Maternal and Child Health in South Asia: A Review of Community Health Education and Awareness Interventions

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Disclaimer

This paper represents the research findings of a Masters level student. The Australian Himalayan Foundation has chosen to publish this research to contribute to the body of knowledge available in maternal and child health, both in the international community development sector and in Nepal. This paper is not meant to represent the position or opinions of the Australian Himalayan Foundation or the University of Sydney. Any errors are the fault of the authors.

Contents

Overview

Introduction

As part of my Master of Global Health's capstone unit, for a few months in 2020 I worked as an intern at the Australian Himalayan Foundation (AHF). Since 2017, AHF has been implementing the 'Nurses for Nepal' project in two wards located in a mountainous district of eastern Nepal. This report aims to review performance indicators and effectiveness of other maternal and child health focused community health education and awareness interventions conducted in rural and remote settings in Nepal and neighbouring countries. The results from this comparison, together with the evaluation results of the 'Nurses for Nepal' project currently being conducted, will be used to provide recommendations for future health programming between AHF and its local partner, Action for Nepal (AF Nepal).

The Australian Himalayan Foundation

Formed in 2002, the Australian Himalayan Foundation (AHF) is a registered Australian non-governmental organisation (NGO) which works towards improving the quality of life of the local people living in the Himalaya region across Nepal, Bhutan and Northern India, through programs in health, education and environment conservation (1). Since 2017, AHF has been implementing the 'Nurses for Nepal' project in partnership with the local organisation, AF Nepal.

Nurses for Nepal Project

To address the pressing health needs of the local people, AHF together with its local implementing partner, AF Nepal, conducted a health needs assessment in 2017 in two wards, Chheskam and Waku, located in the Solukhumbu district of eastern Nepal (2, 3). For these communities living in the mountain regions of Nepal, the geographical landscape poses a significant challenge in delivering health services (4). Together with several demand and supply side barriers to health service utilisation such as the lack of health infrastructure and medicines, cultural constraints, poverty and lack of health knowledge, the interaction of these factors has a significant negative effect on the health outcomes of the local populations, leading to a higher risk of morbidity and mortality.

The health needs assessments revealed that the highest priority problems as expressed by the local people included female reproductive health issues, lack of health infrastructure and awareness, and lack of skilled health personnel such as skilled birth attendants (SBA). The most common health problems seen across the two wards include pneumonia and diarrhoea in children, uterine prolapse and side-effects from using contraceptive devices in women of reproductive age, and oral health problems in the older population. As there were no birthing centres in either ward, pregnant women were referred to other health centres. However, due to cost and distance, local women often resorted to having home births and therefore increase their risk of developing complications. These assessment results became the basis on which AHF and AF Nepal established the 'Nurses for Nepal' (N4N) project, aiming to address both supply and demand side barriers to improve the health of the people living in Chheskam and Waku, with a major focus on maternal and child health.

As part of the project, two nurses were recruited, trained and stationed at each of the health posts in the two wards to assist the existing health staff, run regular health awareness programs in schools and support the Female Community Health Volunteers (FCHVs) to run the mothers' groups. To ensure sustainability, the program provided training to the local community Health Post Management Committee (HPMC) in order to strengthen their

capacity so they could manage the health posts effectively. The three-year project was implemented from September 2017 and ended in August 2021, with some follow-on activities being undertaken in the few months after, due to them being postponed because of COVID-19.

In order to assess the main changes generated by the project and the extent to which measured results can be attributed to the project, as well as to inform future project development, an evaluation commenced in January 2021. After consultation with external experts who have extensive experience working in health program implementation, it has been suggested that the future AHF health program may focus on improving health knowledge and awareness in the remote communities of Solukhumbu. For this reason, AHF was interested to partner with the University of Sydney for an intern to conduct research on other similar health education programs and to identify their performance indicators and the lessons learned.

Nepal

Nepal is a low-income country located in South Asia with a population of approximately 28.6 million people (5). The country is divided into three ecological zones: mountain, hill and *Terai* (plains) (Figure 1), and is also extremely ethnically diverse with 103 distinct ethnic/caste groups speaking 125 different languages (6).

Figure 1. Map of Nepal showing the 3 ecological zones (7)

Nepal has made significant progress in improving key maternal and child health indicators (Table 1). Maternal mortality ratio (MMR) has declined from 850 per 100 000 live births in 1991 to 258 in 2015 (8, 9). Under-five mortality declined from 162 per 1000 live births in 1991 to 34 in 2017 and the neonatal mortality rate (NMR) declined from 50 per 1000 live births in 1996 to 21 in 2017 (8, 9). Data from the 2016 Nepal Demographic and Health Survey (2016 NDHS) also shows that 69% of women attended at least four antenatal care (ANC) visits, 57% of women receiving postnatal care (PNC) within two days of childbirth and 58% of births were attended by skilled health personnel (10). However, these proportions differ between women living in either urban or rural areas, with rural women less likely to receive these services than their urban counterparts.

Table 1. Summary of Nepal's progress on key maternal and child health indicators

	Maternal mortality ratio (per 100 000 live births)	Under-five mortality rate (per 1000 live births)	Neonatal mortality rate (per 1000 live births)
1991	850	162	50
2015-2017	258	34	21
SDG target 2030	70	25	12

The increase in total health expenditure per capita, financial aid from the donor community and the implementation of several key health policies and programs have been instrumental in improving maternal, newborn and child health in Nepal (8). Recognising safe motherhood as a national priority, the government formulated the National Safe Motherhood policy in 1998 which eventually evolved into the current Safe Motherhood and Newborn Health Long Term Plan (2006-2017). To address the health workforce shortage, the government introduced strategies such as the National Policy on Skilled Birth Attendants (SBAs) in 2006 to increase the numbers of and access to SBAs and developed a workforce of over 50 000 female community health volunteers (FCHV) since the 1980s. In 2009, the *Aama* Programme was introduced, which provides free delivery care in a health facility, cash incentives to access ANC and PNC, cash payments to cover transport costs and funding for health facilities.

