, medical professionals, aid and development researchers and implementation scientists. To add rigor and reproducibility, a systematic five-staged process approach was chosen to define the key concepts, review the theories, and analyse the methodology of the research topic (Brennan, 1988; Whittemore and Knafl, 2005).

Stage 1: problem identification stage

The aim of this ILR was to report what is known about TBA training programs in low resource countries. The target population is TBAs – lay, community-based mostly women, who provide care and support to pregnant and birthing women, have learned their skills through apprentice-type, on the job learning passed on through generations of women (WHO, 1999).

Stage 2: literature search stage

A search strategy was developed, in consultation with a senior university librarian and three experienced qualitative research supervisors, incorporating relevant Boolean operators. The primary author independently searched all chosen databases in December 2020 and July 2024, including, Medline, Scopus, CINAHL and Google Scholar. Additional searches were conducted to find thesis dissertations via ProQ, Trove, Informit and the Curtin University library database. Literature from communities of practice who conduct their own systematic reviews of research provide an important source of knowledge for ILR, hence the inclusion of a systematic review conducted by the Cochrane database (Cronin & George, 2020). In total, 175 articles in English were identified and no gray literature was searched. The bibliographies of the final papers were reviewed for additional articles.

Key search terms included ‘Traditional Birth Attendant’, ‘training program’, and ‘developing countries’. ‘Traditional Birth Attendant’ offered a challenge as there are different names used globally such as: village birth attendant, traditional midwife, lay midwife, lady health worker, maternal and child health aides, and birth apprentice. When these additional terms were used in the search more articles became available. Some articles may not have been identified due to names other than TBA being used in publications.

Additional search terms included: training, education, curriculum, program evaluation, outcomes, low to middle income countries, resource-poor setting to ensure a wide-ranging capture of publications. Furthermore, searches using specific country names in the subject heading, for example Papua New Guinea [PNG], Guatemala, Sub Sahara Africa, illuminated more articles. Inclusion criteria were articles related to traditional birth attendant training programs in low resource settings from 2010. Exclusion criteria were articles reporting on skilled birth attendants, midwives, developed countries, and specific medical interventions using TBAs (such as HIV and TB prevention). A PRISMA flowchart of the records identified, included, excluded, and the reason for exclusion is presented in Fig. 1.

Selection Process: Two systematic reviews published in the Cochrane database reported research from 1989-2010 and identified a gap in

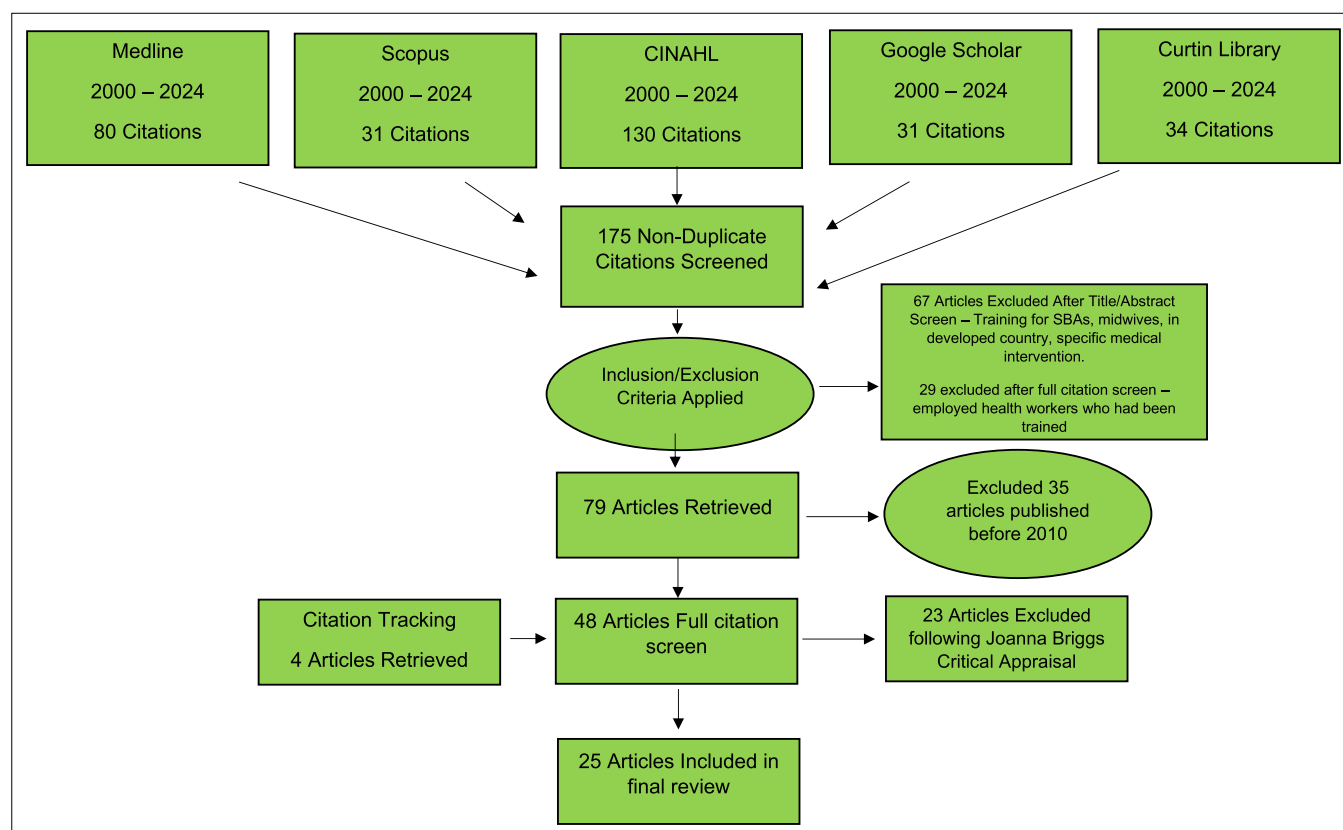


Fig. 1. ILR PRISMA flowchart.

knowledge about the specifics of a TBA training program (Sibley, Sipe & Barry, 2009; Sibley et al., 2012). Therefore, to address the aims of our ILR, publications from 2010 to 2024 were sought which brings a contemporary response to the search aim.

Stage 3: data evaluation stage

Forty-eight articles were uploaded to the EndNote® reference management program. Three academics with qualitative research and integrative review experience, independently assessed twelve papers each randomly assigned. The primary author reviewed all papers. A data extraction table was created (Table 1). The primary author collated all the reviewers' comments into a condensed format for discussion. Four additional papers were included during independent reading of publications, resulting in 48. The focus and findings of each paper in comparison to this review aim were discussed, and a decision made to include or exclude. Three studies lacked consensus, therefore the reviewer who had not read through those articles, made a final independent assessment and their decision was accepted. 25 papers were decided upon to be included in the final review.

Assessment of risk of bias in included studies

The Joanna Briggs evidence-based assessment tools were used to appraise the research (Lockwood et al., 2015). Articles were not excluded based on the quality appraisal; however, any limitations were acknowledged where relevant. Any discrepancies about the studies were discussed between the reviewers.

Stage 4: data analysis stage

Publications were analysed using the Whittemore and Knafl (2005) strategy for ILR with reviewer summaries presented in the ILR template to assist with decisions within a collaborative team (Table 1). The

authors independently reviewed all 25 papers, followed by group analysis and discussion until consensus of the themes and sub-themes was reached (Whittemore and Knafl, 2005). Four final themes with sub-themes were confirmed and are presented below (Fig. 2).

Stage 5: presentation of findings

TBAs tend to work and live in low-resource settings where there is minimal government investment to address maternal and newborn health system weaknesses, such as few to no SBAs and poor access to health services due to geographical challenges and lack of infrastructure. Table 1 identifies the countries represented in this review.

