

Integrated approach for survival and development during first 1000 day of life: Assessing Health Systems Readiness in three Aspirational Districts of Jharkhand (India)

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Abstract

Introduction: With increased evidence of the association between early child-rearing practices and children's health, growth, and development, the government of India has introduced several policies and strategies, of which the home-based care for young child (HBYC) is the most recent. An assessment was conducted in three aspirational districts in Jharkhand to see system preparedness for implementation of the program.

Material & Methods: Eight district key health personnel from 3 districts were interviewed on health systems readiness components. A total of 100 Sahiyas (Accredited Social Health Activists) and 100 mothers were selected across 8 villages in 2 blocks in each of the 3 districts of Lohardaga, Simdega, and West Singhbhum, and interviewed with a structured questionnaire on knowledge and practices. In addition, 24 auxiliary nurse midwives, Sahiya Sathis, and Anganwadi workers were interviewed. Data collection teams underwent an orientation.

Results: Most nodal persons were recruited; however, orientation to HBYC and awareness of key components such as incentives, supervision mechanism, and monitoring indicators was lacking. Supply of prophylactics and equipment was inadequate. Knowledge of community health workers was inadequate for many child care indicators except Oral Rehydration Salt (ORS) preparation (96%) and initiation of complementary feeding (97%). Knowledge of danger signs requiring referrals was particularly low (30%). Mothers' knowledge and practices were low on all the indicators.

Conclusion: The HBYC program can build its success on the present health system functioning by tailoring trainings to focus on gaps in knowledge, addressing specific gaps in supplies, improving supervision, and integration efforts

Keywords: Health system, home-based care of young child, Jharkhand

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INTRODUCTION

Adequate nutrition from conception through infancy is the foundation for lifetime brain function. Children who are not adequately nourished are at risk for failing to reach their developmental potential in cognitive, motor,

and socioemotional abilities.^[1,2] Particularly, nutritional deficiencies result in low birth weight and developmental delays,^[3] while stunting before 2 years of age is related to poor child development.^[4] In India, nutritional deficiencies

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are pervasive, particularly in low socio-economic households.^[5-7] According to NFHS 4, wasting occurs in 21% of under-five children, stunting occurs in 38.4%, while 35.8% of children are underweight.^[8] Although there has been a decline in stunting and underweight since the third round of NFHS, wasting among under 5 children has increased in India, which is concerning given that 4.4% of deaths have been shown to be specifically attributable to severe wasting.^[9] Of the 5.9 million deaths annually among under- 5 years children, approximately 35% are due to nutrition-related factors.^[10]

With increasing evidence of the strong association between nursing care and children's health, growth, and development,^[11,12] governments have committed to early childhood development programs. The Indian government made significant advances in policy and guidelines in child health and nutrition. Through the home-based newborn care (HBNC) initiative, Accredited Social Health Activists (ASHAs) were able to reach 1.1 crore children until 2017.^[13] However, their schedule put a limit to home visits to just 42 days after the birth of a child, leaving out a wide window of opportunity. A high proportion of deaths occur in the first 2 years of a child's life due to pneumonia (72%) and diarrhea (81%).^[14] Reaching children during this critical period and providing treatment and referrals at home along with counseling for age-appropriate feeding practices and water, sanitation, and hygiene (WASH) is crucial. To fill this gap and provide an integrated platform, the government of India recently launched the home-based care for young child (HBYC) program in April 2018, an integrated approach for support in the first 1000 days of children's life.

The objective of the HBYC program is to reduce child mortality and morbidity and improve nutrition status, growth, and early childhood development of young children, through structured, focused, and effective home visits by ASHAs. HBYC envisages additional 5 visits after the newborn period – at months 3, 5, 9, 12, and 15 – to all children between 3 and 15 months, with focused counseling for complementary feeding, growth monitoring, vaccination, WASH practices, and childhood sickness. It was to be implemented in all aspirational districts of India.