However, continued effort is needed if Nepal hopes to achieve the Sustainable Development Goal (SDG) targets of reducing MMR to less than 70 per 100 000 live births, under-five mortality to at least as low as 25 per 1000 live births, and NMR to at least as low as 12 per 1000 live births, all by 2030 (9). The issue of inequality in health care access and outcomes between socioeconomic and geographical groups will also need to be addressed to achieve SDG Target 3.7 of ensuring universal access to sexual and reproductive health care services.

Health System Barriers

A review by Karkee et al. (2013) analysed 21 different studies to identify the various barriers preventing women from utilising maternal health services in Nepal (11). The barriers identified by the review were grouped into 4 categories: sociocultural factors; perceived need/benefit of skilled attendance; physical accessibility; and economic accessibility. Sociocultural factors include age, ethnicity, traditional beliefs, mother's or husband's educational levels and women's status. A woman's perception of the need and benefit of delivering in a health facility attended by skilled health personnel was influenced by factors such as knowledge of pregnancy risks, previous experiences at health facilities and attending antenatal visits. For the proportion of the population living in remote and mountainous regions, long distances to health facilities and lack of transport makes seeking maternal care difficult. Lastly, with 53% of the rural population belonging to the two lowest wealth quintiles, the cost of transportation and the potential opportunity costs associated with lost wages can negatively affect a woman's ability to seek out care (10, 11).

To gain an understanding of the various health system barriers affecting perinatal health faced by the population living in the mountain villages of Nepal, a qualitative study by Paudel et al. (2018) was conducted in two villages in the Mugu district (12). Located in the mid-western region of Nepal, the district of Mugu lies in the remote mountainous zone and is ranked the lowest on the Human Development Index among all districts in the country. Data from the interviews revealed common themes related to health service delivery, the quality of care and local health governance. A common issue raised by the female participants was the fear of, and mistreatment from health providers at the health facilities, especially during childbirth, leading to women preferring home births. Other concerns raised by the study participants included lack of distinction between doctors and support staff, the view that healthcare was simply just health workers prescribing pills, lack of engagement from health workers to educate and counsel patients, home and community visits were rarely conducted by local health workers despite national policy stating that this was one of their main roles, and lastly, several health system failures such as poor implementation of

national policies, health worker absenteeism, and corruption, due to poor health governance and lack of accountability.

Additionally, interviews revealed that policy recommendations in terms of care for newborn babies were not common practice amongst the women in the study villages (12). National policy recommends that after birth, newborn babies should be immediately clothed and bathing should be postponed for at least 24 hours to prevent hypothermia (13). However, newborn babies were commonly bathed immediately after birth in cold water for aesthetic reasons and to initiate crying. Having clothes for newborns was deemed by the locals to be only appropriate for when they were older. Since health facility practices are in line with policy recommendations, this conflict in what the local women deemed as appropriate care for their newborn was a factor in their preference of delivering at home. Breastfeeding immediately after birth is also recommended by national policy, but women in the study villages commonly delayed breastfeeding until after they had delivered and discarded the placenta and bathed the newborn. In addition, there was a misconception among the village women that the first breast milk (colostrum) was harmful to newborn babies. Despite the government having put in place a number of policy recommendations, there seems to be an issue of implementation due to the lack of consideration of the local cultural context and lack of training of health staff to local cultural practices.

Research Overview

Research Methodology

The research conducted focused on reviewing literature drawn from academic database searches. Studies selected for review were those centred on maternal and child health awareness/education interventions and conducted in rural or remote communities in Nepal and neighbouring countries such as India and Bhutan. Data extracted from these studies included setting and population, intervention description, indicators used, successes/strengths, weaknesses/limitations, and quality. Searches for maternal and child health awareness/education interventions implemented by NGOs were also conducted. NGOs doing similar work to AHF were contacted and invited for discussion.

Research Outcomes

12 studies were identified from database searches and are included in this report. 7 studies involved facilitated women's groups, 4 involved health worker led education sessions and 1 involved community singing sessions. Out of the 12 studies, only 6 used outcome indicators related to maternal and child health knowledge (Table 2). The remaining 6 studies used various outcome indicators such as NMR, MMR, uptake of ANC and delivery services, home-care practices and healthcare seeking behaviour (Table 3).

Table 2. Summary of maternal and child health awareness/education interventions using knowledge outcome indicators

Author(s)	Study Design	Intervention (Frequency)	Primary Outcome Indicator/s	Sample	Location (Year)
Sharma et al. (2018) (14)	Cluster-randomised controlled trial	Singing sessions (Total of 80 singing sessions performed)	Knowledge of antenatal care, importance of rest and diet, planning for delivery, and the value of SBAs	n = 1572	Nepal (2016)
Shrestha et al. (2016) (15)	Randomised controlled trial	Health worker led education sessions (One 10-15 min session prior to discharge & one postpartum follow-up telephone support)	Maternal knowledge of neonatal care, maternal confidence & postpartum maternal anxiety	n = 143	Nepal (2016)
Younes et al. (2015) (16)	Cluster-randomised controlled trial	Facilitator led women's groups (Monthly meetings)	Mother's under-5 health related knowledge	n = 51755	Bangladesh (2005 – 2011)
Singh et al. (2018) (17)	Quasi-experimental design	Peer facilitator interactions	Child nutrition knowledge, maternal nutrition knowledge, child nutrition practices & maternal nutrition practices	n = 1890	Nepal (2014 – 2015)
Dhital et al. (2019) (18)	Uncontrolled before-and-after-study	Facilitator led women's groups (Monthly meetings. Also made follow-up visits)	Knowledge of maternal and neonatal danger signs	n = 377	Nepal (2016 – 2018)
Darmstadt et al. (2010) (19)	Cluster-randomised controlled trial	Health worker home visits (2 prenatal visits & 4 postnatal visits)	Knowledge of maternal and neonatal danger signs	n = 21140	Bangladesh (2004 – 2006)