Theme 1: variance in the definitions for TBAs

Variance in definitions and roles associated with TBAs across communities and even countries present a challenge in implementing training programs.

Sub-theme 1: variance in role, scope, and title

There are different names for who is acknowledged by the WHO definition as a TBA. The scope of practice varies between countries with some TBAs working in partnership with formal health services to administer certain community education and medicines (Chary et al., 2012; Garcia et al., 2018; Hernandez et al., 2017; Talukder et al., 2017; Raams et al., 2018). Some TBAs provide education to their community and accompany women to a health facility for appointments and birth (Fehling et al., 2013; Gill et al., 2011; Nelson et al., 2012; Talukder et al., 2017). Others provide all basic care for childbearing women in the community, and in their homes (Nelson et al., 2012; Kamblijambi & Holroyd, 2017; Jones et al., 2015; Valley et al., 2016; Roberts & Anderson, 2017, 2021). In countries with well-resourced maternal and newborn health services, women are encouraged to birth in health

Table 1
Integrative review findings.

No	Author/Year/ Publication	Country/ TBA name	Aim	Publication Type	Data Collection Methods	Sample	Role of the TBA	Where TBAs provide service	Educational needs of TBAs	How we need to teach TBAs	Joanna Briggs Score
1	Chary et al., 2012 <i>Midwifery</i>	Guatemala/ Comadrona or lay midwife	Examine knowledge development & practice of indigenous midwives with focus on interaction with formal health services	Qualitative Descriptive	Participant observation In-depth interviews TBAs FGDs with Midwives	44 indigenous midwives (TBAs)	✓	✓	✓	✓	6 /10
2	Cooper Priest, 2012 <i>MSc Global Health Thesis Duke University</i>	Haiti/TBA	Are TBAs able to put into practise what they learn from a training program? Does the education model evaluate TBAs abilities?	Mixed Methods	Group Interviews Surveys Pre and post-test at 6 weeks and 6 months	17 TBAs	✓	✓	✓	✓	6/10
3	Dynes et al., 2012	Ethiopia/ Community Volunteer	Assess knowledge and skills transfer from 3 different levels of train the trainers	Qualitative Non-experimental, descriptive design	Pre- and post-Performance testing	626 TBAs 91 Health extension Workers	✓	✓	✓	✓	7/10
4	Fehling et al., 2013 <i>Public Health</i>	South Sudan/ Frontline Health Worker	Develop evidence based MNCH emergency training package	Qualitative	Multimodal needs assessment	33 frontline health workers (TBAs)	✓	✓	✓	✓	7/10
5	Nelson et al., 2012 <i>International Journal of Gynecology & Obstetrics</i>	South Sudan/ Frontline Health Worker	Develop, implement and evaluate evidence based TBA training package	Mixed methods	FGDs Surveys Multi-modal needs assessment Standard descriptive analysis	72 trainers 708 Frontline health workers 191 TBAs	✓	✓	✓	✓	6/8
6	Garcia et al., 2018 <i>Midwifery</i>	Guatemala/ Comadrona or lay midwife	Evaluate an oral TBA training program aimed at obstetric emergencies	Observational Study	Pre and post training checklist	11 TBA training schools				✓	5/9
7	Gill et al., 2011 <i>British Medical Journal</i>	Zambia/TBA	Determine whether a TBA training program can reduce perinatal mortality	Prospective, cluster randomised and controlled study	Intervention group – new training package incl. neonatal resus & antibiotic therapy for sick neonates. Control group – TBAs continue with basic care	127 TBAs 3497 village births	✓	✓		✓	11/13
8	Hernandez et al., 2018 <i>Healthcare</i>	Guatemala/ Comadrona or lay midwife	Assess impact of TBA prenatal care pre and post a training program	Qualitative	Prospective observational study in 2017	13 TBA participants 116 prenatal home visits	✓	✓		✓	7/10
9	Hernandez et al., 2017 <i>Frontiers in Public Health</i>	Guatemala/ Comadrona or lay midwife	Describe TBA training program	Discussion paper	Case Study		✓	✓		✓	6/8
10	Jones et al., 2015 <i>Midwifery</i>	Sierra Leone/ Maternal Child Health Aide	Evaluate teaching and learning within the Maternal Child Health [MCH] Aide	Qualitative	Structured direct observation of randomly selected training school	14 MCH training schools in 2013	✓	✓		✓	8/10

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Table 1 (continued)

No	Author/Year/ Publication	Country/ TBA name	Aim	Publication Type	Data Collection Methods	Sample	Role of the TBA	Where TBAs provide service	Educational needs of TBAs	How we need to teach TBAs	Joanna Briggs Score
11	Kamblijambi & Holroyd, 2017 <i>Midwifery</i>	Papua New Guinea/ Village Birth Attendant VBA	program – 2-year program Papua New Guinea midwives' perspectives of the effect of a targeted village birth attendant education programme	Sequential four-phase descriptive exploratory design	Semi structured interviews of nursing graduates' perspectives teaching TBAs in remote villages	16 Nurse interviews in remote PNG 2006 - 2009	✓	✓		✓	7/10
12	Kamblijambi, 2015 <i>PhD Thesis RMIT</i>	Papua New Guinea/ Village Birth Attendant VBA	Examining the effect of a targeted VBA Program in PNG - examined how knowledge & clinical skills transferred from MCH nursing students to VBAs and village child health workers (VCHWs), and then to rural women.	Thesis manuscript - Sequential four-phase descriptive exploratory design	Retrospective approach. 1 – curriculum mapping previous Uni curriculum 2- purposive sampling graduates from programs – 16 interviews 3- purposive sampling of VBAs and VCHWs trained by graduates - FGs 4-snow-balled sampling of rural PN women. VCHW – 10 interviews	3 FGDs with 6-7 participants each	✓	✓		✓	10/10
13	Ogura & Horiuchi, 2016 <i>Public Health Nursing</i>	Myanmar/ Women's Health Volunteer	Identified the relationship between interventions with women's health volunteer groups in two Myanmar villages and maternal and child health outcomes.	Mixed Methods	Cross-sectional design	Rural Myanmar 2 experimental villages 2 control villages 50 participants in each village	✓	✓			5/8
14	Raams et al., 2018 <i>Pregnancy and Childbirth</i>	21 LMICs	evaluate the effect, acceptance and safety of task shifting of specific aspects of AMTSL to unskilled birth attendants.	Systematic Review	5 databases using Cochrane Collaboration assessment tool	21 studies in LMICs Unskilled birth attendants	✓				11/11
15	Rowen, Prata & Passano, 2011 <i>Midwifery</i>	Bangladesh/ Community Volunteer	To demonstrate how a simple evaluation tool can provide a quantitative measure of knowledge acquisition and intended behaviour following a TBA training program.	Mixed Methods		45 TBAs attending 2 training sessions in rural setting	✓	✓		✓	8/8
16	Saravanan et al., 2011 <i>Midwifery</i>	India/TBA	Assess ways TBA training programs in India have been successful in	Qualitative	Structured questionnaires for trained and untrained TBAs	24 trained and 14 untrained TBAs in 16 villages. 25 mothers	✓	✓		✓	7/10

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Table 1 (continued)