In Jharkhand, all the districts have been selected for initiating HBYC in FY 2019–2020, and a baseline assessment was conducted by the community mobilization cell, NHM, to assess the readiness of the health system in implementing the program. The USAID Vriddhi project team provided technical support in designing tools and guidelines for the assessment. It also supported the orientation of district

resource persons on the tools and facilitation of data collection in three target aspirational districts (Lohardaga, Simdega, and West Singhbhum). These districts, which are aspirational districts, were assigned to the Vriddhi project by the national government for the assessment. The current article reports findings from these three districts for the following objective:

- To find out the status of HBYC orientation, planning of trainings and task schedules, supplies of essential drugs and equipment, and finance
- To assess knowledge and skills of front line health workers (auxiliary nurse midwives [ANMs]), Sahiya (ASHAs as known in Jharkhand), SahiyaSathi (ASHA facilitators), Anganwadi workers (AWWs), and lady supervisor (ICDS) on nutrition and related child development information necessary for fulfilling their roles under HBYC
- To assess knowledge and practices of mothers on infant and child care practices.

MATERIAL & METHODS

A cross-sectional study was conducted among service providers through a survey method to assess the readiness of the health system for implementing and managing HBYC. Two blocks and 8 villages (4 villages in each block) were purposively selected from each district in consultation with state NHM officials. The total number of blocks was 6 and the total number of villages sampled was 24. Nodal officers for HBYC were recruited from each district. Sahiya Sathi, ANM, and AWW were selected from each village (24 villages), while one lady supervisor was selected from each block (6 blocks). The sample size for district program managers, district program coordinators, and district accounts managers (DAMs) was exhaustive. All nodal persons assigned for HBYC were interviewed – 2 district program managers (DPMs), 3 DAMs, and 3 district program coordinator (DPC), along with 24 Sahiya Sathis, 24 ANMs, 24 AWW, and 6 lady supervisors. One of the districts did not have a DPM, so two were interviewed. At least, one representative from each of the three groups of Sahiya Sathi, ANM and AWW was selected from each village. The Sahiya Sathi, ANM, and AWW were a convenience sample. As each village was visited, one each of Sahiya Sathi, ANM, and AWW – whoever was available during that day – was recruited for the interviews.

The sample size for Sahiya (ASHA) has been calculated using Sahiya's knowledge of their role in postnatal care as sample proportion (p), while for mothers, measles coverage in rural India was used as sample proportion (p).

With 80.3% measles coverage in rural India taken as sample proportion of mothers and a 95% confidence interval, an error rate set at 10%, and design effect of 1.5, the total sample size of mothers was 100 per district ($Z_{\alpha/2}^2 * p * [1 - p] / \text{MOE}^2$). Nearly 80% ASHAs knew their role in postnatal checkup,^[15] this was taken as the sample proportion, and taking the same values of the parameters as mentioned above, the sample size of Sahiyas similarly was 100 in each district.

From a list of villages for each block, 4 villages were picked randomly through a simple lottery system. The selected villages were presented to the state NHM and finalized. In each selected village, available and eligible mothers with children 3–15 months were interviewed through a random walk method. One hundred and forty-four mothers had infants in the age group of 3–6 months and 156 mothers had infants in the age group of above 6 months up to 15 months. Before each interview, an informed consent form was read out to participants and upon their agreement to participate in the study, the interview was conducted. Frontline health workers were interviewed at the block PHC and Anganwadi centers. Mother–child protection (MCP) cards and growth charts were physically verified. A total of 50 Sahiyas from each block were interviewed as per convenience.

Data collection tool was developed at state level with technical support from USAID Vriddhi project. There were 9 types of questionnaires developed for the different types of study participants. An informed consent form was developed which contained information about the study, the interview process, and risks, benefits, and confidentiality of the process. In the questionnaires, key processes for rollout of HBYC were included as indicators in district functionaries' tools, adapted from the WHO Service availability and readiness assessment (SARA) tool. Knowledge and practice questions were based on standards provided in IMNCI guidelines (MoHFW, 2019). A state-level one-day orientation of state team trainers (STTs) and DPCs from each district was held on July 9, 2019. After orientation, each district prepared two teams for data collection. Each team included 4 block team trainers (BTs) from neighboring blocks and 1 STT from the district. A Vriddhi project consultant and the state trainer interviewed district key functionaries.

