

ORIGINAL ARTICLE

An Assessment of Home-Based Newborn Care Plus Innovation in Six districts of Rajasthan: A Cross Sectional Comparative Analysis

Kezia Katherine Yonzon¹, Nabamallika Dehingia², Varun Alwadhi³, Kultar Singh⁴, Harish Kumar⁵, Ashfaq Bhat⁶, Rajat Khanna⁷, Ajay Khera⁸

¹M.S.W., Sambodhi Research and Communications Private Limited; ²PhD., Center on Gender Equity and Health, UC San Diego; ³M.D. Paediatrics, M.B.B.S., Kalawati Saran Children Hospital, New Delhi, India; ⁴M.B.A. Sambodhi Research and Communications Private Limited; ⁵M.D. Paediatrics, M.B.B.S., Norway India Partnership Initiative, New Delhi, India; ⁶M.P.H, M.B.B.S., Norway India Partnership Initiative, New Delhi, India; ⁷M.P.S., M.Sc., M.Com., Norway India Partnership Initiative, New Delhi, India; ⁸M.D. Public Health, D.G.O., M.B.B.S., Child Health Division, MoHFW, Gol, New Delhi, India

Abstract	Introduction	Methodology	Results	Conclusion	References	Citation	Tables / Figures
--------------------------	------------------------------	-----------------------------	-------------------------	----------------------------	----------------------------	--------------------------	----------------------------------

Corresponding Author

Corresponding Author: Ashfaq Bhat, D103 Parasvsnath Prestige, Sector 93A, Noida, Gautam Budh Nagar, Uttar Pradesh, India
E Mail ID: bhatashfaq@gmail.com



Citation

Yonzon KK, Dehingia N, Alwadhi V, Singh K, Kumar H, Bhat A, Khanna R, Khera A. An Assessment of Home-Based Newborn Care Plus Innovation in Six districts of Rajasthan: A Cross Sectional Comparative Analysis. Indian J Comm Health. 2019;31(3):338-346.

Source of Funding: Norway India Partnership Initiative (NIPI) **Conflict of Interest:** None declared

Article Cycle

Received: 28/06/2019; **Revision:** 03/09/2019; **Accepted:** 15/09/2019; **Published:** 30/09/2019

This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/).

Abstract

Background: To improve coverage of key child health community practices, Home Based Infant Care (HBNC+) was implemented with support of Norway India Partnership Initiative (NIPI) in 4 States of Rajasthan, Madhya Pradesh, Bihar and Odisha. The innovation aimed at improving coverage of key child health interventions through home visits by community health worker, Accredited Social Health Activist (ASHA). **Aims & Objective:** This paper elucidates the results from the assessment of implementation in intervention versus control districts of Rajasthan.

Material & Methods: A cross-sectional intervention-control design with a sample size of 3211 mothers of children in age group 0 to 23 months was adopted. **Results:** 85 percent of the children (aged 3-23 months) received at least one infant care home visit in the intervention districts in comparison to 32 percent in control. Significant improvements were found in terms of exclusive breastfeeding, weighing and Iron Folic Acid (IFA) consumption and availability of ORS and Iron Syrup in intervention districts. 15 percent additional children had weight plotted in growth charts and 24 percent more consumed IFA syrup bi-weekly in intervention districts. **Conclusion:** Home visits in infancy is a scalable model and can lead to improvement of community child health practices.