No	Author/Year/ Publication	Country/ TBA name	Aim	Publication Type	Data Collection Methods	Sample	Role of the TBA	Where TBAs provide service	Educational needs of TBAs	How we need to teach TBAs	Joanna Briggs Score
17	Sibley et al., 2014 <i>Journal of Midwifery & Women's Health</i>	Ethiopia/ TBA	disseminating evidence-based knowledge on birthing practices Evaluate community and facility-based training program about birth and the early postnatal period	Mixed Methods	Baseline and endline surveys Pre & post- training assessment, perinatal verbal autopsy	3 regions in 2 rural Districts	✓	✓	✓	✓	8/8
18	Talukder et al., 2017 <i>Maternal & Child Nutrition</i>	Bangladesh/ Community Volunteer	Examine effects of training and post-training supervision on breastfeeding practices	Cluster random controlled trial	Baseline interviews of mothers, post 6 months of intervention survey and endline survey	1182 mothers interviewed	✓	✓			12/13
19	Vallely et al., 2016 <i>PNG Medical Journal</i>	Papua New Guinea/ Village Birth Attendant VBA	Describe situation of TBAs in PNG, the roles and functions of TBAs, the challenges facing both TBAs and those who provide their training and ongoing support.	Descriptive Qualitative	Semi-Structured interviews & FGDs		✓	✓	✓	✓	9/10
20	Fotso et al., 2020 <i>Int Journal of Public Health</i>	Sierra Leone/ Community Health Promoter	Evaluate the cost- effectiveness of rebranding TBAs to health promoters to increase referral to health facilities	Mixed Methods Quasi experimental design. Behaviour change intervention.	Baseline (795) & endline (1110) household survey Lives Saved Tool 3 groups – health promotion only, HP & business (income generation) group, comparison group	200 former TBAs rebranded as CHPs. 100 enrolled in income generation activities/ training	✓	✓		✓	8/9
21	Garcia, 2024 <i>Journal of Transcultural Nursing</i>	Guatemala/ Comadrona or lay midwife	Comadrona's response to obstetric emergencies. To understand what the TBAs want to know about obstetric emergencies to then co-design a training program for them	Qualitative design	Focus Group Discussions	17 urban Comadronas	✓	✓	✓	✓	99/10
22	Garcia & Kilanowski, 2020 <i>Journal of Transcultural Nursing</i>	Guatemala/ Comadrona or lay midwife	Explore lay midwives' knowledge, attitudes and practices regarding obstetric emergencies and complications	Descriptive ethnographical study	Focus group discussions	191 lay midwives	✓	✓	✓	✓	10/10

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Table 1 (continued)

No	Author/Year/ Publication	Country/ TBA name	Aim	Publication Type	Data Collection Methods	Sample	Role of the TBA	Where TBAs provide service	Educational needs of TBAs	How we need to teach TBAs	Joanna Briggs Score
23	Mateen, F 2024 <i>PhD thesis Georgetown University</i>	Kenya/ Community Health Promoters	Evaluate a one- day workshop for CHPs in rural Kenya. Assess knowledge about ANC, danger signs in pregnancy and referral	Quality Improvement project	Pre, post and 1- month later knowledge test	43 Community Health Promoters (CHPS)	✓	✓		✓	110/10
24	Roberts & Anderson, 2021 <i>Journal of Childbirth</i>	Guatemala/ Comadrona or lay midwife	Evaluate an enhanced TBA training program	Mixed methods	Needs assessment 8 TBAs Pre-test questionnaire Post test simulation competency	31 TBAs 60 hrs training 2 Trainers of Trainers	✓	✓	✓	✓	66/10
25	Roberts & Anderson, 2017 <i>Journal of Childbirth</i>	Guatemala/ Comadrona or lay midwife	Evaluate knowledge, skills and attitudes of TBAs following a 2-week simulation training program	Mixed Methods	Interviews with TBAs prior to training. Pre and post-test evaluations following training program	26 TBAs 14 different villages	✓	✓	✓	✓	77/10

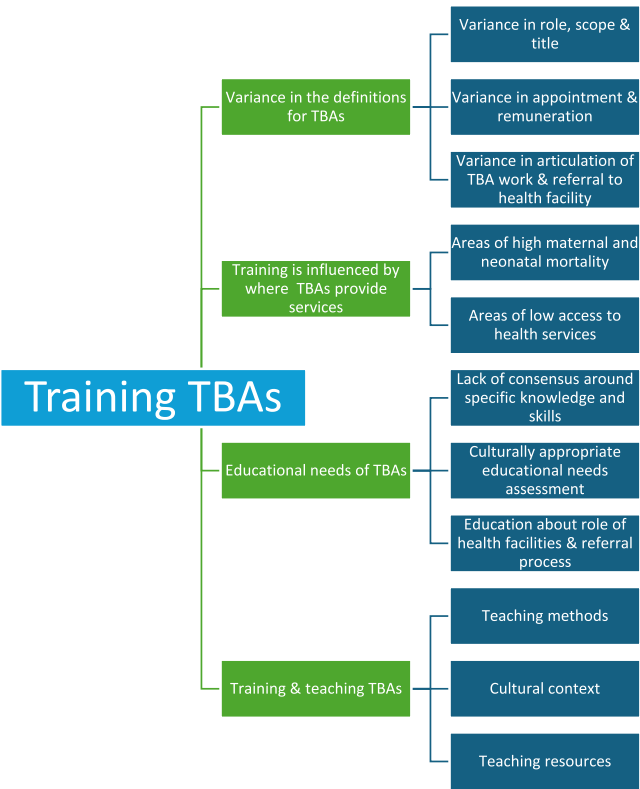


Fig. 2. Themes and sub-themes of ILR.

facilities under the supervision of a midwife or doctor and the focus of the TBA in these situations is on identifying danger signs in pregnancy, birth preparation especially for emergencies, and acting as a chaperone to give practical support and advocacy for the woman presenting to a

health facility (Mateen, 2024; Garcia & Kilanowski, 2020; Saravanan et al., 2011; Talukder et al., 2017; Sibley et al., 2014; Rowan et al., 2011; Roberts & Anderson, 2017, 2021). The role of some TBAs extends to public health education such as advising on the building of proper toilets for waste disposal, adding windows in houses for fresh air, building dish racks to store utensils, and keeping the environment clean to promote healthy living to eliminate preventable diseases (Kamblijambi, 2015; Mateen, 2024).

There are no clear guidelines on the scope of TBA practice possibly because names and roles vary across countries. Some studies noted that TBAs usually had low levels of literacy and numeracy proficiency with between one to three years primary school education, therefore it was deemed challenging for them to learn specific clinical skills such as how to take a blood pressure, perform a urinalysis or measure a fundal height (Gill et al., 2011; Jones et al., 2015; Ogura & Horiuchi, 2016; Raams et al., 2018).

Sub-theme 2: variance in appointment and remuneration

The review identified variance between countries and within provinces about the selection and remuneration of TBAs (Talukder et al., 2017; Saravanan et al., 2011; Cooper Priest, 2012; Chary et al., 2012; Roberts & Anderson, 2021). This discrepancy between those who may be paid or assume voluntary roles, who were appointed by cultural leaders or by formal health services, makes it challenging to mandate and standardise training. TBAs in Guatemala and PNG had strong self-motivation to attend training and serve their communities (Garcia & Kilanowski, 2020; Kamblijambi, 2015; Valley et al., 2016; Roberts & Anderson, 2017, 2021). Most authors commented it was important to provide food and refreshments to TBAs during the training as they had travelled long distances at their own expense to attend sessions (Cooper Priest, 2012; Nelson et al., 2012; Ogura & Horiuchi, 2016; Fotso et al., 2020).

Traditionally TBAs were selected by the communities they come from, through generations of women being ‘called’ to the service of helping women in pregnancy and childbirth, an apprentice-style passing

on of knowledge and experience (Garcia et al., 2018; Hernandez, 2017, 2018; Chary et al., 2012; Garcia, 2024; Garcia & Kilanowski, 2020; Roberts & Anderson, 2017, 2021). TBAs tend to have low levels of literacy and numeracy proficiency due to a lack of opportunity for education in the remote areas and rely on cultural knowledge passed down through generations of women, using traditional medicines and activities to support pregnancy and childbirth (Roberts & Anderson, 2017, 2021; Chary et al., 2012). Traditionally, they provide their service for free with the local family compensating the TBA for her time with practical gifts of food or other local necessities (Chary et al., 2012).