Table 3. Summary of maternal and child health awareness/education interventions not using knowledge outcome indicators

Author(s)	Study Design	Intervention (Frequency)	Primary Outcome Indicator/s	Sample	Location (Year)
Azad et al. (2010) (20)	Cluster-randomised controlled trial	Facilitator led women's groups (Monthly meetings)	NMR	n = 503163	Bangladesh (2005 – 2007)
Bhutta et al. (2011) (21)	Cluster-randomised effectiveness trial	Health worker led women's groups (Held on quarterly basis, HW also did home visits)	NMR	n = 51409	Pakistan (2006 – 2008)
Tripathy et al. (2010) (22)	Cluster-randomised controlled trial	Facilitator led women's groups (Monthly meetings)	NMR	n = 228186	India (2005 – 2008)
Choulagai et al. (2017) (23)	Cluster-randomised controlled trial	Facilitator led women's groups	Skilled birth care utilisation	n = 3844	Nepal (2013 – 2014)
Thapa et al. (2019) (24)	Non-randomised, cluster-controlled trial	Health worker led education sessions (4 two-hour sessions)	Completion of at least 4 ANC visits	n = 114	Nepal (2015 – present)
Manandhar et al. (2004) (25)	Cluster-randomised controlled trial	Facilitator led women's groups (Monthly meetings)	NMR	n = 28931	Nepal (2001 – 2003)

Results

Knowledge and Awareness

All studies which used knowledge related outcome indicators reported significant improvements in maternal and child health knowledge among their study participants (14-19). Sharma et al. (2018) focused on 5 key health issues - importance of antenatal visits, need for supplementary diet, rest during pregnancy, planning for childbirth, and use of SBAs. These issues were promoted by song and dance, performed by local people. The study showed that test scores almost doubled in the intervention group (14). When the data was disaggregated according to education level and gender, the greatest increase in knowledge scores were seen in the illiterate group of both women and men. Furthermore, the mean scores remained similar between post-intervention and the 12 month-follow up surveys. Younes et al.'s (2015) women's group intervention resulted in significant improvements to knowledge of hygienic practices such as hand washing with soap before food preparation, exclusive breast feeding, preparation of diarrhoea treatment and of at least 3 ways to prevent diarrhoea and worms (16). Singh et al.'s (2018) study focused on improving knowledge related to maternal and child nutrition (17). A significant increase was seen in only 1 of the knowledge indicators – knowing that fruits and vegetables were good for children – whereas the increases in knowledge related to exclusive breastfeeding and maternal nutrition were found to be not significant. Lastly, both Dhital et al. (2019) and Darmstadt et al. (2010) reported that study participants' knowledge of maternal and neonatal danger signs significantly improved post intervention (18, 19).

Homecare Practices

Despite the positive results in the improvement of knowledge and awareness, the effects of maternal and child health awareness/education interventions on home care practices have been mixed amongst the studies selected for review. One study found a significant increase in women giving colostrum, breastfeeding within 30 minutes after birth and delaying bathing of newborns (21). The use of song to communicate health messages by Sharma et al. (2018) led to participants reporting that they were more likely to provide additional food and rest

for pregnant women, and planned for childbirth (14). Results from Darmstadt et al.'s (2010) study, showed that delayed bathing, early breastfeeding and immediate drying and wrapping of newborns significantly increased in the intervention group (19). In contrast, the study by Manandhar et al. (2004) resulted in no difference in delayed wrapping of newborns, early bathing or breastfeeding between the intervention and control groups (25). Although higher numbers of participants in the intervention group of the Azad et al. (2010) study reported delaying bathing and exclusive breastfeeding, it was not significant compared to the control group (20).

Healthcare Seeking Behaviour

In addition to possible changes in home care practices, several of the studies examined whether the interventions had any influence on health care seeking behaviour among their study participants, particularly in seeking ANC services and choosing to deliver in a health facility. Manandhar et al. (2004) reported that women from intervention clusters were more likely to have sought out any antenatal care and delivered in a health facility with a government health provider or worker such as a doctor, nurse or midwife (25). Similar results were found in Dhital et al. 's (2019) study showing that mothers were significantly more likely to attend a minimum of four ANC visits and deliver in a health facility (18). Women attending at least one ANC visit significantly increased in Choulagai et al. 's (2017) study however, attendance of four or more ANC visits and use of skilled birth care did not. (23). Findings from both Bhutta et al. (2011) and Thapa et al. (2019) were similar in that both studies did not observe any significant difference in the attendance of ANC services or delivery in a health facility between the intervention and control groups (21, 24).

Neonatal Mortality Rate

Of the 12 studies selected for review, 5 looked at the effects their interventions had on NMR with 3 studies reporting a significant reduction in NMR (21, 22, 25). Tripathy et al. (2010) and Manandhar et al. (2004) observed a reduction in NMR by 32% and 30% respectively, with Bhutta et al. (2011) reporting a smaller yet significant reduction. Azad et al. (2010) and

Darmstadt et al. (2010) however, both found no difference in NMR between their intervention and the control groups (19, 20).

Maternal Mortality Ratio

Lastly, only 2 out of the 12 selected studies reported the effects maternal and child health awareness/education interventions had on MMR. Results from the Manandhar et al. (2004) study showed that their intervention reduced MMR by 80% (25). In contrast, results from the Tripathy et al. (2010) study showed that although MMR was generally lower in the intervention group, it was not significantly different to that of the control group (22).