Keywords

Home Based Newborn Care Plus; HBNC+; Norway India Partnership Initiative; NIPI

Introduction

Infant mortality is one of the most sensitive indicators of population health. Around 4.5 million infant deaths occurred globally in 2015 (1). The key causes of infant deaths are pneumonia, diarrhea and

birth related complications. (2) Micronutrient deficiencies, stunting and wasting also contribute around 35 percent of diseases in children under five. (3) India accounts for 21 per cent of under-five deaths globally. (4) Prior research suggests that

community-based interventions and home visitations implemented by community health workers (CHWs) can contribute significantly to improving maternal and child health care outcomes, especially in low resource settings. (5,6,7)

In India, Home Based Newborn Care (HBNC) was launched in 2011 and provides follow up of the newborns until the first 42 days. (8) While HBNC has been instrumental in enhancing newborn survival rates, postnatal care follow-up beyond neonatal stages remain weak. (9,10) A continuum of care innovative packaging model till one year - "Home Based Infant Care" (HBNC+) was implemented by 4 states health societies under Norway India Partnership Initiative. This innovative delivery mechanism is based on the premise that home visits by community workers with the necessary skills during the first 1000 days can enhance child survival, growth and development.

Aims & Objectives

The primary objective of this study was to

1. Conduct a comparative analysis between HBNC+ intervention districts with control districts to measure immediate outputs and outcome of the HBNC+ activities in Rajasthan,
2. Provide evidence for Assessing HBNC+ usability and scalability countrywide.

Material & Methods

Study Areas and Design of the Study: This study was conducted in 6 districts of in Rajasthan, India. A post-only intervention and control design was employed to assess the differences in child health outcomes between intervention and control districts. The findings are assessed cross-sectionally.

Sampling Design: A multistage sampling methodology was employed for sample selection. The study was conducted in three intervention districts of Rajasthan namely; Alwar, Bharatpur and Dausa, and three control districts: Dhaulpur, Jaipur and Dungarpur. While intervention districts were selected randomly, a-priori matching was used to select three control districts, based on the indicators: literacy rate, population density, urban to rural population ratio, Scheduled Caste population (a proxy for marginalization). Within each selected district, two blocks were chosen; the intervention blocks were chosen based on purposive sampling whereas the control blocks were chosen using a-priori matching. Within each block, two villages were randomly selected as the primary Sampling Unit

(PSU) for this study. The multistage sampling design is mentioned under (Figure 1).

Study Population: An enumeration exercise identified all the women who had had a live birth in the past 24 months, in the sampled PSUs. From those identified, the required number of women were sampled randomly and approached for the interview.

The study assessed child health outcomes across three groups: children of age 0-5 months, children of age 6-11 months and children of age 12-23 months.

Sample Size: Sample sizes for each of three groups were calculated using a two-sample formula (11):

$$n = \frac{D [Z1 - \alpha \sqrt{2P(1-P)} + Z1 - \beta \sqrt{P1(1-P1)} + P2(1-P2)]^2}{(P2 - P1)^2}$$

D = Design Effect. We considered a value of 1 for design effect; P1 = Baseline estimate of the indicator of interest; P2 = End line estimate of the indicator of interest; P = {(P1 + P2)/2}, Average of P1 & P2; Z1- α = z-value for corresponding significance level (1.96 for 95 percent) ; Z1- β = z-value for corresponding power of the study (0.84 for 80 percent power)

For these three categories, the indicators used for estimating the sample sizes were current exclusive breastfeeding rates for children in the age group of 0-5 months of age, children receiving complementary food along with breast milk in the age group of 6-11 months of age and full immunization rates for children of in the age group of 12-23 months of age. The data on these indicators were taken from NFHS 4 (2015-16). A total sample size of 2986 was covered during the data collection for the three groups in both intervention and control districts against the estimated sample size of 3211 children including non-response rate of 15%. The data collection completion rate was 93%. The details of the population covered under each of the three categories are mentioned in (Table 1).

Additionally, the ASHAs assigned to the sampled villages were also interviewed. A total of 36 ASHAs in intervention districts and 39 ASHAs in control districts were interviewed.

Data Collection Strategy: The tools were pilot tested in two villages, which were not part of the sample frame. Data collection was conducted by female research assistants trained in maternal and child health outcome domain, health systems and survey research. All participants were interviewed in a private setting with the interviews lasting for around 60 minutes. Data was collected on mobile handheld

devices and included no identifiable information; individuals were not tracked for purposes of the evaluation.