More recently, TBAs have been selected by government and/or non-government health agencies in countries where communities are attempting to close the gap in service provision for remote areas (Roberts & Anderson, 2017, 2021; Fotso et al., 2020). These TBAs tend to practice traditional approaches mixed with biomedical knowledge as they have access to some training and are given a small financial incentive (Fehling et al., 2013; Kamblijambi & Holroyd, 2017; Garcia et al., 2018; Mateen, 2024; Fotso et al., 2020; Garcia, 2024; Garcia & Kilanowski, 2020; Hernandez et al., 2017, 2018; Ogura & Horiuchi, 2016; Roberts & Anderson, 2017, 2021). Some countries have introduced incentives for TBAs when they bring women to the health facilities for care but there have been reports of this being abused with fraudulent claims, fighting between registered and unregistered TBAs and competition between TBAs for the financial reward (Saravanan et al., 2011; Raams et al., 2018). A recent publication reported on a trial in Kenya whereby TBAs were given health promotion training and an opportunity to start up a small enterprise (Fotso et al., 2020).

Sub-theme 3: variance in articulation of TBA work and referral to health facility

All publications reviewed identified that TBAs should be incorporated into mainstream health services to fill the gap in remote areas where resources and infrastructure such as roads, health facilities and fully qualified SBAs are insufficient. Partnerships between community and health services is strongly advocated (Fotso et al., 2020; Sibley et al., 2014; Garcia et al., 2018; Roberts & Anderson, 2021; Raams et al., 2018). TBAs have a role in supporting and incorporating traditional practices with mainstream midwifery care and the contribution of TBA practices to overall maternal and newborn care remains very much undervalued by government health authorities (Raams et al., 2018; Garcia et al., 2018; Fotso et al., 2020; Garcia, 2024; Garcia & Kilanowski, 2020; Roberts & Anderson, 2017, 2021).

The process of skilled health workers training TBAs provides a cascade of training which can improve trust and confidence in the health system in remote low-income communities and increase referrals to hospital because the community understand when and why to refer (Roberts & Anderson, 2017; Fotso et al., 2020; Mateen, 2024; Garcia, 2024; Fehling et al., 2013; Nelson et al., 2012; Kamblijambi & Holroyd, 2017). Trust, respect, and improved collaboration between paid health workers and TBAs could increase with training, which in turn helps strengthen health systems (Roberts & Anderson, 2017; Chary et al., 2012; Fotso et al., 2020; Mateen, 2024).

For decades, the relationship between TBAs and local health authorities has been marred with conflict due to a culture of blame from healthcare staff towards TBAs (Hernandez, 2017; Garcia, 2024; Roberts & Anderson, 2017). However, several authors advocate for two-way communication between TBAs and health facility staff, supervision, and ongoing training as necessary elements for strengthening overall health services (Chary et al., 2012; Rowan et al., 2011; Sibley et al., 2014; Mateen, 2024; Garcia, 2024; Garcia & Kilanowski, 2020; Roberts & Anderson, 2017, 2021).

Theme 2: training is influenced by where TBAs provide services

Predominantly, TBAs service low-resource communities that have a high MMR and Neonatal Mortality Rate [NMR].

Sub-theme 1: areas of high maternal and neonatal mortality

All studies were conducted in countries with high MMR and NMR. Settings included remote areas where health facilities were unable to meet needs of the community due to a lack of infrastructure, poor quality of services, insufficient and/or inadequately trained health workers (Roberts & Anderson, 2017, 2021; Fehling et al., 2013; Kamblijambi & Holroyd, 2017; Cooper Priest, 2012; Fotso et al., 2020). Due to the inadequate education of TBAs, evidence highlights that they are often unfairly blamed for the high MMR and NMR in low resource countries, whereas it is more likely due to a lack of access to skilled services in the remote areas (Sibley et al., 2014; Hernandez et al., 2018).

Sub-theme 2: areas of low access to health services

In all studies, TBAs were in countries where 70-85% of populations lived in rural or remote areas. Disparity in health outcomes between rural and urban areas is highlighted in publications (Roberts & Anderson, 2017, 2021; Ogura & Horiuchi, 2016). For example, in Myanmar, 75% of people live in rural parts, but only 1.3% of total government spending is on rural healthcare (Ogura & Horiuchi, 2016). Poverty impacts the care of pregnant women from rural and remote areas as they are unable to afford the costs associated with transport, food, accommodation, hospital and medication fees (Fehling et al., 2013; Gill et al., 2011; Nelson et al., 2012; Fotso et al., 2020).

TBAs are commonly found in areas where there is an absence of SBAs who choose not to reside in remote areas because of a lack of continuing professional development and poorly stocked and supported facilities (Kamblijambi, 2015; Chary et al., 2012). In addition, living conditions are challenging and inadequate for their families specifically due to lack of schools for their children, power, clean running water, or telecommunications (Kamblijambi, 2015; Valley et al., 2016).

In PNG, it was reported that when a TBA training program was discontinued, TBAs continued to support women, often without ongoing supervision or formal support from the health system or community and without continued access to essential equipment such as soap, gloves, and clean umbilical cord ties (Kamblijambi, 2015; Kamblijambi & Holroyd, 2017; Valley et al., 2016). TBAs provide essential care, but report feeling overlooked and neglected, because their mission to serve the community and God are predominant influencing factors (Roberts & Anderson, 2017, 2021; Valley et al., 2016; Chary et al., 2012). Some describe their work as dangerous due to the risk of blame in the event of an adverse outcome but continue to serve their communities because they know it is important for the survival of women and newborns (Garcia, 2024; Garcia & Kilanowski, 2020; Roberts & Anderson, 2017, 2021).

Theme 3: educational needs of TBAs

There is no standard, evidence-based global training program for TBAs (Sibley et al., 2014). The lack of consensus about the educational needs of TBAs is compounded by confusion about their name, role, scope, and place of practice. The literature strongly advocates the need for training and support of community-based providers of care and support to pregnant and birthing women. To be effective it must be culturally appropriate and applicable to local contexts and resources.

Sub-theme 1: lack of consensus around specific knowledge and skills

Programs for TBAs have been adapted from WHO guidelines or training programs used in different settings specifically designed for SBAs. Examples include the International Confederation of Midwives [ICM] *Essential Competencies for Midwives*, WHO *Essential Care of the Newborn* guidelines, Hesperian publication, *A Book for Midwives*, Laerdal Global Health training programs: *Helping Babies Breathe* and *Helping Mothers Survive*, *Home-Based Life Saving Skills* training program by American College of Nurse Midwives, and *Community Health Education*

program (Chary et al., 2012; Garcia et al., 2018; Hernandez et al., 2017, 2018; Fehling et al., 2013; Roberts & Anderson, 2017, 2021). TBA abilities are often underestimated, and TBAs and volunteer community health promoters have demonstrated knowledge and skills acquisition above that of the qualified health workers (Roberts & Anderson, 2017; Fehling et al., 2013; Sibley et al., 2014; Ogura & Horiuchi, 2016). When evidence-based medical information was provided in a culturally appropriate manner, in their own language, TBAs were highly likely to accept the information and change their behaviours, especially with information that challenged local myths and health beliefs usually ascribed as sorcery (Fehling et al., 2013; Kamblijambi, 2015; Talukder et al., 2017; Fotso et al., 2020; Roberts & Anderson, 2017).

Sub-theme 2: culturally appropriate educational needs assessment

The root cause for ineffective TBA training programs is that these are poorly designed and not culturally appropriate (Chary et al., 2012; Sibley et al., 2014). TBAs tend to be found in areas where cultural traditions remain strong and there is a divide between modern ways of being and traditional practices, such as gender roles exclusively aligned to marriage, childbearing and home keeping for women and girls (Cooper Priest, 2012; Kamblijambi, 2015). These communities are also marginalised for several reasons including being an Indigenous minority, geographical isolation or strong ethnic traditions (Chary et al., 2012; Fehling et al., 2013; Garcia et al., 2018; Hernandez et al., 2017, 2018; Kamblijambi, 2015; Mateen, 2024; Roberts & Anderson, 2017, 2021). Integration of local knowledge is important in developing and facilitating a TBA training program and including older women is an important deferential cultural consideration (Talukder et al., 2017; Saravanan et al., 2011; Rowan et al., 2011).