Key Lessons Learnt/Recommendations

Involve Family Members

The majority of the studies included in this report involved interventions targeting women, with only one study reporting that a small percentage of men also attended the women's group meetings (16). Azad et al. (2010) identified that gender-based barriers such as having to ask husbands for permission, may have played a role in preventing women from joining group meetings or seeking care (20). Women in Nepal generally have a low social status which negatively affects their power to make decisions regarding their own health and the allocation of household resources such as money (26, 27). Involving male partners in maternal and child health interventions therefore has gained attention since research suggests that men have an important role in safeguarding maternal health since they hold greater power in health related decision making, and allocating household resources to pay for health care costs. However, studies have identified common barriers which prevent male partner's involvement such as gaps in knowledge levels in recognising pregnancy and delivery danger signs, societal sigma, cultural beliefs such as postpartum seclusion, and gender roles (26, 27). Activities related to pregnancy, delivery and newborn care are generally perceived by men to be the exclusive domain of women (27). When they are

involved during childbirth, male partners take on a supportive role such as preparing food and providing financially rather than a direct hands-on role. It is also important to note that, traditionally, a woman will go on to live with her husband's family after marriage where the mother-in-law is considered to be in the top position in the household. The mother-in-law therefore is mainly responsible for the decision making regarding maternal health care and is directly involved during childbirth. Including mothers-in-law and other female family members such as sisters-in-laws in education and awareness interventions may also prove beneficial in improving maternal and child health outcomes. Depending on how comfortable the women are with discussing maternal health issues in front of their partners, interventions should target the sexes separately. Only when deemed appropriate should interventions involve educating couples together.

Longer or Repeated Interventions

A concern which was raised in a few of the selected studies was that the interventions may need to be repeated more frequently or conducted over a longer timeframe to influence behaviour change. All of Singh et al. (2018), Choulagai et al. (2017) and Thapa et al.'s (2019) interventions lasted for only 12 months, which the authors believe may explain their modest results (17, 23, 24). Unfortunately, there is a lack of data to support a set length of time needed for interventions to be able to bring about a significant change to behaviour related to maternal and child health. It has been suggested that interventions over a 2 to 4 year period leads to only modest changes in behaviour and that a period of 3 to 5 years is required for health interventions to show significant impact (28). Singh et al. (2018) also observed that the frequency of contact with a peer facilitator (PF) influenced the success of the intervention (17). They found that although exposure to any number of PF contact was able to increase maternal nutrition knowledge, only those who had contact with a PF two or more times had increased child nutrition knowledge. In the Thapa et al. (2019) study, the only key knowledge area the intervention was able to improve was about pregnancy danger signs (24). The authors believe that this was due to the topic of pregnancy danger signs being discussed more frequently than other topics during the group sessions.

Include a Larger Proportion of Pregnant Women

Results from 3 of the selected studies shows that the proportion of pregnant women participating in the intervention women's groups is associated with the reduction of NMR (20, 22, 25). Both the Tripathy et al. (2010) and Manandhar et al. (2004) interventions had high coverage of pregnant women participating in women's groups (22, 25). In Manandhar et al.'s (2004) study, 37% of pregnant women in the intervention clusters attended the groups whereas in Tripathy et al.'s (2010) study, coverage was 18% in the trial's first year and rose to 55% in year 3. Both studies reported a reduction in NMR by 30% and 32% respectively. Only 3% of pregnant women in the intervention clusters attended the women's groups in the Azad et al. (2010) study where no significant difference on NMR was reported post-intervention (20).

Design Culturally Considered Interventions

The success of Sharma et al.'s (2018) study at improving health knowledge especially for those with low educational levels demonstrates the potential of interventions which have been designed and implemented using a culturally appropriate approach (14). Using the knowledge that singing and dancing plays an important role in daily rural life in Nepal, the authors used traditional music as a medium to communicate health messages. Pictures of local gods were also printed on wall charts displaying the key messages of the songs and distributed to all households as a strategy to stress the importance of the messages and reduce the likelihood of the charts being discarded. Given that Nepal is an extremely ethnically diverse country, interventions should be tailored to the specific cultural context of the study population to maximise the potential impact of raising knowledge and awareness of maternal and child health. Culturally sensitive interventions have the possibility of shifting cultural norms and therefore have a greater impact on long-term behaviour change.

Adding Service-Side Interventions

In the studies which reported no changes to attendance of ANC services, delivery in a health facility post-intervention, or MMR, the authors attribute these results to service-side issues

such as poor quality of care, and the lack of health infrastructure and human resources (21, 23, 24). The increase in women attending at least one ANC visit in Choulagai et al.'s (2017) study may have resulted from attending the women's group sessions, but no differences were found for the attendance of four or more ANC visits and the use of skilled birth care, which may have been related to service-side issues and also to issues related to distance and lack of transportation (23). Therefore, adding service-side interventions alongside demand-side intervention may help to improve healthcare seeking behaviour.

Limitations

A major limitation of this report was the exclusive review of only academic studies and not including studies conducted by NGOs. Different levels of financial resources and varying capacities of NGO staff means that their approach to program implementation differs to that of academic studies. The results and lessons learned from these NGO studies would be valuable for AHF to refer to so that AHF does not waste donor dollars in interventions that have already been proven not to work and use the recommendations suggested for future project design. Similar maternal and child health awareness/education interventions by other NGOs were identified, and correspondence was sent to invite them for discussion. Unfortunately, a response was not received in time and therefore their studies could not be included in this report.

Conclusion

The results presented in this report support the benefits of women's education group interventions in improving maternal, newborn and child health knowledge and awareness, and reducing the neonatal mortality rate. Women post-intervention were more likely to understand the importance of ANC, exclusive breastfeeding, delivering in the presence of a SBA and recognising pregnancy and delivery danger signs. Despite the positive results in the improvement of knowledge and awareness, the effects of maternal and child health awareness/education interventions on home care practices, health seeking behaviour and maternal mortality ratio have been mixed amongst the studies selected for review. Based on the lessons learned from the review, the following recommendations are put forward to AHF for future health programming:

(i)   interventions should be designed and tailored to the specific cultural context of the study population to maximise the potential impact on improving health knowledge and behaviour change

(ii)   include men and other women family members such as mothers-in-laws and sisters-in-laws partners in the interventions

(iii)   interventions to be implemented for a period of 3 to 5 years

(iv)   ensure that a large proportion of pregnant women of the study population attend the education groups

(v)   the required frequency and total number of education groups attended to show a significant benefit needs to be established prior to scale-up

(vi)   adding service-side interventions addressing the quality of health services, the lack of health infrastructure and human resources to improve healthcare seeking behaviour

This will ensure that future programs implemented by AHF are effective, influence long-term behaviour changes and improve maternal, newborn and child health outcomes and the quality of life for those local people living in the Himalaya region across Nepal, Bhutan, and Northern India.