Ethical Consideration and Consent: All participants agreeing to participate in the study provided informed written consent prior to the survey. Participant was assured of their privacy and all identifiers were removed from data sets. No support (financial or services) of any kind was provided to the respondents during the data collection process. Respondents selected randomly and were above 18 years of age and physically fit to provide consent to the interview were selected for the study.

Study Duration: The study was conducted in the year 2015. The data collection in particular spanned for two months (August-September 2015).

Measures: Knowledge of ASHAs on different feeding practices were assessed by asking questions "For how many months, should a child be given only mother's milk and not even water?", "At what age should complementary feeding be started?" and "How many times should a 6 – 12 months old infant be fed each day?". ASHAs reporting the answers as six, six and three to four times respectively were labelled as being aware of the corresponding feeding practice. Similarly, questions on method of preparation of ORS (adding 1 litre water to 1 packet of ORS) and situations in which a child should be identified as malnourished (growth curve on growth monitoring chart moving towards red zone) were asked to assess their awareness regarding the same. Awareness of the ASHAs on correct dosage and frequency of IFA syrup to be given to a child aged 6 to 12 months (1 ml bi-weekly) was also assessed. ASHAs were asked to list down the critical occasions for handwashing (post defecation, post cleaning the child after he/she defecates, before preparing food, before eating and before feeding the child) Those who listed down all the five items were labelled as being aware of correct handwashing practices.

The variable on receipt of all the 4 HBNC+ home visit by ASHA- when the child reached 3, 6, 9 and 12 months of age assessed the coverage of the HBNC+ home visits by ASHA. Women with child older than 6 months of age who had ever received ORS for the index child from the ASHA, were labelled as having ever received ORS.

Current exclusive breastfeeding, complementary feeding practices, immunization and handwashing practices were the indicators on correct childcare

practices by mothers. Current exclusive breastfeeding was assessed based on a current status measurement (24-hour recall) for all children of age group 0-5 months, using the indicator established by the World Health Organization (12,13). Complementary feeding practices included variables on timely initiation of complementary feeding, adequate times food was fed and adequate number of food groups fed to the child. Mothers who responded that they fed solid/semi-solid food to their child when they turned 6 months of age were labelled as having initiated complementary feeding in time. Mothers who fed their children 3 or more times during a day were considered to have fed their child adequately. Similarly, mothers who fed their children at least 4 different food groups in the past 24 hours were labelled as having fed adequate number of food groups. The different food groups were based on standard WHO guidelines for complementary feeding. Full immunization included BCG, three doses of OPV, three doses of DPT and measles vaccine. The variables on IFA consumption and ORS consumption were captured by asking the mother if they gave IFA to their child in the last two weeks and ORS when the child had diarrhea in the past two weeks respectively.

The outcomes were assessed for different categories of children based on global and national standards of measurement. Current exclusive breastfeeding was measured for infants of age group 0-5 months. The indicator was also assessed for individual age groups- 3, 4 and 5 months respectively, to evaluate the drop in breastfeeding rates. Timely initiation of complementary feeding was assessed for 6-9 months and adequate times of feeding and adequate number of food groups fed was assessed for 6-11 months' children. Full immunization was measured for 12-23 months' children. While handwashing was measured for the complete sample of mothers with child of age 0-23 months, IFA consumption considered children of age group 6-23 months. Occurrence of diarrhea and consumption of ORS for the same was measured for children of age group 6-11 months.

Data Analysis: Descriptive analyses were used to characterize the sample, as a whole and by the outcomes of interest. Chi square analyses were used to assess differences of outcomes between intervention and control districts. Crude and adjusted logistic regression models were used to determine whether the differences in outcomes

between intervention and control were significant. Data were analyzed using STATA 13.0 software (StataCorp, USA).