Responding to questions from the TBAs in a respectful way and in the context of local practice enhances learning and understanding (Roberts & Anderson, 2017; Chary et al., 2012). Simplifying training to focus on important basic skills and information that are known to save lives is key to the successful first steps of any training program for TBAs (Talukder et al., 2017; Saravanan et al., 2011; Garcia & Kilanowski, 2020; Roberts & Anderson, 2017, 2021).

Sub-theme 3: education about role of health facilities and referral process

In some communities TBAs are only communicators and educators. TBAs can positively influence the dissemination of knowledge and information about maternal and newborn health including the need to seek antenatal, intrapartum, and postnatal care in a timely manner (Kamblijambi & Holroyd, 2017; Garcia et al., 2018; Hernandez, 2017, 2018; Ogura & Horiuchi, 2016; Fotso et al., 2020; Garcia, 2024; Roberts & Anderson, 2017, 2021). A common focus for education is training TBAs about life saving measures – identifying or anticipating danger signs and referring pregnant women early to a health facility, considering local physical and cultural conditions such as delays in transport, money, support and lack of skilled health workers at the receiving facility (Fehling et al., 2013; Hernandez et al., 2018; Cooper Priest, 2012; Nelson et al., 2012; Fotso et al., 2020; Garcia & Kilanowski, 2020; Jones et al., 2015; Roberts & Anderson, 2017, 2021). Hand washing, use of a clean blade for cutting the umbilical cord, immediate breastfeeding and weighing of babies were all practical skills that improved following TBA trainings (Talukder et al., 2017; Saravanan et al., 2011; Fotso et al., 2020; Roberts & Anderson, 2017, 2021).

TBAs who participate in training become confident educators and birth attendants in whom their community has improved trust and engagement (Sibley et al., 2014; Roberts & Anderson, 2017, 2021). Education about the danger signs in women and newborns particularly in the postnatal period were commonly referred to as an area of importance to prevent early neonatal death and poor outcomes following birth (Fehling et al., 2013; Hernandez, et al., 2018; Fotso et al., 2020; Roberts & Anderson, 2017, 2021). However, a knowledge

gap is noted about care of the mother and baby in the first 48hrs following birth (Fotso et al., 2020; Fehling et al., 2013; Mateen, 2024).

Theme 4: Training and Teaching TBAs

Sub-theme 1: teaching methods

Most programs reported didactic delivery as the predominant method for teaching, where the teacher (in a position of power) is at the front of the class lecturing to learners (Raams et al., 2018; Jones et al., 2015; Gill et al., 2011). The work of Roberts and Anderson (2017, 2021) reports on statistically significant improvements in knowledge, skills and attitudes of TBAs in Guatemala where active-learning techniques such as role plays, and hands-on practice were incorporated into programs. Few online teaching or training resources were available or accessible in LMICs due to the lack of information and telecommunications infrastructure (Kamblijambi, 2015; Sibley et al., 2014). In addition, teaching classrooms or facilities were usually small, cramped, and unsuitable for skills-based demonstration and learning (Nelson et al., 2012; Jones et al., 2015).

Some TBAs provide specific basic clinical care such as assistance during labour and birth, essential newborn care, umbilical cord care, neonatal resuscitation, and administration of life-saving medication such as *Misoprostol* to prevent postpartum haemorrhage (Fehling et al., 2013; Nelson et al., 2012; Valley et al., 2016). Some studies reported that TBAs can have difficulty learning skills that required a higher degree of fine motor control such as taking a blood pressure reading, checking the foetal heart rate, and assessing urine using a dipstick. Conversely, five studies from Guatemala reported improved practical skills around clamping and cutting the umbilical cord, measuring the fundal height using a tape measure, and identifying foetal position through abdominal palpation. (Fehling et al., 2013; Cooper Priest, 2012; Saravanan et al., 2011; Roberts & Anderson, 2017, 2021). Several authors advocated that basic clinical skills must be practiced under the guidance of a facilitator or preceptor with adequate time allocated to practising and refining the skills to ensure a level of competency (Hernandez, et al., 2018; Jones et al., 2015; Kamblijambi, 2015; Saravanan et al., 2011; Roberts & Anderson, 2017, 2021).

Training course length varied considerably from one day workshops to 6 months of intensive classes. TBAs preferred shorter courses (5 days long) because it suited their family and other community responsibilities and was respectful to the fact that they were volunteers (Nelson et al., 2012). Mateen (2024) reported that a one-day workshop focussed on antenatal care, danger signs and referral pathways was helpful in improving TBA knowledge and skills in rural Kenya but recommended sustained education sessions.

Sub-theme 2: cultural context

Engaging with the community to understand the educational needs and approaches is an important step to ensure that the training is strategic, respectful and sustainable (Chary et al., 2012; Sibley et al., 2014; Garcia, 2024; Roberts & Anderson, 2017, 2021). Providing training in the local language using appropriate visual aids that reflect the respective culture are more readily accepted (Sibley et al., 2014; Garcia, 2024; Garcia & Kilanowski, 2020). In a study in Guatemala, using the native tribal language for training a remote minority group of TBAs was received positively. The TBAs reported that hearing the training in their own language made a significant difference to their understanding and ability to apply knowledge (Garcia et al., 2018; Chary et al., 2012). Historically, TBAs were informed by the oral tradition of storytelling and similar training for TBAs with low levels of literacy and numeracy proficiency, in remote settings, is recommended (Chary et al., 2012; Roberts & Anderson, 2017).

In areas of high MMR and NMR it is important to incorporate TBAs into the health system through task shifting, such as utilising TBAs to deliver basic antenatal care such as advice on nutrition during pregnancy and the dispersion of prenatal vitamins that would otherwise not

be provided in remote, low resource settings (Chary et al., 2012; Fehling et al., 2013; Roberts & Anderson, 2017; Vallely et al., 2016; Fotso et al., 2020; Mateen, 2024; Gill et al., 2011). This ensures closing the gap between remote communities and health services. Uterine massage or postpartum tonus assessment was safe to teach TBAs, but controlled cord traction is a skill not recommended for task shifting (Hernandez, et al., 2018). Overall, the literature acknowledged that careful task shifting of specific educational roles from midwives, nurses, or doctors to TBAs would help to strengthen overall maternity care, but finding the right trainers for this strategy can be challenging. This acknowledgement demonstrates TBA training that improves basic knowledge, enabling identification and referral for skilled clinical care of women with complications of pregnancy and labour is valuable in the strategic aim of combating preventable deaths of women and newborns (Fotso et al., 2020; Roberts & Anderson, 2017, 2021; Nelson et al., 2012; Mateen, 2024; Garcia, 2024).

Sub-theme 3: teaching resources

A clear outline of the knowledge and skills to be learned must be communicated, and several programs had specific checklists or competencies for assessment purposes which were often pictorial (Fehling et al., 2013; Sibley et al., 2014; Nelson et al., 2012; Fotso et al., 2020; Roberts & Anderson, 2017, 2021). Patience and adequate time need to be allocated to assessing retention and application of knowledge related to skill competence (Roberts & Anderson, 2017, 2021). Retention of knowledge was found to be greatest in learning practical skills rather than in curricula which focused solely on theoretical knowledge (Cooper Priest, 2012; Garcia et al., 2018; Roberts & Anderson, 2017, 2021).