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Appendix A - Summary of Maternal and Child Health Education/Awareness Interventions

Sharma BB, Loxton DJ, Murray H, Angeli GL, Oldmeadow C, Chiu S, et al. A first step to improving maternal mortality in a low-literacy setting; the successful use of singing to improve knowledge regarding antenatal care. American journal of obstetrics and gynecology. 2018;219(6):615.e1-.e11.

Project Design	- Parbat District – 4 rural VDCs - Intervention cluster – Chitre (1740) & Ramja Deurali (1779) - Control cluster – Mudikuwa (1869) & Falebas Khanigaun (1925) - Two clusters were geographically separated by major geological features making communication between the two unlikely - Specialist obstetric advice was sought to identify key health messages to be transmitting 5 issues were chosen to be focused on – importance of antenatal visits, need for supplementary diet, rest during pregnancy, planning for childbirth, and use of SBAs - Pre- and post-intervention surveys (1 pre and 2 post) - The 6 best songs were chosen via a competition at a community festival - Chitre intervention progression was conducted July 14-23, 2016 - Ramja Deurali conducted Aug 5-12, 2016 - A total of 80 singing sessions were organised – estimated that 68.2% of the total cluster population heard the health messages - Each household was also given a wall chart which illustrated the key health messages of the songs – chart incorporated pictures of local gods to encourage villagers to value messages and preserve the wall chart
Outcome Indicators	- Primary outcome was knowledge of antenatal care, importance of rest and diet, planning for delivery, and the value of SBAs - Secondary outcome was evidence of behaviour change linked to the messages within the songs
Results	Knowledge scores were assessed as the number of correct items out of 36 questions

	• A total of n=1572 (intervention 768 and control 804) participants at baseline and n=1510 (intervention 735 and control 775) at post intervention completed the survey
	• The intervention was associated with a significant test score increment in the intervention group
	• Knowledge of antenatal care, importance of rest and diet & planning for delivery improved
	• The total knowledge score in the intervention group nearly doubled from 11.6 to 22.33 out of 36.
	• There was almost no change in the control group
	• The greatest improvement in knowledge was observed among the illiterate cohort
	• Improvement in the knowledge among males and females was similar with no gender-specific pattern of change
	• Mean scores at post intervention and 12 month-follow up were similar
	• Participants who found the songs helpful were more likely to indicate they provided additional food, rest and planned properly for a birth
	• 63.9% indicated that they provided information learned in the intervention to their neighbours and friends
	• 41.3% of participants indicated they were still singing the songs from the program
Strengths	• Intervention involved facilitating the community to take the leading role
	• Published data suggest that the more the interventions are designed and constructed with consideration given to local culture, the greater the likelihood of success in long-term behavioural change
	• Exposing almost all members of the community to new ideas on the management of pregnancy at the same time may have generated a new cultural norm within the community leading to the preservation of the new knowledge over the 12-month period
	• The 12-month follow-up data indicates a sustained intervention effect
	• The intervention was low cost since they used local resources
Weaknesses	• Intervention not designed to detect changes in maternal mortality
	• Although there was no loss of knowledge at 12-month follow up, it is unknown how long the acquired knowledge will be retained and whether it will translate into altered maternal health outcomes
	• The intervention and control group turned out to be not completely comparable, with a difference in knowledge pre intervention

Shrestha S, Adachi K, Petrini MA, Shrestha S, Rana Khagi B. Development and evaluation of a newborn care education programme in primiparous mothers in Nepal. Midwifery. 2016;42:21-8.

Project Design	- Study design – randomised controlled trial design - Participants were recruited from a primary maternity and women's hospital located in Kathmandu, Nepal - Intervention n = 69 - Control n = 74 - The development of the structured educational programme was based on the WHO (2010) guideline for essential newborn care course, the Save the Children 'Care of the Newborn' reference manual, an extensive review of the literature, and information about mothers' gaps in knowledge - Control group received routine general newborn care education from on-duty nurses before discharge - Intervention group received the same routine general newborn care education but also undertook a structured educational programme before discharge that was based on adult learning theory
Outcome Indicators	Primary outcomes – maternal knowledge of neonatal care, maternal confidence & postpartum maternal anxiety
Results	- There were no statistically significant differences between the intervention and control groups on baseline measure of the outcome variables: maternal knowledge, anxiety & confidence - Statistical significant differences were found in the intervention group's pretest and posttest scores on maternal knowledge of newborn care, confidence, & anxiety - The number of infants taken to the health centre due to some illness was significantly different between the intervention and control groups
Strengths	Randomised controlled trial design
Weaknesses	- Small sample size with only primiparous mothers - Short intervention duration - Sample including only hospital births that occurred without any complications for mothers and babies - Limited teaching materials and methodology - Participating mothers and infants all being healthy - Mothers were selected from a central hospital in Kathmandu with literate mothers due to human resource constraints, which limits the generalisability of the results

	● Did not take into account of the cost of the intervention
	● Questionnaire was collected through reporting by mothers without observing what the mothers did while caring their babies

Younes L, Houweling TAJ, Azad K, Kuddus A, Shaha S, Haq B, et al. The effect of participatory women's groups on infant feeding and child health knowledge, behaviour and outcomes in rural Bangladesh: a controlled before-and-after study. Journal of Epidemiology and Community Health. 2015;69(4):374-81.