Results

Out of the 2986 mothers that were interviewed on various aspects of HBNC+ for the study, the average age of mothers was 25 years for all the three categories: mothers with child of age 0-5 months, mothers with child of age 6-11 months and mothers with child of age 12-23 months. Less than 40 per cent were educated up to lower secondary (8th to 10th). For mothers of 0-5 months' child, 31 percent had never attended school. The numbers stood at 36 percent for the other two categories. Around 30 percent of mothers of 0-5 months old, 28 percent of mothers of 6-11 months and 27 percent of mothers of 12-23 months' children were BPL card holders. Only 22 percent households with 0-5 months old children had salaried income, while 19 and 20 percent of households with 6-11 months and 12-23 months' children respectively had the same. As shown in (Table 2), there were no statistical differences in socio demographic profile of intervention and control districts.

(Table 3) shows the knowledge level of ASHAs, related to childcare. For both intervention and control, awareness of child's age till which exclusive breastfeeding is to be practiced was 100 percent. Around 11 percent more ASHAs in intervention districts, as compared to control district had knowledge of correct month after birth in which complementary feeding should be initiated (78 percent vs 67 percent). Knowledge of frequency of feeding an infant also saw greater coverage among ASHAs in intervention districts as compared to control districts (53 percent vs 44 percent). In intervention districts, 11 percent ASHAs could list out all the critical occasions during which a mother should wash her hands and 8 percent in control districts could do the same. (Table 4) presents the provision of services by ASHAs. In intervention districts, 46 percent women received all the four HBNC+ home visits by ASHA, whereas in control districts, 12 percent women received the same. The coverage of the home visits decreases with increasing age of the child in intervention districts. While 84 percent women received ASHA home visits when the child turned 3 months of age, the coverage reduced to 60 percent for the visit when child turns 12 months of age.

In terms of child care practices, as shown in (Table 5), 73 percent mothers with child 0-5 months in intervention districts were practicing exclusive breastfeeding while only 65 percent mothers in control districts were doing the same. The current exclusive breastfeeding rates decreased with increasing age of the child (from 3 to 5 months). However, the drop-in intervention districts (19 percent) was lesser than the drop-in control districts (32 percent). In terms of complementary feeding, greater percentage of infants of age group 6-9 months were being fed solid or semi-solid food in intervention districts as compared to control districts (79 percent vs 74 percent). Full immunization rate was significantly higher in control districts as compared to intervention districts (83 percent vs 76 percent). In intervention districts, 34 percent children were given IFA syrup in the past two weeks in comparison to only 10 percent being provided in control districts, (p value less than 0.05 for the chi-square test). No significant differences were found in terms of ORS usage and handwashing practices between intervention and control districts. Around 50 percent of the sampled children in intervention districts were being weighed as compared to 19 percent in control districts. (Table 6) shows the adjusted odds for the key outcomes with regards to intervention and control districts. Separate models for each of the outcomes were run, adjusting for all the socio-demographic covariates- caste, religion, schooling status and Below Poverty Line (BPL) card holder status. Women with children of age 0-5 months in intervention districts were more likely to exclusively breastfeed their child, as compared to women in control districts (Adjusted Odds Ratio: 1.56 95% CI: 1.14-2.13). The odds of mothers of children 6-11 months feeding adequate number of times were higher in intervention districts as compared to control districts. Similar results were observed for consumption of IFA for children of age group 6-23 months. Children in intervention districts were around 4 times more likely to be given IFA (AOR: 4.30 95% CI: 3.35-5.51).

Discussion

This study provides evidence in support of significant differences between intervention and control districts in terms of ASHAs providing home visits to mothers when their child turns 3,6,9 and 12 months of age. Significantly higher number of children in intervention districts were receiving ORS packets

and were being weighed. In terms of providing services to mothers, ASHAs in intervention districts were thus performing significantly better than their control district counterparts. This study also looks at whether the provision of these services has translated itself into better childcare practices such as feeding practices, handwashing, IFA and ORS consumption and immunization.