Five studies identified that in-class teaching coupled with practical assessment of competency followed by regular supervision in the field was important (Roberts & Anderson, 2017, 2021; Fotso et al., 2020; Garcia & Kilanowski, 2020; Mateen, 2024). Training strategies using song, dance, storytelling, pictorial cards, or flipcharts, role-playing and/or using an anatomical model were all identified as helping TBAs understand and transfer knowledge into practice (Fotso et al., 2020; Fehling et al., 2013; Nelson et al., 2012; Roberts & Anderson, 2017, 2021). A preceptor was recommended to support learning and assist the transference of knowledge into practice, as well as having trainers and preceptors remain in the community which enhanced supervision and support (Fehling et al., 2013; Cooper Priest, 2012). See Table 2 for a list of clinical skills and educational information commonly referred to in the literature for suggested inclusion in training programs for TBAs.

Studies from Africa, South America and PNG highlighted negative outcomes of training programs using resources too advanced for TBAs with low levels of literacy and numeracy proficiency (Kamblijambi, 2015; Roberts & Anderson, 2017; Jones et al., 2015). A lack of appropriate anatomical models, flipcharts and diagrams can hamper learning, including resources not appropriate for the setting such as videos or online programs which are not accessible in remote areas without power

and technology (Jones et al., 2015; Sibley et al., 2004; Kamblijambi, 2015). Conversely, TBAs' knowledge and practice before and after an appropriately planned training program showed statistically significant improvements about managing simple care of pregnant women and newborns in the community (Mateen, 2024; Rowan et al., 2011; Roberts & Anderson, 2017, 2021). Pictorial training resources particularly enhanced knowledge retention in these contexts (Fehling et al., 2013; Rowan et al., 2011; Roberts & Anderson, 2017, 2021).

Discussion

This literature review reported on what is known about training programs for TBAs in low resource settings in LMICs and identified that TBAs are an important stakeholder in maternal and newborn health care systems, especially in remote communities where access to formal healthcare is challenging. The review identified that TBAs bridge a gap between communities and formal healthcare services; they can assist communities to overcome barriers such as cultural differences, geographical distances, and financial constraints which compound disadvantage in low resource settings. Successful TBA training content, teaching methods and resources to address the issues of disadvantage, were identified in the review.

Bridging the gap: TBAs bridge the gap not able to be filled by SBAs or others from formal health facilities in low resource settings. TBAs carry the burden of care for pregnant and birthing women although they have limited education, supervision and support from formal healthcare services or trained health workers. The communities where TBAs tend to serve are predominantly marginalised, and isolated from formal maternity healthcare services whether due to cultural differences and oppression or geographical challenges. As the community-based supporters of birth in remote, poor settings, TBAs deserve recognition for the role they play in recognising and referring complicated cases to health facilities and need to be supervised and supported by local health workers. Consensus on a standardised name for TBAs, and clear articulation of their role and scope of practice is key to successful integration of TBAs into overall maternal and newborn care in low resource settings.

Successful TBA training programs: Effective TBA training programs included modules on reproductive anatomy, signs and symptoms of pregnancy, normal pregnancy and foetal development, danger signs of pregnancy, supportive care during birth, immediate essential care of the newborn, initiation of early breastfeeding, emergency care for excessive bleeding after birth and referral to health facilities (Fehling et al., 2013; Kamblijambi & Holroyd, 2017; Sibley et al., 2014; Garcia et al., 2018; Hernandez, et al., 2018; Fotso et al., 2020; Garcia & Kilanowski, 2020; Roberts & Anderson, 2017, 2021). Successful training programs should be integrated into existing healthcare systems, where skills continue to be developed with the support from preceptors and community-based trainers on a monthly or bimonthly basis, and where TBAs are provided with essential supplies such as basic clean birth kits and

Table 2
List of evidence-based TBA training topics.

REPRODUCTIVE HEALTH	ANTENATAL	INTRAPARTUM	POSTPARTUM	NEONATAL
Identify female reproductive & sexual organs Family planning Methods Signs & symptoms of early pregnancy Nutrition	Healthy pregnancy Nutrition in pregnancy Birth preparedness and importance of antenatal care visits Referral to health facility for birth with a SBA Danger signs in pregnancy Emergency birth planning	Danger signs in labour and birth Use of clean birth kit Essential care of the newborn Heavy bleeding after birth Management of third stage of labour using Misoprostol & uterine massage Use of intrauterine balloon tamponade	Monitoring mother following birth -bleeding, vaginal trauma, signs of fever, breast care. Breastfeeding – WHO guidelines Counselling – breast care, nutrition (especially fluids), personal hygiene, rest and recovery, uterine massage, danger signs Newborn care Mother & baby check at health facility	Immediate care of the newborn – dry, stimulate, keep warm, delay cord clamping), check colour, activity, and feeding. Newborn resuscitation - use of bulb syringe, bag, and mask. Counselling – promotion of early, exclusive BF, kangaroo mother care for sick or small babies, hygiene, cord care. Danger signs in the newborn for referral Diarrhoeal illnesses in children, malnutrition, pneumonia illnesses

resuscitation equipment (Hernandez et al., 2017; Garcia & Kilanowski, 2020; Mateen, 2024; Roberts & Anderson, 2017, 2021).

TBA training needs to be culturally and linguistically appropriate to increase transference of knowledge into practice, with a combination of traditional and biomedical information acceptable to the TBAs and the local community. Practical life-saving skills appropriate for the level of education of the TBAs needs to be included as well as general community public health promotion and counselling skills which contribute to overall health behaviour change and well-being. As most TBAs have low literacy and numeracy proficiency levels, training needs to have a high level of interactivity, such as incorporating songs, dance, role-playing, images, and drama.

Discussion about whether the TBAs were employed, paid a stipend or how they were supported beyond training was mentioned in recent publications (Fotso et al., 2020; Garcia, 2024; Garcia & Kilanowski, 2020; Mateen, 2024). There was limited discussion about how to assess retention and understanding of information, including assessing competence of basic skills and sustainable knowledge transference into practice, with some authors acknowledging the gap (Hernandez et al., 2017; Nelson et al., 2012; Roberts & Anderson, 2017, 2021). What the TBAs already know, what they need to know and then how to target training to fill the gap is still not clear. TBAs who underwent training programs reported increased job satisfaction, were more motivated to continue improving their knowledge and skills, and had improved knowledge, skills, and attitudes about maternal and newborn health care (Sibley et al., 2014; Hernandez, 2017; Garcia, 2024; Roberts & Anderson, 2017, 2021).

Strategic decisions to divert resourcing of TBA programs has resulted in lower numbers of trained TBAs and limited structural supports such as preceptorship. To enable the vital linking work that TBAs fulfil, it is essential to reignite investment in TBA training and support. Intentional integration and inclusion of TBAs as a key referral mechanism for women who are very remote or otherwise unserved is critical to improving perinatal morbidity and mortality in low resource settings.

Study strengths and limitations

Strengths of this review are related to the comprehensive search of numerous databases. The search strategy and PRISMA provided, support the reproducibility of this work. Limitations are related to inclusion of only recent articles published in the last fourteen years and in English. Additionally, no gray literature was reviewed which excluded non-peer-reviewed publications and reports produced by non-government agencies.

Conclusion

This literature review provides a synthesis of evidence regarding what is known about TBA training programs in low resource settings in LMICs. Findings support that effective TBA training should be integrated into maternal and newborn health systems to link communities to formal health facilities, provide supervision and support to TBAs and to help overcome cultural and geographical barriers to care. TBAs clearly play a role in the broader ecosystem of maternity care and are currently an under-recognised and under-utilised cadre. Addressing TBA training is a key strategy to enhance and enable TBAs to contribute to integrated, systems-wide approaches to improving maternal and newborn care.

CRedit authorship contribution statement

Sara David: Formal analysis, Writing – review & editing, Writing – original draft, Methodology, Investigation, Conceptualization, Data curation. **Zoe Bradfield:** Supervision, Formal analysis, Writing – review & editing, Conceptualization. **Yvonne Hauck:** Writing – review & editing, Supervision. **Michelle A Kelly:** Supervision, Writing – review & editing, Formal analysis.

