Original Article

Coverage of home-based newborn care and screening by ASHA community health workers: Findings from a household survey in Chhattisgarh state of India

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Abstract

Background and Objectives: Community health workers known as Accredited Social Health Activists (ASHAs) provide home visits for home-based newborn care (HBNC) in India. The objectives of the study were to assess coverage of HBNC, to assess current practices of newborn care by the care providers and to assess status of screening of sick newborns by ASHAs in rural Chhattisgarh. **Methods:** The study was a quantitative cross-sectional study. Multi-stage random sampling was applied to draw a representative sample from rural Chhattisgarh. The survey collected primary data of 1928 newborns by interviewing the caregivers. Descriptive statistical analysis using cross tabulations was performed. Confidence intervals at 95% were computed for key indicators. **Results:** ASHAs were present during 84.3% of the deliveries. 74.1% newborns received the designated six home visits from ASHAs whereas 3.6% newborns did not receive any visits. Coverage of different important messages ranged from 74% to 90%. Around 95% of newborns were screened by ASHAs for signs of sickness. ASHAs identified 12.9% of newborns as sick. Of the identified sick newborns, 48.1% were referred by ASHAs to health facilities, whereas 34.7% were treated directly by ASHAs by using amoxicillin. Early initiation of breastfeeding was reported for 85.4% of newborns and skin-to-skin contact was practiced for 63.6%. **Conclusions:** ASHAs were able to achieve an adequate coverage of HBNC in rural Chhattisgarh. Uptake of desired newborn care practices by caregivers was found. Identification of sick newborn was also adequate. Further research is recommended to identify factors facilitating the coverage under HBNC.

Keywords: ASHA, home based newborn care, sick newborn

Introduction

Deaths in the first month of life, which are mostly preventable, represent 47% of the global deaths among children under five years of age.[1] Globally, 2.4 million children died in the first month of life in 2019.[2] Three quarters of the neonatal deaths are due to preventable medical conditions.[3,4] Low- and low-to-middle-income countries (LLMICs) including India are big contributors to the global burden of neonatal mortality.

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India has a neonatal mortality rate (NMR) of 29 per 1000 live births.[5] Even though infant mortality rate has declined substantially from 1950 to 2019, the reduction in NMR has been slower.[3] The major preventable reasons for neonatal mortality in India include birth asphyxia and neonatal sepsis.[6] Many of the neonatal illnesses can often be prevented or treated with postnatal care.[7]

Evidence suggests that effective interventions to reduce the NMR in settings with high mortality and weak health systems include outreach, family-community care, health education to improve home-care practices and a simultaneous expansion of clinical care.[8] Studies of community-based interventions in newborn care have shown that they are effective in reducing

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neonatal mortality.[9–11] Community-based interventions in India using trained community health workers (CHWs) have also shown similar findings. CHW-based interventions conducted in Maharashtra and Uttar Pradesh in India in late 1990s and early 2000 showed reductions in neonatal mortality by 62% and 54%, respectively, through multiple prenatal and postnatal home visits.[12,13] The major part of reduction in mortality was attributed to identification and treatment of sick newborns.[12]

Based on the evidence available, home-based newborn care (HBNC) was identified as a key strategy to provide continuum of care for newborns in India. This approach recognized that improvements in home-based practices were essential to ensure comprehensive primary health care for newborns, and CHWs could be equipped to make the necessary home-based interventions for this purpose.[12] HBNC was introduced in 2011 under the National Health Mission (NHM). The introduction of HBNC under NHM was through women CHWs known as ASHAs (accredited social health activists). The ASHA programme is a government initiative and it was implemented across the country from 2006 onwards.[14] It has grown to be one of the largest CHW programmes in the world. Currently, there are around a million ASHAs in India. There is a norm of having one ASHA per 1000 population, but in difficult geographies, ASHA can be selected to cover a smaller population. ASHAs are selected from their local communities and trained after selection.[15] Their training consists of ten short modules of around five to six days each.[15]

ASHAs carry out a wide range of functions which include preventive, promotive and curative services in maternal and child health, disease control, nutrition and surveillance. The roles ASHAs perform can be clubbed under three main categories: (a) providing health education and primary curative care for common illnesses; (b) linking families with formal healthcare services; (c) mobilizing communities for attainment of health rights. In literature, CHWs with such wide-ranging roles have been termed as "generalist" CHWs, as opposed to "specialist" CHWs who focus on a single aspect or disease.[16]