The study was undertaken by the Jharkhand State NHM as part of the HBYC rollout and did not require an ethical review. Informed consent forms were prepared in accordance with the ethical principles laid down in

the Helsinki Declaration. The consent form included explanation of the study, benefits, risks, and assurance of confidentiality.

RESULTS

For assessing the readiness of the district health system, interviews were conducted with NHM officials at district level. Certain questions were common, while others were unique to the type of functionary interviewed. Tables 1-3 present the findings.

The state program coordinator is the nodal person for HBYC at state level and DPC is the nodal person at the district level. DPM has the overall responsibility of the programs. One district had not yet appointed the DPM.

One of the two DPMs and the three DPCs were aware of HBYC guidelines released by the government of India. However, none of the DPMs and DPCs were formally oriented on HBYC. Unlike HBNC, the AWWs play an important part in the HBYC program; however, there was no joint planning exercise with ICDS department for the training of AWW under HBYC and their role in the implementation of HBYC. The DPMs were aware of the specific tasks of ASHA and ANM and have established supportive supervision mechanisms. They were aware of the incentive scheme for ASHA under HBYC but not of the supervision incentive. Only one DPC was aware of monitoring indicators for HBYC. The account managers were not aware of the HBYC periodic monitoring or any budgetary provisions for it.

Table 1: Awareness, supplies, and training for home-based care for young child among district program managers

Indicators	Number of DPM
A nodal person appointed for HBYC at district level	2
DPM/DPC aware of HBYC operational guidelines	1
DPM/DPC having a copy of HBYC operational guidelines	2
DPM aware of tasks to be performed by ASHA and ANM under HBYC	2
District NHM conducted joint planning exercise for HBYC with ICDS	0
DPM oriented on HBYC	0
Districts that have identified resource centre for conducting trainings of HBYC	2
DPM/DPC aware of monitoring indicators of HBYC program	0
Districts have procured additional stock of IFA syrup for HBYC	1
Districts have procured additional stock of ORS for HBYC	1
HBYC training package available in local language	1

DPM: District program manager, HBYC: Home-based care for young child, DPC: District program coordinator, ASHA: Accredited social health activists, ANM: Auxiliary nurse midwife, NHM: National health mission, ICDS: Integrated child development services, IFA: Iron Folic Acid, ORS: Oral Rehydration Salt

Table 2: Awareness, supplies, and training for home-based care for young child among district accounts managers

Indicators	Number DAM
DAM having a copy of HBYC operational guidelines	2
DAM aware of budget proposed for HBYC in the current financial year	3
DAM aware of the recommended amount for each training batch of HBYC	0
DAM aware of recommended amount for ASHA incentive for HBYC	3
DAM aware of recommended amount for ASHA supervisor incentive for HBYC	0
DAM aware of recommended amount for HBYC monitoring	0

DAM: District accounts manager, HBYC: Home-based care for young child, ASHA: Accredited social health activists

Table 3: Awareness, supplies, and training for home-based care for young child among district program coordinators

Indicators	Number of DPC
DPC aware of HBYC operational guidelines	3
DPC having a copy of HBYC operational guidelines	3
District NHM conducted Joint planning exercise for HBYC with ICDS	0
District established any supportive supervision mechanism for HBYC	2
HBYC training package available in local language	2
Districts that have identified resource centers for conducting trainings of HBYC	2

HBYC: Home-based care for young child, DPC: District program coordinator, NHM: National health mission, ICDS: Integrated child development services

Two districts have identified a resource center for trainings, while only one district had procured additional stocks of IFA syrup and ORS. Two districts had training packages available in the local language and only one district planned Training of trainers. None of the DPCs or DAMs were aware of recommended budget for training batches.