Declaration of competing interest

The authors 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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References

- Brennan, M., 1988. Training traditional birth attendants reduces maternal mortality and morbidity. *Trop. J. Obstet. Gynaecol.* 1 (1), 44–47. Retrieved from. <https://search.proquest.com/docview/78022933?accountid=10382>.
- Chary, A., Diaz, A., Henderson, B., Rohloff, P., 2012. The changing role of indigenous lay midwives in Guatemala: new frameworks for analysis. *Midwifery* 29, 852–858. <https://doi.org/10.1016/j.midw.2012.08.011>, 2013.
- Cooper Priest, M. (2012). *Traditional Birth Attendant education in Fondwa, Haiti*. Department of Global Health, Duke University. Retrieved from: <https://familyhealthministries.org/wp-content/uploads/MarnieCooperPriestthesisJuly2012.pdf>.
- Cronin, M.A., George, E., 2020. The why and how of the integrative review. *Organ. Res. Methods* 26 (1), 168–192. <https://doi.org/10.1177/1094428120935507>.
- Dey, T., Shah, M.G., Bab, A., Mugo, N., Thommesen, T., Vivilaki, V., Boniol, M., Alam, N., Dibley, M., Okoro, D., Tenhoope-bender, P., Triantafyllou, T., Langlois, E.V., 2024. Reproductive, maternal, newborn, child and adolescent health services in humanitarian and fragile settings: a mixed methods study of midwives' and women's experiences. *PLOS Glob. Public Health* 4 (7), 1–19. <https://doi.org/10.1371/journal.pgph.0003384>.
- Dynes, M., Buffington, S., Carpenter, M., Handley, A., Kelley, M., Tadesse, L., Beyene, H., Sibley, L., 2012. Strengthening maternal and newborn health in rural Ethiopia: early results from frontline health worker community maternal and newborn health training. *Midwifery* 29, 251–259. <https://doi.org/10.1016/j.midw.2012.01.006>, 2013.
- Fehling, M., Nelson, B.D., Ahn, R., Eckardt, M., Tiernan, M., Purcell, G., El-Bashir, A., Burke, T.F., 2013. Development of a community-based maternal, newborn and child emergency training package in South Sudan. *Public Health* 127, 797–805. <https://doi.org/10.1016/j.puhe.2013.01.010>, 2013.
- Fotso, J.C., Ambrose, A., Hutchinson, P., Ali, D., 2020. Improving maternal and newborn care: cost-effectiveness of an innovation to rebrand traditional birth attendants in Sierra Leone. *Int. J. Public Health* 65, 1603–1612. <https://doi.org/10.1007/s00038-020-01487-z> (0123456789(),-volV)(0123456789(),-volV).
- Garcia, K., Dowling, D., Mettler, G., 2018. Teaching Guatemalan traditional birth attendants about obstetrical emergencies. *Midwifery* 61, 36–38. <https://doi.org/10.1016/j.midw.2018.02.012>, 2018.
- Garcia, K., 2024. San Raymundo: focus group about Comadronas' response to obstetrical emergencies in urban Guatemala. *J. Transcult. Nurs.* 1–7. <https://doi.org/10.1177/10436596241253864>.
- Garcia, K., Kilanowski, J.F., 2020. Senales de Peligo: guatemalan lay midwives' perceptions of responding to obstetrical complications. *J. Transcult. Nurs.* 31 (6), 547–553. <https://doi.org/10.1177/1043659619889114>.
- Gill, C., Phiri-Mazala, G., Guerina, N.G., Kasimba, J., Mulenga, C., MacLeod, W.B., Waitolo, N., Knapp, A.B., Mirochnick, M., Mazimba, A., Fox, M.P., Sabin, L., Seidenberg, P., Simon, J.L., Hamer, D.H., 2011. Effect of training traditional birth attendants on neonatal mortality (Lufwanyama neonatal survival project): randomised controlled study. *Br. Med. J.* 342–346. <https://doi.org/10.1136/bmj.d346>.
- Haruna, U., Kansanga, M.M., Bagah, D.A., 2019. Repositioning traditional birth attendants to provide improved maternal healthcare services in rural Ghana. *Int. J. Health Plan. Manag.* 34, 987–994. <https://doi.org/10.1002/hpm.2779>.
- Hernandez, S., Oliveira, J., Jones, L., Chumil, J., Shirazian, T., 2018. Impact of standardized prenatal clinical training for traditional birth attendants in rural Guatemala. *Healthcare* 6 (60), 1–10. <https://doi.org/10.3390/healthcare6020060>.
- Hernandez, S., Oliveira, J.B., Shirazian, T., 2017. How a training program is transforming the role of traditional birth attendants from cultural practitioners to unique health-care providers: a community case study in rural Guatemala. *Front. Public Health* 5 (111). <https://doi.org/10.3389/fpubh.2017.00111>.
- Janti, N., 2020. Midwives and dukun beranak, the choices for handling childbirth. *Lembaran Sej.* 16 (2), 165–182. <https://doi.org/10.22146/lembaran-sejarah.66957>.
- Jones, S., Ameh, C., Gopalakrishnan, S., Sam, B., Bull, F., Labicane, R., Dabo, F., van den Broek, N., 2015. Building capacity for skilled birth attendance: an evaluation of the maternal and child health aides training programme in Sierra Leone. *Midwifery* 31 (2015), 1186–1192. <https://doi.org/10.1016/j.midw.2015.09.011>.
- Kamblijambi, J. (2015). A maternal and child health program outcome evaluation study: examining the effect of a targeted village birth attendant program in Papua New Guinea. Submitted in fulfilment of the requirements for the degree of Doctor of Philosophy School of Health Sciences College of Science Engineering and Health RMIT University.