For HBNC, ASHAs conduct a series of home visits over the first six weeks of life of a newborn. The designated norm is of six visits (on day 3, 7, 14, 21, 28 and 42).[14] Apart from the six visits, ASHA is also expected to be present to advise the mother on the day of delivery. They provide advice to families on newborn care practices related to breastfeeding, hygiene and keeping the baby warm. They are also expected to examine the newborn for signs of sickness and to refer the sick newborn. Where referral is not feasible, ASHAs are expected to treat the sick newborn using amoxicillin.[14] ASHAs receive a cash incentive of INR 250 for completing the six visits for a newborn.[6,14] According to programme reports, more than 14 million newborns were visited by ASHAs annually, out of whom they could identify and refer around 0.54 million sick newborns to health facilities.[6]

There have been a few studies of the HBNC implemented through ASHAs in India. Most studies of HBNC have been focused on assessing knowledge or skills of ASHA.[17,18] There have been a few studies on coverage of newborns achieved by ASHAs under HBNC. Most such studies have been of small-scale interventions.[19–21] Another limitation of existing studies on HBNC is that they are mostly based on interviewing the ASHAs and not the families with newborns. There has been only one study in India that has reported the coverage of newborns under scaled-up HBNC.[21] The above study was in Uttar Pradesh, a state in north India. The above study examined the adequacy of visits in the first week of life and the advice given by the ASHA but, it did not cover the aspect of screening of newborn and identification of sick children. Also, given the diversity among Indian states and the large scale at which HBNC was implemented, further studies are needed to assess different aspects of HBNC in different states of India.

The present study was conducted in Chhattisgarh state where HBNC has been implemented in all rural areas of the state through 70,000 CHWs known as Mitanins. Chhattisgarh was the pioneer state in scaling up the CHW programme in 2002 and it was a precursor to the national launch of the ASHA initiative in 2006. The Mitanin CHWs of Chhattisgarh also became a part of the ASHA community. Chhattisgarh started training ASHAs in community-based newborn care in 2008, before the national roll-out started. Since then, ASHAs have been carrying out postnatal home visits. Most of the ASHAs (Mitanins) in Chhattisgarh completed the HBNC training by 2011.[6] Several rounds of refresher training have been conducted in Chhattisgarh to strengthen the skills of ASHAs in HBNC. According to assessments carried out by external agencies, their knowledge and skill level was found to be adequate.[22]

The current study was aimed at assessing the coverage of HBNC, after around a decade of its state-wide implementation in Chhattisgarh. The study assessed HBNC through interviews of mothers of newborns meant to be covered under HBNC. The present study had the following objectives:

- To assess the coverage of home-based newborn care provided by ASHAs in terms of home visits and the messages given
- To assess the current practices of newborn care in homes
- To assess the screening of newborns by ASHA, identification of sick newborns and their treatment and referral.

Material and Methods

Study Design and study setting: The current study was a quantitative cross-sectional study. A survey was conducted to interview caregivers in households having a child in the age group of 2–6 months. Multi-stage random sampling was applied to draw a representative sample of rural Chhattisgarh.

Sampling technique: For a confidence interval (CI) of 95% and acceptable error of 1%, a minimum sample size requirement of 865 households was calculated. In order to account for the multi-stage design, the above requirement was doubled and that brought the desired sample size to 1730 households.

From each of the 146 administrative blocks in the state, five habitations were selected using systematic random sampling. In each of the 730 habitations selected above, the sample included all households having a child in the 2–6 months age group. According to the population of these habitations, we expected to find around 2040 households with a child in the aforementioned age group.

Data collection took place in November 2020. Primary data was collected using a structured questionnaire. Information was collected on socio-demographic characteristics of family, newborn care practiced by family, number of home visits by ASHAs, advice provided by ASHAs, identification of sick newborns by ASHAs and their treatment or referral. The survey was able to interview caregivers of 1928 newborns.

Ethical consideration: Informed consent was obtained from each respondent for the interview.