Prior studies conducted in different low-resource settings across the globe provide evidence in support of home visits by trained community health workers leading to improved child care practices. (14,15,16) A study conducted in Dhaka showed how trained community level peered counsellors conducted home visits to improve exclusive breastfeeding rates. Another controlled trial conducted in Ghana showed that home visits by health workers improved immunization rates significantly. The findings of this study adds to this literature by elucidating the role played by home visits conducted by CHWs (ASHAs in this case) during specific critical time periods after a child's birth, in improving feeding practices, provision of growth monitoring and to keep a check of malnourished children. (17)

Inappropriate breastfeeding practices and delayed complementary feeding are two of the most common factors causing malnutrition in children between 6 months and 2 years. Inevitably, feeding practices become one of the important elements of the program, given that reducing malnutrition is one of its objectives. No significant difference was observed in the knowledge of ASHAs in intervention and control districts regarding exclusive breastfeeding. One probable reason for the absence of difference in ASHAs knowledge could be that counselling on exclusive breastfeeding is not exclusive to the HBNC+ program but is an integral part of ASHAs roles and responsibilities. However, while the knowledge rates were similar in both intervention and control districts, the actual practice of exclusive breastfeeding saw reduced coverage in control districts. Knowledge was thus not being completely translated into practice in the control districts. In line with other studies, it was found that women in HBNC+ areas, or women receiving more home visits from community health workers (ASHAs) are more likely to exclusively breastfeed their child. (17) Additionally, the drop in exclusive breastfeeding rates from when the child turns 3 months of age to 5 months of age was larger in control districts as compared to intervention

districts. Prior research has indicated that this drop in the rates could be related to various misconceptions among mothers, related to weight gain by child as well as mothers taking lesser care of the child with increasing age. (19) ASHAs conducting the four home visits in intervention districts were possibly informing the mothers about breastfeeding practices and the misconceptions around childcare, whereas those in control districts were not.

For complementary feeding, the study observed that there was difference between intervention and control in terms of infants of 6-9 months of age being fed solid and semi-solid food. On adjusting for socio-demographic factors, it was also seen that infants in intervention districts have a greater likelihood of being fed adequate number of times. On accounting for socio-demographic factors, the effect of the program is more pronounced. The better performance of intervention districts when compared to control districts in terms of exclusive breastfeeding and complementary feeding throws light on the possible positive impact of the HBNC+ program.

The study observed that there was not any significant difference between intervention and control districts with regards to immunization rates. One probable reason for this could be that improving immunization rates is one of the roles of ASHAs as a worker of the health system. This function is not exclusive to HBNC+ program. Even though growth monitoring had significantly greater coverage in intervention districts as compared to control districts, it was still far from desirable. It could be said that this component needs extra attention from HBNC+ in order to drive greater improvements in reducing mortality and malnourishment. Similar to growth monitoring, bi-weekly IFA consumption was significantly higher in intervention districts. Women in intervention districts were four times likely to feed their infants IFA when compared to women in control districts. Growth monitoring and IFA are thus definitely two components where the program has improved from very low rates of coverage and might show greater improvement with continued implementation of the program.

Conclusion

With completion of over a year of its implementation, the study observed that HBNC+ areas saw significantly higher number of new mothers receiving home visits by ASHAs. A higher

percentage of mothers in intervention districts are receiving the services from the ASHAs. It was observed that the intervention districts were performing better than the control districts, especially in terms of growth monitoring, feeding practices and IFA supplementation. However, it can be deduced from the findings that knowledge has not completely been translated into practice. Going ahead, a greater emphasis on ensuring that the existing gap between knowledge and action is filled would help in achieving the broader objectives of the program.

Recommendation

While there is evidence of better health outcomes and improved essential newborn care due to HBNC, there is no available evidence on health outcomes due to structured visitations by the community health workers beyond the post neonatal period. Further this study adds to the evidence that Home visits in infancy is a scalable model and can lead to improvement of community child health practices.