- Kamblijambi, J.K., Holroyd, E., 2017. Papua New Guinea midwives' perspectives of the effect of a targeted village birth attendant education program. *Midwifery* 52, 11–18. <https://doi.org/10.1016/j.midw.2017.04.007>, 2017.
- Kruske, S., Barclay, L., 2004. Effect of shifting policies on traditional birth attendant training. *J. Midwifery Women's Health* 49 (4), 306–311. <https://online.library.wiley.com/doi/pdf/10.1016/j.jmwh.2004.01.0>.
- Lale, S., Chou, D., Gemmill, A., Tuncalp, O., Moller, A.B., Daniels, J., Gulmezoglu, A.M., Temmerman, M., Alkema, L., 2014. Global causes of maternal death: a WHO systematic analysis. *Lancet Glob. Health* 2, 323–333. [https://doi.org/10.1016/S2214-109X\(14\)70227-X](https://doi.org/10.1016/S2214-109X(14)70227-X).
- Lane, K., Garrod, J., 2016. The return of the traditional birth attendant. *J. Glob. Health* 6 (2), 1–5. <https://doi.org/10.7189/jogh.06.020302>.
- Lockwood, C., Munn, Z., Porritt, K., 2015. Qualitative research synthesis: methodological guidance for systematic reviewers utilizing meta-aggregation. *Int. J. Evid. Based Healthc.* 13 (3), 179–187. <https://doi.org/10.1097/XEB.000000000000062>.
- MacDonald, M., Wallace, J.L., 2022. Anthropologies of global maternal and reproductive health. *Global Maternal and Child Health*. https://doi.org/10.1007/978-3-030-84514-8_6.
- Mateen, F. (2024). *Health education project to increase Kenyan community health promoters' knowledge of antenatal care and danger signs in pregnancy*. Submitted in fulfilment of the requirements for the degree of Doctor of Philosophy at Graduate School of Nursing, Georgetown University. https://repository.library.georgetown.edu/bitstream/handle/10822/1088683/Mateen_georgetown_0076D_15966.pdf?sequence=1&isAllowed=y.
- Musie, M.R., Mulaudzi, F.M., 2024. Knowledge and attitudes of midwives towards collaboration with traditional birth attendants for maternal and neonatal healthcare services in rural communities in South Africa. *Midwifery* 130, 103925. <https://doi.org/10.1016/j.midw.2024.103925>.
- Musie, M.R., Mulaudzi, F.M., Anokwuru, R., Sepeng, N.V., 2022. An inclusive framework for collaboration between midwives and traditional birth attendants and optimising maternal and child healthcare in restricted rural communities in South Africa: policy considerations. *Healthcare* 12, 363. <https://doi.org/10.3390/healthcare12030363>.
- Mwoma, T., Kituku, J., Gitome, J., Kahumbi, N., Ndegwa, P., Maina, M., Bagelman, J., 2021. Role of traditional birth attendants in providing pre and postnatal care to mothers in refugee camps: a case of Ifo camp dadab Kenya. *Int. J. Pregnancy Child Birth* 7 (3), 58–62. <https://doi.org/10.15406/ipcb.2021.07.00229>.
- Nacht, A., Rivera, C., Montes, S.B., Zambrano, A.J., Lamb, M., Bolanos, A., Asturias, E., Berman, S., Heinrichs, G., Harrison, M., 2022. The addition of traditional birth attendant care to a home-based skilled nursing program in rural Guatemala: a secondary analysis from a quality improvement database. *J. Midwifery Women's Health* 67, 107–113. <https://doi.org/10.1111/jmwh.13307>.
- Nelson, B., Ahn, R., Fehling, M., Eckardt, M., Conn, K., El-Bashir, A., Tiernan, M., Purcell, G., Burke, T., 2012. Evaluation of a novel training package among frontline maternal, newborn, and child health workers in South Sudan. *Int. J. Gynecol. Obstet.* 119, 130–135. <https://doi.org/10.1016/j.ijgo.2012.05.019>, 2012.
- Ogura, M., Horiuchi, S., 2016. A cross-sectional study of community-based maternal and child health interventions involving women's health volunteer groups in rural Myanmar. *Public Health Nurs.* 33 (5), 449–459. <https://doi.org/10.1111/phn.12275>.
- Raams, T., Browne, J., Festen-Schrier, V., Klipstein-Grobusch, K., Rijken, M., 2018. Task shifting in active management of the third stage of labor: a systematic review. *BMC Pregnancy Childbirth* 18 (1), 47. <https://doi.org/10.1186/s12884-018-1677-5>.
- Roberts, L.R., Anderson, B.A., 2017. Simulation learning among low literacy Guatemalan traditional birth attendants. *Int. J. Childbirth* 7 (1). <https://doi.org/10.1891/2156-5287.7.2.67>.
- Roberts, L.R., Anderson, B.A., 2021. Enhancing traditional birth attendant training in Guatemala. *Int. J. Childbirth* 11 (1), 27–36. <https://doi.org/10.1891/IJCBIRTH-D-20-00028>.
- Rowen, T., Prata, N., Passano, P., 2011. Evaluation of a traditional birth attendant training programme in Bangladesh. *Midwifery* 27 (2), 229–236. <https://doi.org/10.1016/j.midw.2009.06.003>.
- Saravanan, S., Turrell, G., Johnson, H., Fraser, J., Patterson, M., 2011. Re-examining authoritative knowledge in the design and content of a TBA training in India. *Midwifery* 28, 120–130. <https://doi.org/10.1016/j.midw.2011.04.006>, 2012.
- Sarmiento, I., Paredes-Solis, S., de Jesus, Garcia, A., Paulino, N.M., de los Santos, F.R.S., Legorreta-Soberanos, J., Zuluaga, G., Cockcroft, A., Andersson, N., 2022. Safe birth in cultural safety in southern Mexico: a pragmatic non-inferiority cluster-randomised controlled trial. *BMC Pregnancy Birth* 22, 43. <https://doi.org/10.1186/s12884-021-04344-w>.
- Shukla, V.V., Carlo, W.A., 2022. Risk prediction for stillbirth and neonatal mortality in low-resource settings. *Newborn* 1 (2), 215–218. <https://doi.org/10.5005/jp-journals-11002-0034>.
- Sibley, L.M., Sipe, T.A., Barry, D., 2012. Traditional birth attendant training for improving health behaviours and pregnancy outcomes. *Cochrane Database Syst. Rev.* 8. <https://doi.org/10.1002/14651858.CD005460.pub3>.
- Sibley, L., Tesfaye, S., Desta, B., Frew, A.H., Kebede, A., Mohammed, H., Ethier-Stover, K., Dynes, M., Barry, D., Hepburn, K., Gobeze, A., 2014. Improving maternal and newborn health care delivery in rural Amhara and Oromiya regions of Ethiopia through the maternal and newborn health in Ethiopia partnership. *J. Midwifery Women's Health* 59 (1), 6–20. <https://doi.org/10.1111/jmwh.12147>.
- Sibley, L.M., Sipe, T.A., Koblinsky, M., 2004. Does traditional birth attendant training increase use of antenatal care? A review of the evidence. *J. Midwifery Women's Health* 49 (4), 298–305. <https://doi.org/10.1016/j.jmwh.2004.03.009>.
- Sibley, L.M., Sipe, T.A., Brown, C.M., Diallo, M.M., McNatt, K., Habarta, N., 2009. Traditional birth attendant training for improving health behaviours and pregnancy outcomes (review). *Cochrane Database Syst. Rev.* 2007 (3). <https://doi.org/10.1002/14651858.CD005460.pub2>.
- Talukder, S., Farhana, D., Vitta, B., Greiner, T., 2017. In a rural area of Bangladesh, traditional birth attendant training improved early infant feeding practices: a pragmatic cluster randomized trial. *Matern. Child Nutr.*, 13, 1–11. <https://doi.org/10.1111/mcn.12237>, 2017.
- Tlozek, E., 2016. PNG to effectively ban home births in bid to reduce high maternal, infant mortality rates. *World Today*. Retrieved from. <https://www.abc.net.au/news/2016>.
- UNFPA, ICM and WHO. (2021). The state of the world's midwifery report 2021. <https://www.unfpa.org/publications/sowmy-2021>.
- United Nations Human Rights [UNHR]. (2020). *Information series on sexual and reproductive health and rights: maternal mortality and morbidity*. https://www.ohchr.org/Documents/Issues/Women/WRGS/SexualHealth/INFO_MMM_WEB.pdf.
- Vallley, L., Paul, R., Naidi, B., Morewaya, G., Kariwiga, G., Vallley, A., Morgan, C., Homer, C., 2016. I have a heart to help the mothers'': 25 years of the village birth attendant program in Milne Bay province, Papua New Guinea. *PNG Med. J.* 59 (3–4), 164–177. Retrieved from. <https://www.pngimr.org.pg/wp-content/uploads/2019/04/VOL-59-NO-3-4-SEPTEMBER-DECEMBER-2016.pdf>.
- Whittemore, R., Knafl, K., 2005. The integrative review: updated methodology. *Methodol. Issues Nurs. Res.* 52 (5), 546–553. <https://doi.org/10.1111/j.1365-2648.2005.03621.x>.
- WHO. (1999). *Reduction of maternal mortality: a joint WHO/UNFPA/UNICEF World Bank statement*. https://apps.who.int/iris/bitstream/handle/10665/42191/9241561955_eng.pdf.
- WHO. (2016). *Global strategy for women's, children's and adolescents' health report 2016–2030*. <https://www.who.int/life-course/partners/global-strategy/globalstrategyreport2016-2030-lowres.pdf>.
- WHO. (2019). *Trends in maternal mortality 2000 to 2017: estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division*. <https://www.who.int/publications/i/item/9789241516488>.
- WHO. (2023). *Maternal mortality*. <https://www.who.int/news-room/fact-sheets/detail/maternal-mortality>.