Data management: The data was analysed using Stata v. 14. Descriptive statistical analysis using cross tabulations was performed. Confidence intervals at 95% were computed for key indicators and reported in parentheses.

Results

Sample profile - Households and newborns covered

The total interviewed caregivers were 1928. The profile of sample households is presented in Table 1.

Coverage under HBNC visits

Of the total newborns surveyed, 90.8% were born in institutions while the rest were delivered at home (n = 1928). ASHAs were present during 84.3% of the deliveries (n = 1928).

Table 2 provides the frequency by number of home visits by ASHAs after delivery.

Around three-fourth of the newborns had received the designated number, that is, at least six home visits from ASHA. Around 89% got three or more visits. There were 3.6% newborns who did not receive any home visits [Table 2].

Advice received during HBNC visits

The caregiver responses regarding the messages or advice given by ASHAs are summarized in Table 3.

It shows that the coverage of different key messages was between 74% (skin-to-skin contact) to 90% (hand-washing).

Newborn screening under HBNC

Table 4 gives the proportion of newborns screened by ASHAs for the different signs of sickness.

It shows that 4.9% of the newborns did not get screened by ASHAs. ASHAs screened 82.1% of newborns for any problems

Table 1: Sociodemographic characteristics of families and newborns

Variable	% (n=1928)
Caste (social group)	
Scheduled Tribes (ST)	37.8
Scheduled Caste (SC)	15.1
Other Backward Classes (OBC)	44.2
General	2.9
Education of mother	
Standard 8 and above	69.2
Standard 5 to 7	14.2
Standard 1 to 4	3.8
No education	12.7
Education of father	
Standard 8 and above	74.7
Standard 5 to 7	14.1
Standard 1 to 4	3.2
No education	8.9
Family size	
<5 members	22.3
5 to 10	69.2
>10 members	7.5
Age of the child at the time of interview	
2 to 4 months	63.8
5 to 6 months	36.2
Sex of the child	
Female	50.5
Male	49.5

Table 2: Coverage under HBNC visits in rural Chhattisgarh in 2020

Number of visits by Mitanin	Proportion of newborns with 95% CI (n=1928)
0 visits	3.6 (2.9-4.6)
1 visit	4.0 (3.2-5.0)
2 visits	3.5 (2.8-4.5)
3 visits	3.8 (3.1-4.8)
4 visits	4.8 (4.0-5.9)
5 visits	6.1 (5.1-7.3)
>6 visits	74.1 (72.1-76.0)

Table 3: Advice given by ASHAs during HBNC visits in rural Chhattisgarh in 2020

Messages or advice received from ASHAs	Proportion of newborns' families receiving the specific message or advice with 95% CI (n=1928)
Handwashing before handling the baby	90.4 (89.0-91.7)
Appropriate cord care	83.0 (81.4-84.7)
Avoiding pre-lacteal feed	81.3 (79.6-83.1)
Early initiation of breast feeding (within one hour of birth)	83.9 (82.2-85.5)
To maintain exclusive breastfeeding till 6 months age	85.8 (84.2-87.3)
Colostrum feeding	88.7 (87.3-90.2)
Wrapping the baby to keep it warm	89.7 (88.4-91.1)
Practicing skin-to-skin contact	74.0 (72.0-75.9)

in breastfeeding. Respiratory rate was the least covered among the key components of screening.

Identification of sick newborn

The proportion of newborns with different signs of sickness is shown in Table 5.

According to the caregivers, ASHAs had identified a total of 12.9% (11.1%–14.7%) of newborns to be having one or more signs of sickness.

Of the above identified sick newborns, 48.1% (43.0%–53.2%) were referred by ASHAs to health facilities for treatment, whereas 34.7% (29.1%–39.6%) were treated directly by ASHAs by using amoxicillin.

Newborn care practices followed by households

The practices of the households with regards to newborn care, as reported by the caregivers, are given in Table 6.

The caregivers reported early initiation of breastfeeding for 85.4% of newborns and colostrums feeding for 92.9%. Skin-to-skin contact was practiced for 63.6%. 95.7% of the caregivers reported that they were practicing hand-washing [Table 6].