Project Design	● Location – 18 clusters in three districts in Bangladesh representing a total population of 532996 people
	● Three districts – Bogra, Faridpur & Moulavibazar
	● The study clusters were selected during a previous cluster-randomised controlled trial
	● Intervention involved 162 women's groups that had previously focused on maternal and neonatal health issues as part of the earlier cluster-randomised trial (2005-2007)
	● These groups met on a monthly basis 2005-2009
	● From 2010, they proceeded through a participatory learning and action cycle focusing on health issues relating to children under 5 years of age. This study is an evaluation of that child health focused intervention
	● In April 2010, 162 women's groups started a cycle of 21 monthly meetings
	● Preintervention and postintervention cross-sectional surveys were conducted with mothers of children under 5 years using a structured questionnaire
	● A total of 51 755 individuals participated in the women's groups meetings, 2% of which were men
	● Pre Intervention survey was completed for 1897 women (from both intervention & control areas)
	● Post Intervention survey was completed for 2270 women
Outcome Indicators	● Mother's under-5 health-related knowledge
	● Under-5 health-related outcomes
Results	● Participation in a child health focused women's group intervention can improve a range of knowledge, behaviours and under-5 health outcomes

	• Women who had participated in the intervention had improved knowledge of hygienic practices, breastfeeding and diarrhoea treatment, and their children were more likely to be exclusively breastfed for longer • Children of women exposed to the intervention had fewer and short illness episodes compared with children in control areas
Strengths	
Weaknesses	• Some outcomes at baseline in the intervention area were higher than in control areas

Singh A, Klemm RDW, Mundy G, Pandey Rana P, Pun B, Cunningham K. Improving maternal, infant and young child nutrition in Nepal via peer mobilization. Public health nutrition. 2018;21(4):796-806.

Project Design	• Location – four districts: Bajhang, Bhojpur & Rupandehi • Cross-sectional household-level baseline and endline surveys were conducted 12 months apart • April 2014 – baseline surveys in 4 districts (n = 2496) • June 2014 – April 2015 – Peer facilitator (PF) interacted with pregnant women and mothers of children aged 0-23 months • April 2015 – endline surveys in 3 districts (n = 1890)
Outcome Indicators	• Four key MIYCN outcomes: child nutrition knowledge, maternal nutrition knowledge, child nutrition practices & maternal nutrition practices
Results	• Exposure to a PF for up to 1 year modestly improved several maternal and child knowledge and practice indicators compared with a comparison group with no PF exposure • Estimates were significant for five indicators: (1) knowing that fruits and vegetables were good for children (2) child dietary diversity (3) child minimum dietary diversity (4) maternal dietary diversity (5) maternal minimum dietary diversity • Frequency of exposure to a PF in the past 6 months was positively associated with the following maternal and child knowledge and practices: (i) child nutrition knowledge index score for those who had met a PF twice or three or more times; (ii) maternal nutrition knowledge index score for those who met the PF once, twice, or three or more times; (iii) diet diversity among children aged 7–23·9 months who met the PF once or three or more times; and (iv) diet diversity of mothers of children aged 7–23·9 months who met the PF three or more times • Our findings also show that frequency of contact with a PF may be a key element of the PF's success. Any exposure to a PF increased maternal nutrition knowledge but only exposure to a PF two or more times increased child nutrition knowledge

Strengths	
Weaknesses	• Control group also received Suaahard's core intervention package, making it difficult to disentangle the impact of the PF • Unable to control for sex of the child and other additional household dynamics in the regression models given limitations of the data set, despite awareness that these additional factors may have been important covariates • Small sample size and exposure duration of only 12 months have not have captured the full impact of the PF approach

Dhital R, Silwal RC, Simkhada P, Teijlingen EV, Jimba M. Assessing knowledge and behavioural changes on maternal and newborn health among mothers following post-earthquake health promotion in Nepal. PLoS One. 2019 Jul 25;14(7):e0220191.

Project Design	• Community based health promotion intervention • Uncontrolled before-and-after study • N = 377 • Mobilised the local health promoters and FCHV • 7 VDCs of Dhading district • Intervention ran from 2016 to 2018 • Key intervention activities included: a) Capacity building of FCHV b) Mothers' group meetings c) Health system strengthening
Outcome Indicators	• Knowledge of danger signs of pregnancy, childbirth and in newborns
Results	• Improved knowledge of danger signs • More likely to attend ANC • More likely to have an institutional delivery
Strengths	
Weaknesses	• Lacks control group

Azad K, Barnett S, Banerjee B, Shaha S, Khan K, Rego AR, et al. Effect of scaling up women's groups on birth outcomes in three rural districts in Bangladesh: a cluster-randomised controlled trial. The Lancet (British edition). 2010;375(9721):1193-202.

Project Design	- Two interventions in the same study area: - Community-based intervention with participatory women's groups to improve maternal and neonatal health outcomes - An intervention that involved training traditional birth attendants in bag-valve-mask resuscitation of neonates with symptoms of birth asphyxia - Three districts: - Bogra - Faridpur - Moulavibazar 18 unions (six per district) were selected with total population of 503 163 - Unions randomly allocated to either intervention or control - Women's group facilitators visited every tenth household within the intervention clusters and invited married women of reproductive age to join the groups - The groups initially only included women, but others joined later such as mothers-in-law, adolescents, and other women - Role of the facilitator was to activate and strengthen groups, to support them in identifying and prioritising maternal and neonatal problems, to help to identify possible strategies, and to support the planning, implementation, and monitoring of strategies in the community - All women's groups had finished their first meeting by Sept 2004 - Births and deaths in the study area were monitored between Feb 2005 – Dec 2007 - In 2007, 2363 (9%) women of reproductive age in the intervention cluster (n=27614) were group members - Groups held meetings once a month and completed a cycle of 20 meetings
Outcome Indicators	- Primary outcome of the women's group study was NMR (deaths in the first 28 days per 1000 live births) - Secondary outcomes were: - Maternal deaths (death of a pregnant woman within 42 days of cessation of pregnancy from any cause related to the pregnancy or its management but not from accidental causes) - Stillbirths (fetal death after 28 weeks of gestation but before delivery of the baby's head) - Uptake of antenatal and delivery services - Home-care practices during and after delivery