Limitation of the study

The study has a few limitations. First being the low sample size for children with episodes of diarrhea in the past two weeks. The coverage rates of ORS consumption during diarrhea was hence difficult to comment on. Second being generalizability; with the study findings being specific to Rajasthan, similar programs implemented in other regions of the world might generate different outcomes. Finally, the study did not capture elements related to early child development which was a key component of HBNC+. Thus, further studies to assess both uptake of ORS during diarrhea and early child development are required to be able to provide a comprehensive understanding of the effects of HBNC+

Relevance of the study

The study delineates key findings on critical infant care outcomes, which are often proven to have direct implications on infant mortality and morbidity. It sets the premise for the need of continued infant care beyond 42 days post-partum. With significant positive results showcased by the intervention, a renewed focus on continuum of infant care and at scale is elucidated.

Authors Contribution

YKK, DM, SK; Conceptualization of the design, implementation of the study and drafting the manuscript; AV, KH, KR, KA; substantial contribution

to conceptualization and design of the study and interpreting the results; BA; revised and finalized the manuscript.

Acknowledgement

This study has been done with funding from NIPI. Special thanks to the state, district and block government officials for their contributions towards understanding the implementation on the ground. We are grateful to the mothers and ASHAs who spoke with us despite their busy schedule. The study greatly benefited by the guidance provided by Norway India Partnership Initiative project team. Their dedication and valuable guidance are highly appreciated.

References

1. Ashworth A, Waterlow JC. Infant mortality in developing countries. *Arch Dis Child*. 1982 Nov;57(11):882-4. doi: 10.1136/adc.57.11.882. PubMed PMID: 7149765; PubMed Central PMCID: PMC1628029. [\[PubMed\]](#)
2. Baqui, A. H., El-Arifeen, S., Darmstadt, G. L., Ahmed, S., Williams, E. K., Seraji, H. R., . . . Black, R. E. (2008). Effect of community-based newborn-care intervention package implemented through two service-delivery strategies in Sylhet district, Bangladesh: a cluster-randomised controlled trial. *The Lancet*, 371(9628), 1936-1944. doi:10.1016/s0140-6736(08)60835-1
3. Bhutta, Z. (2008). Implementing community-based perinatal care: results from a pilot study in rural Pakistan. *Bulletin of the World Health Organization*, 2008(6), 452-459. doi:10.2471/blt.07.045849
4. Black, R. E., Morris, S. S., & Bryce, J. (2003). Where and why are 10 million children dying every year? *Child: Care, Health and Development*, 29(6), 584-584. doi:10.1046/j.1365-2214.2003.00376_5.x
5. Bangladesh Rehabilitation Assistance Committee. (2014). *Scaling Up and Sustaining Support for Improved Infant and Young Child Feeding, BRAC's Experience through the Alive & Thrive Initiative in Bangladesh*. Dhaka, Bangladesh: BRAC.
6. Claeson, M., & Bos, E. R. (2000). Reducing child mortality in India in the new millennium. *Bulletin of the World Health Organization*, 1192-1199.
7. Haider, R., Ashworth, A., Kabir, I., & Huttly, S. R. (2000). Effect of community-based peer counsellors on exclusive breastfeeding practices in Dhaka, Bangladesh: a randomised controlled trial. *The Lancet*, 356(9242), 1643-1647. doi:10.1016/s0140-6736(00)03159-7
8. Jawarkar, A.K., Lokare, P.O. & Dore, S. (2012). Study of socio-demographic and maternal determinants influencing birth-weight. *MGMIS*, 28-33.
9. Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS. How many child deaths can we prevent this year?. *Lancet*. 2003 Jul 5;362(9377):65-71. doi: 10.1016/S0140-6736(03)13811-1. Review. PubMed PMID: 12853204. [\[PubMed\]](#)