Discussion

Appropriate home-based care is a necessary part of primary health care for newborns and the HBNC programme has been implemented nationally in India to achieve this purpose. This study of HBNC in rural Chhattisgarh was based on responses obtained from caregivers of newborns. A key finding of the study was that 74.1% of rural newborns had received the designated six visits for HBNC. A study of a small-scale intervention in Uttar Pradesh had reported a coverage rate of 66%.[19] Another study of HBNC in Uttar Pradesh had reported a coverage rate of 57%.[23] A study in Haryana had shown a coverage rate of 15% of newborns.[20] This shows that coverage of HBNC varies widely across Indian states.

In the current study, 96.4% of newborns received at least one home visit from ASHA. The above visits were in addition to the presence of ASHA on the day of delivery. An intervention study on HBNC conducted in Rajasthan showed that 85% of newborns in the intervention group received a home visit by ASHAs.[24] A study in Kenya had reported that 93% of newborns received three home visits.[25] The coverage of three home visits in the current study was 89%. The coverage of HBNC visits in the current study is similar to the highest rates reported in other studies of postnatal visits by CHWs in India and other LLMICs.

A large-scale study of HBNC by ASHAs in Uttar Pradesh showed that 70% of the newborns received at least one home visit from ASHAs in the first week of life, whereas 31% received two or more visits in that period.[21] It is difficult to make a comparison with the current study which measured the number of home visits during the first six weeks.

The most important part of the current study was regarding the screening of newborns by ASHAs for signs of sickness. It showed that ASHAs were able to identify, treat and refer sick

Table 4: Proportion of newborns screened by ASHA for different signs of sickness

Signs of sickness	Proportion of newborns screened with 95% CI (*n*=1928)
Respiratory rate	43.5 (41.3-45.7)
Temperature	58.7 (56.5-60.9)
Chest in-drawing	63.1 (60.9-65.2)
Consciousness	73.2 (71.3-75.2)
Crying	76.2 (74.3-78.1)
Umbilicus and skin	77.8 (75.9-79.7)
Breast feeding	82.1 (80.4-83.8)
None	4.9 (3.8-6.0)

Table 5: Proportion of newborns identified with a sign of sickness

Signs or symptoms	Proportion of newborns with 95% CI (*n*=1928)
Rashes on skin	5.3 (4.3-6.3)
Abscess in umbilicus	4.3 (3.4-5.1)
Fever	2.2 (1.8-2.7)
Increased respiratory rate	2.0 (1.6-2.4)
Unable to breastfeed	1.8 (1.5-2.2)
Unable to cry	1.7 (1.3-2.0)
Chest in-drawing	1.4 (1.0-1.8)
Unconsciousness	1.4 (1.1-1.6)
Distended abdomen	1.0 (0.7-1.3)
Vomiting	1.0 (0.7-1.3)
Hypothermia	0.7 (0.6-0.9)
Others	0.1 (0.0-0.2)
Any of above	12.9 (11.1-14.7)

Table 6: Proportion of newborns receiving different care practices from family

Indicators	Proportion of newborns receiving the practices with 95% CI (*n*=1928)
Initiation of breastfeeding	
Before 1 hour	85.4 (83.8-87.0)
2 to 6 hours	6.1 (5.7-6.5)
7 to 12 hours	0.5 (0.4-0.6)
13 to 24 hours	2.4 (2.2-2.6)
Above 24 hours	5.6 (5.2-5.9)
Colostrum feeding	
Yes	92.9 (91.2-94.5)
Hand washing	
Yes	95.7 (94.3-97.0)
Wrapping the baby to keep it warm	
Yes	94.5 (93.1-95.8)
Skin-to-skin contact	
Yes	63.6 (61.4-65.7)

newborns during home visits. The CHWs identified around 13 of the newborns as sick. A study in South Africa showed that 6% of newborns were identified as sick by CHWs, whereas the proportion in a Bangladesh study was 4% and 1.6% in a study from Kenya.[25–27]

When advised by ASHAs, caregivers of 48% of the sick newborns identified in HBNC could take the newborn to a health facility for treatment. This was in addition to the 35% among the sick newborns who were directly treated by ASHAs. The two options combined ensured that around 83% of the identified sick newborns could receive treatment. In comparison, a study in Bangladesh had reported a referral compliance rate of 54%, whereas it was 95% in a South African study.[26,27] This suggests that equipping ASHAs to treat sick newborns was an appropriate strategy in rural Chhattisgarh that has many areas with poor connectivity. It can be of significant value in remote areas lacking access to other health facilities. Relying solely on referrals in such geographies can result in many sick newborns remaining untreated.