	5. Infant morbidity 6. Healthcare seeking behaviour (seeking care for any maternal or newborn illness or complication) 7. Perinatal mortality 8. Early and late NMR
Results	• No significant differences in most homecare practices or healthcare seeking behaviours between intervention and control clusters. However, saw higher frequencies of delayed bathing and exclusive breastfeeding in the intervention clusters but were not significant • Overall, the study showed that participatory women's groups did not significantly reduce neonatal mortality in poor rural populations of Bangladesh
Strengths	• All 162 groups continued to meet after the end of the program's cycle
Weaknesses	• Low population coverage, therefore, the threshold coverage or dose effect needs to be established • Difficulties in retaining facilitators and supervisors, which may have led to disruptions in meetings and reduced support for community mobilisation • Gender based barriers were strong in some intervention clusters such as having to ask husbands' and in-laws' permission to join group • Other women's groups linked to NGOs operated in our study area, and women were regularly asked to participate in NGO activities for which they could receive financial incentives

Bhutta ZA, Soofi S, Cousens S, Mohammad S, Memon ZA, Ali I, et al. Improvement of perinatal and newborn care in rural Pakistan through community-based strategies: a cluster-randomised effectiveness trial. The Lancet (British edition). 2011;377(9763):403-12.

Project Design	• Cluster randomised trial between Feb 2006 – March 2008 in Hala and Matiari subdistricts, Pakistan • Intervention delivered by LHWs through group sessions which consisted of promotion of antenatal care and maternal health education etc
Outcome Indicators	• Total deliveries • Number of births • Number of live births

	- Number of stillbirths - Neonatal deaths - Post neonatal deaths
Results	- By the last 6 months of the intervention, 67% of pregnant women in the intervention clusters had attended a group session run by LHWs - In the second year of the intervention, 40% of group sessions in the intervention clusters were attended by additional family members and at a quarter of the sessions, some husbands also attended - Rates of stillbirth and neonatal mortality were significantly lower in intervention clusters than control - Difference in women attending antenatal care in facilities was small and not significant - Women in the intervention clusters were more likely but not significantly to report delivering in a facility - Women in intervention clusters were significantly more likely to give colostrum, breastfeed within 30 min after birth, delay bathing beyond 6 hours, and receive a postnatal visit from the LHW within 3 days of delivery - No differences in care seeking patterns between the two groups - Few reported seeking care from the LHW for a suspected newborn illness beyond the first week of age
Strengths	- Significant reductions in stillbirths and neonatal mortality - Key household behaviours for maternal and early newborn care improved
Weaknesses	- Issue of contamination and diffusion between intervention and control clusters should be considered - Risk of over-reporting of recommended practices since data are based on mothers' verbal reports rather than observed behaviours - Lack of improvement in care seeking for newborn illnesses in the intervention clusters could be related to the poor quality of care for newborns in the local public sector facilities and the reluctance among families to travel long distances to seek newborn care

Tripathy P, Nair N, Barnett S, Mahapatra R, Borghi J, Rath S, et al. Effect of a participatory intervention with women's groups on birth outcomes and maternal depression in Jharkhand and Orissa, India: a cluster-randomised controlled trial. The Lancet (British edition). 2010;375(9721):1182-92.

Project Design	• Study was done in three districts of Jharkhand and Orissa – two of the poorest states in Eastern India • In intervention clusters, a facilitator convened 13 groups every month to support participatory action and learning for women such as clean delivery practices and care-seeking behaviour
Outcome Indicators	• Primary outcomes were reduction in NMR and maternal depression scores • Secondary outcomes were stillbirths, maternal and perinatal deaths, uptake of antenatal and delivery services, home care practices and health care seeking behaviour
Results	• 32% reduction in NMR during the 3-year trial • Stillbirth rates did not differ between intervention and control clusters • MMR was generally lower in intervention than in control clusters but was not significant • No difference in maternal depression scores • No differences were seen in health care seeking behaviour
Strengths	
Weaknesses	• Intervention and surveillance teams were not unaware of allocation • Inter-cluster migration

Choulagai BP, Onta S, Subedi N, Bhatta DN, Shrestha B, Petzold M, et al. A cluster-randomized evaluation of an intervention to increase skilled birth attendant utilization in mid- and far-western Nepal. Health Policy and Planning. 2017;32(8):1092-101.

Project Design	• Cluster randomised controlled trial • Three districts from mid- and far- western region of Nepal: 1. Bajhang 2. Dailekh 3. Kanchanpu • The districts were purposely selected to represent the three ecological zones (i.e. mountain, hill and Terai)

	• Randomised clusters from 36 of the 50 VDCs that participated in the baseline survey • 18 VDCs were allocated as either intervention or control • Five-component intervention to increase SBA service utilisation: 1. Increased family support to pregnant women for childbirth in a health facility (FCHVs and mothers' groups health regular meetings and discussions about promoting family support. FCHVs also discussed the importance of skilled birth care during home visits and mothers' group meetings in their respective VDCs 2. Financial assistance for women and families who seek SBA-assisted childbirth 3. Transport to a health facility for childbirth 4. Women-friendly environment at health facilities 5. SBA security • The intervention was implemented during May 2013 – April 2014 • N = 3844 women • Intervention = 1746 • Control = 2098
Outcome Indicators	• Primary outcome – skilled birth care utilisation • Secondary outcome – ANC utilisation
Results	• Increase in at least one ANC visit was significant • Changes in use of four or more ANC visits and skilled birth care were not significant • The incremental increase in initial ANC visits might result from awareness-raising activities in FCHV-facilitated mothers' group meetings • The absence of incremental increases in four or more ANC visits could relate to distance from a health facility, poor road conditions and limited means of transport • Another study in Nepal reported that women are more likely to attend four or more ANC visits when the availability of medical equipment, rooms, and skilled providers is adequate (Karkee et al. 2014) • The inadequate number of ANC visits may result from women's perception that ANC services were not useful to them or of low quality
Strengths	• Intervention was rooted in an extensive baseline survey

	• For scalability and sustainability of the intervention, they ensured that the components added few financial and structural demands on the existing health system • Randomised allocation of adequate number of clusters into intervention and control groups
Weaknesses	• Simultaneous implementation of all five components during the 1-year intervention period, thus precluding an effectiveness assessment of individual components • Although the baseline survey identified distance to the health facility and inadequate transport as important barriers, the intervention could not address the distance barrier • Moreover, although identified barriers included several supply-side factors (e.g. insufficient human resources, inadequate capacity and motivation of health workers, inadequate infrastructure and supply logistics at health facilities and issues related to the quality of services provided), the components of the study mostly addressed demand-side issues

Thapa P, Bangura AH, Nirola I, Citrin D, Belbase B, Bogati B, et al. The power of peers: an effectiveness evaluation of a cluster-controlled trial of group antenatal care in rural Nepal.(Report). Reproductive Health. 2019;16(1).