10. Kevany, R. B. (1996). Maximizing immunization coverage through home visits: a controlled trial in an urban area of Ghana. WHO Bulletin, 74.
11. Liu, L., Hill, K., Oza, S., Hogan, D., Chu, Y., Cousens, S., . . . Black, R. E. (2016). Levels and Causes of Mortality under Age Five Years. Disease Control Priorities, Third Edition (Volume 2): Reproductive, Maternal, Newborn, and Child Health, 71-83. doi:10.1596/978-1-4648-0348-2_ch4
12. Lozano R, Wang H, Foreman KJ, Rajaratnam JK, Naghavi M, Marcus JR, Dwyer-Lindgren L, Lofgren KT, Phillips D, Atkinson C, Lopez AD, Murray CJ. Progress towards Millennium Development Goals 4 and 5 on maternal and child mortality: an updated systematic analysis. Lancet. 2011 Sep 24;378(9797):1139-65. doi: 10.1016/S0140-6736(11)61337-8. Epub 2011 Sep 19. PubMed PMID: 21937100.[PubMed],
13. Mannan, I., Rahman, S. M., Sania, A., Seraji, H. R., Arifeen, S. E., Winch, P. J., . . . Baqui, A. (2008). Can early postpartum home visits by trained community health workers improve breastfeeding of newborns? Journal of Perinatology, 28(9), 632-640. doi:10.1038/jp.2008.64
14. Gilmore B, McAuliffe E. Effectiveness of community health workers delivering preventive interventions for maternal and child health in low- and middle-income countries: a systematic review. BMC Public Health. 2013 Sep 13;13:847. doi: 10.1186/1471-2458-13-847. Review. PubMed PMID: 24034792; PubMed Central PMCID: PMC3848754.[PubMed]
15. MoHFW. (2011). Home Based Newborn Care(HBNC) Guidelines, 2011. NEw Delhi: MoHFW.
16. Mohllajee, A. P., Curtis, K. M., Morrow, B., & Marchbanks, P. A. (2007). Pregnancy Intention and Its Relationship to Birth and Maternal Outcomes. Obstetrics & Gynecology, 109(3), 678-686. doi:10.1097/01.aog.0000255666.78427.c5
17. National Institute of Medical Statistics, I. C. (2012). Infant and child mortality in India: Levels, Trends and Determinants. New Delhi: UNICEF.
18. López, P. O., & Bréart, G. (2013). Sociodemographic characteristics of mother’s population and risk of preterm birth in Chile. Reproductive Health, 10(1). doi:10.1186/1742-4755-10-26
19. Perera PJ, Ranathunga N, Fernando MP, Sampath W, Samaranyake GB. Actual exclusive breastfeeding rates and determinants among a cohort of children living in Gampaha district Sri Lanka: A prospective observational study. Int Breastfeed J. 2012 Dec 22;7(1):21. doi: 10.1186/1746-4358-7-21. PubMed PMID: 23259860; PubMed Central PMCID: PMC3546863.[PubMed]

Tables

TABLE 1 POPULATION COVERED UNDER EACH OF THE THREE CATEGORIES

Target group	Intervention	Control	Total
Mothers of child aged 0-2 month	233	224	457
Mothers of child aged 3-5 month	183	209	392
Mothers of child aged 6-11 month	526	512	1038
Mothers of child aged 12-23 month	544	555	1099
Total	1486	1500	2986

TABLE 2 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF INTERVIEWED WOMEN

Indicator	Intervention Districts		Control Districts		p-value
	N=1486	% mean	N=1500	% mean	
Mean age	1486	24.9	1500	24.9	.88
Ever attended school	977	65.8	976	65.1	.69
BPL card holders	381	23.6	378	23.7	.90
SC/ST	630	42.4	602	40.1	.21