The current study found that 85% of caregivers in the study initiated breastfeeding the newborns within one hour of birth. A study conducted in Chhattisgarh in 2010 had shown that 50 newborns were breastfed within one hour of birth.[28] This shows a considerable improvement in the above aspect over the last decade in Chhattisgarh. A study conducted in Haryana showed the above rate as 70%, whereas it was 58% in an Uttar Pradesh study.[20,21] Intervention studies from Pakistan, Bangladesh and Ethiopia have shown that home visits by CHWs can improve early breastfeeding rates.[29–31]

The current study found that 93% of the newborns were fed colostrum. Studies conducted in Haryana and Tamil Nadu have shown similar rates of 87% and 97.5%, respectively.[20,29] Studies have reported that 84% of newborns in Ethiopia, 97% in Egypt, 93% in Uganda and 76% of newborns in Pakistan received colostrums.[30,31] The above studies in LLMICs have shown that colostrum feeding can be improved through home visits by CHWs.

In the current study, the practice of skin-to-skin contact was reported by caregivers of 64% of newborns. This result seems to be greater than what has been reported from other parts of India. Indian studies have shown around 20%–24% of newborns received such care.[19,20] A study conducted in Uganda showed 81% of newborns receiving this care, whereas it was 44% in a study in Ghana.[32,33] Even though skin-to-skin contact has been recognised as an effective strategy to reduce hypothermia in poor populations, the global promotion of this strategy seems to be weak. In the current study, 94.5% of caregivers reported that they wrapped the babies for keeping them warm. It was similar to the rate of 97% found in Egypt.[34] A study in Uganda showed that 85% performed wrapping and the practice was attributed to the health education given.[35]

In the current study, 96% of caregivers reported washing hands before handling a newborn. A study conducted in Haryana had reported 35% of caregivers practicing this.[20] A study in Egypt showed that 53% of mothers practiced handwashing before handling newborns.[34]

The above findings regarding newborn care practices reported in this study are not novel but they can be of help in assessing the efforts of CHWs under HBNC. In most of the desired practices, Chhattisgarh performed better than other parts of India. It also compared well with the results achieved by CHW interventions internationally. The caregivers in the current study could recall most of the essential messages of HBNC. This suggests that the home visits of ASHAs in Chhattisgarh were useful in improving newborn care practices in families.

Strengths of the study: The current study adds to the scarce literature available on India's scaled-up HBNC programme. It is also one of the rare studies to measure the performance of ASHAs by interviewing the caregivers of newborns. This is the first study to report the coverage of newborns in screening for signs of sickness under the scaled-up HBNC programme. This is the first study to report the proportion of newborns identified as sick during HBNC visits by ASHAs. This is also the first study in the country to report the proportion of sick newborn referred or treated by ASHAs.

Future research is recommended to identify the factors or processes that enabled the high coverage under HBNC in Chhattisgarh. Also, further research will be needed to find out the impact of HBNC coverage on health outcomes of the newborns.

Limitations: This is a cross-sectional descriptive study. The study was not equipped to find out the effect of HBNC on the newborn care practices in households. The study did not collect information on neonatal mortality and could not link health outcomes in newborns to implementation of HBNC. The newborn care practices were self-reported by the caregivers.

Conclusion

The study concludes that the ASHAs were able to achieve an adequate coverage of HBNC in rural Chhattisgarh. They were able to cover most of the essential messages of HBNC during their home visits. This was reflected in the uptake of desired newborn care practices by caregivers. The coverage of newborns in terms of examining them for signs of sickness and identifying sick newborns was also adequate. Training ASHAs for identification and treatment of sick newborns seems to be an appropriate strategy in Indian context, especially in rural and tribal areas with poor connectivity. This shows that HBNC can be a scaled-up intervention for strengthening primary health care of newborns. Further research is recommended to find out the factors facilitating the HBNC coverage in Chhattisgarh.

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Conflicts of interest

There are no conflicts of interest.

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