Project Design	• Location: - Sanfebagar, a rural municipality located in Province 7, a far-western hilly region of Nepal • Study design – non-randomised, cluster-controlled, type 1 hybrid effectiveness implementation trial design • Six of the 13 village clusters in the study population offered the group ANC program out of their local village clinics to all women presenting for antenatal care (at <24 weeks gestation) • Implementation began March 2015 to present • Groups received 4 two-hour antenatal sessions facilitated by a government nurse-midwife and a Nyaya Health Nepal-employed CHW that included ANC and facilitated peer discussion on a variety of pregnancy topics and birth planning • Intervention clusters were selected by convenience, based on political and programmatic considerations • Seven control village clusters offered the existing standard of ANC, as per national guidelines

	• Randomised design was not feasible due to government priorities in the study population • Nested cohort were surveyed to assess participants' knowledge of birth preparedness and key danger signs during pregnancy, labour and childbirth, the postpartum period, and in the newborn • Also assessed the cohort participants; attitudes and practices after delivery, including satisfaction with their ANC experience, birth planning practices, and barriers to institutional delivery • Also conducted focus group discussion (FGDs) and key informant interviews (KIIs) to explore the experience of the model and perceived mechanisms of impact, from a variety of perspectives • Intervention n = 62 • Control n = 52
Outcome Indicators	• Primary outcome – institutional birth rate & completion of at least 4 ANC visits • Secondary outcomes – one year postpartum modern contraceptive prevalence rate (PPCPR), stillbirth rate, perinatal mortality rate & infant mortality rate • Did not include maternal mortality or morbidity outcomes due to small sample size and data limitation from self-reported birth outcomes
Results	• Group ANC intervention did not lead to an improvement in the outcomes of institutional birth, ANC care completion, or contraceptive prevalence over the home visit care only clusters • Analysis reveals some success in group ANC at increasing knowledge of pregnancy danger signs, however, no relative success was observed in other key knowledge areas • Success for pregnancy danger signs may be due to the relatively high frequency that this topic was discussed compared to other topics during the course of group ANC • All of the knowledge indicators were quite low at the baseline and the endline in both clusters of the study, indicating very poor health literacy in this community and that neither the home visit care nor the group ANC program were particularly successful in increasing knowledge based on international standards • Our qualitative analysis reveals that women found that the groups provided an opportunity for learning and discussion, learning from each other, and a source of social support and empowerment • Both participants and providers noted difficulties with birth planning in a place where transportation, social support, and poverty remain challenges for women and their families.
Strengths	

Weaknesses	• Study was designed to enrol 2400 participants to achieve 80% power to detect effect size 5%. Enrolment was lower than expected, analysis is underpowered
	• Intervention was evaluated over a very short time frame
	• Recommended time frame to look at pregnancy-related interventions is three to five years given that a pregnancy is 10 months long
	• Given the small sample size, and programmatic and political allocation of control versus intervention groups, there were likely significant differences between the clusters themselves
	• The intervention group tended to be larger, with poorer road access, farther from the hospital, and with greater distances between village clinics and households. This likely further tilted the data in the direction of the null hypothesis

Manandhar DS, Osrin D, Shrestha BP, Mesko N, Morrison J, Tumbahangphe KM, et al. Effect of a participatory intervention with women's groups on birth outcomes in Nepal: cluster-randomised controlled trial. The Lancet (British edition). 2004;364(9438):970-9.

Project Design	• Study was done in Makwanpur district, Nepal – lies in Nepal's central region where the middle hills join the plains, population of about 400 000, total of 43 VDCs
	• Study period Nov 2001-Oct 2003
	• Enrolled a closed cohort of married women of reproductive age (15-49 years)
	• Study cluster – 24 VDC's randomly chosen from the 42 VDCs and split into 12 pairs (one cluster in each pair to either intervention or control)
	• Total 28 931 participants in 28 376 households
	• In each intervention cluster (consisting of nine wards), a female facilitator convened nine women's group meeting every month (one per month in each ward)
	• The facilitator supported groups through an action-learning cycle in which they identified local perinatal problems and formulated strategies to address them
Outcome Indicators	• The primary outcome was NMR
	• Other outcomes included stillbirths, maternal deaths, uptake of antenatal and delivery services. Home care practices, infant morbidity, and healthcare seeking
Results	• Reduced NMR by 30%
	• Stillbirth rates did not differ

	• MMR was reduced by 80%
	• Intervention seemed to bring about changes in home-care practices and healthcare seeking for both neonatal and maternal morbidity (such as antenatal care, to have taken haematinic supplements, to have given birth in a health facility with a trained attendant, to have used a clean home delivery kit or a boiled blade to cut the umbilical cord)
	• No differences were noted in delayed wrapping of newborn infants, early bathing, or breastfeeding
Strengths	• Cost effective • Looked at both demand-side and supply-side issues • Study emphasised participatory learning rather than instruction • 95% of groups remained active at the end of the trial despite no financial incentives to do so
Weaknesses	• There were some differences in literacy and poverty indications with the intervention and control areas so may have had an effect on NMR – warrants further investigation • Study was done in parallel with government trained female community health volunteer programs and health system strengthening activities in both intervention and control areas – would effect be the same if the study was done without the government programs happening at the same time?