TABLE 3 KNOWLEDGE OF ASHAS ON SPECIFIC CHILD CARE TOPICS

Indicators	Intervention		Control		Chi square value p-value
	N=36	%	N=39	%	
Awareness of child’s age till which exclusive breastfeeding is to be continued	36	100	39	100	1.0
Awareness of time of initiation of complementary feeding	28	77.7	26	67	.28
Awareness of number of times to feed an infant in each day	19	52.7	17	44	.42
Awareness about critical occasions for washing hands	4	11	3	8	.61
Awareness about method of preparation of ORS	35	97	38	97	.95
Awareness of the correct SIGNS to refer a child	25	69	18	46	.04
Awareness of correct dosage of paediatric IFA to be given to a child	7	19	3	8	.13
Awareness of correct frequency of paediatric IFA to be given to a child	22	61	7	18	.001

TABLE 4: HOME VISITS BY ASHAS

Indicators	Intervention Districts		Control Districts		p-value
	N*	%	N*	%	
Receipt of HBNC+ visit by ASHA when child turns 3 months of age by women with children of age 3-23 months	1053	84	396	31	.001
Receipt of HBNC+ visit by ASHA when child turns 6 months of age by women with children of age 6-23 months	835	78	245	23	.001
Receipt of HBNC+ visit by ASHA when child turns 9 months of age by women with children of age 9-23 months	597	69	175	20	.001
Receipt of HBNC+ visit by ASHA when child turns 12 months of age by women with children of age 12-23 months	326	60	83	15	.001
Receipt of all the four HBNC+ visits by ASHA	250	46	67	12	.001
Receipt of ORS from ASHA for women with children of age 6-23 months	621	58	373	35	.001

*The denominator for each indicator would vary, based on the target group for which it was calculated, as mentioned in indicator description

TABLE 5 KEY CHILD CARE PRACTICES

Indicator	N*	Intervention (%)	N*	Control (%)	p-value
Exclusive breastfeeding practices					
Exclusive breastfeeding rate for infants of current age 0-5 months	304	73	281	65	.01
Exclusive breastfeeding rate at 3 months	45	71	49	68	.67
Exclusive breastfeeding rate at 4 months	41	63	40	56	.42
Exclusive breastfeeding rate at 5 months	28	52	23	36	.09
Complementary feeding practices					
Receipt of complementary feeding for children of current age 6-9 months	85	79	82	74	.08
Infants fed adequate number of times (6-11 months)	395	75	364	71	.29
Infants fed adequate number of food groups (6-11 months)	395	75	369	72	.35
Immunization					
Full immunization (12-23 months)	413	76	461	83	.09
Handwashing Practices					
Mothers washing their hands in the last one day:					
After defecation by self	1233	83	1275	85	.89
After cleaning the child after defecation	1144	77	1185	79	.80
Before preparing food	1055	71	1050	70	.93
Before eating	981	66	915	61	.86
Before feeding the child	594	40	570	38	.88
IFA Supplementation					
Administering of by-weekly IFA supplement in the last two weeks (6-23 months infants)	364	34	107	10	.0001
ORS Usage					
Diarrhoea occurrence in past 2 weeks (6-11 months)	63	12	62	12	.90
Receipt of ORS during episode of diarrhoea (for those who had diarrhoea in past two weeks)	34	52	32	51	.92
Growth monitoring					
Index child weighed (age 0-23 months)	743	50	285	19	.001

TABLE 6 LOGISTIC REGRESSION FOR KEY CHILD PRACTICES

	AOR	
	Intervention	Control
Current exclusive breastfeeding	1.56(1.14-2.13) **	Ref
Infants fed adequate number of times (6-11 months)	1.40(1.03-1.89) **	Ref
Infants fed adequate number of food groups (6-11 months)	1.09(.81-1.47)	Ref
IFA consumption in last two weeks	4.30(3.35-5.51) ***	Ref

Figures

FIGURE 1 MULTISTAGE SAMPLING DESIGN