Status of knowledge of Sahiyas and SahiyaSathis on child care practices

As the HBYC program was not yet implemented in the districts, the Sahiyas were not aware of the tasks and home visit schedule as per HBYC protocol. Regarding supplies, 70% of Sahiyas reported availability of ORS, but only 6% reported pediatric IFA syrup availability. Although a majority of them knew when to introduce complementary feeding and how often to feed, their knowledge on adequate feeding (quantity more than or equal to half bowl during each feed) was low [Figure 1]. Moreover, while 97% of them knew how to prepare ORS, only a smaller percentage knew about the dose and frequency of IFA syrup [Figure 1]. In comparison, a higher proportion of SahiyaSathis had knowledge on the dose and frequency of IFA syrup. In addition, while 75% of SahiyaSathis knew at least 3 danger signs for which referral of a child is required, only 30% of Sahiyas had any knowledge about this.

Supervision of Sahiya

Slightly more than half of the SahiyaSathis (58%) had the latest records related to supervisory visit and half (50%) had completed all the necessary tasks during their supervision visit.

Status of knowledge of auxiliary nurse midwife, Anganwadi worker, and lady supervisor on child care

ANM, AWW, and lady supervisors were asked about their knowledge on child care. In addition, functionality of the Anganwadi center (AWC) was assessed [Table 4].

In terms of functionality, it is seen that growth chart was not plotted for every child. Only 17 out of the 24 AWW reported having a functional weighing scale. As regards knowledge, all the supervisors and the majority of AWW knew about weight plotting, timely initiation of complementary feeding, and detecting SAM using a MUAC tape. The knowledge was low for correct frequency and quantity of complementary food, and knowing all the components of the National Nutrition Mission. Interestingly, a higher proportion of AWW knew the correct frequency of feeding compared to their supervisors.

ANMs were also assessed in those indicators for which their knowledge was vital to provide correct referral and treatment to young children. Table 5 captures their knowledge.

Although knowledge was high on correct initiation of complementary feeding, duration of zinc provision for a child with diarrhea, and correct ORS preparation, knowledge regarding dosage and frequency of pediatric IFA syrup and zinc dosage was low. In addition only half of them had knowledge about critical danger signs.

Status of knowledge and child care practices of mothers

As shown Figure 2, only 28% of mothers had ORS available with them. Out of the total infants who were reported having diarrhea in the last 2 weeks preceding the survey, only 33% received ORS. Out of the total mothers who had given ORS to infants suffering from diarrhea, only 29% of mothers had prepared ORS correctly. Again, only a small percentage (11%) of mothers reported washing hands-on critical times of the day (after defecation, before feeding baby, before cooking, after washing baby’s bottom). The knowledge of mothers about any two critical danger signs in infants that require referral to health facility appeared to be low (13%) [Figure 2].

Besides the above, mothers’ knowledge on breastfeeding and complementary feeding was also assessed. A majority

of mothers were practicing exclusive breastfeeding (83%). Although a majority of mothers with infants of 6–15 months age had initiated complementary food at the appropriate age, not many were giving it in the correct frequency or in adequate quantity. Besides knowledge and practices of mothers, a few other essential indicators were also assessed during home visits, i. e., the status of MCP cards and mothers’ interaction with their child. While the majority of mothers had MCP cards (98%), only 20% of infants were reported to have undergone age-appropriate vaccination, and 3% had age-appropriate weight plotted. The majority of mothers (89%) were observed to be adequately interacting: laughing, talking, and playing with their child [Table 6].

DISCUSSION

The baseline assessment was conducted to assess readiness of the health system in providing home-based care for

Table 4: Functionality of Anganwadi centers (n=24)

Indicators	(%)
AWW maintaining records of infants (0-2 years)	100
AWW maintaining length/height of every child	38
Availability of functional weighing Scale at AWC	71
Supervisors conducting monthly meetings with AWW	83

AWW: Anganwadi workers, AWC: Anganwadi center

Table 5: Knowledge of auxiliary nurse midwife on child care indicators (n=24)

Indicators	n (%)
Timely initiation of complementary feeding	24 (100)
Correct ORS preparation	22 (92)
Dosage of zinc tablet	13 (54)
Duration of zinc provision	24 (100)
Correct initiation of paediatric IFA syrup	15 (63)
Correct frequency of paediatric IFA syrup	9 (38)
Correct dose of paediatric IFA syrup	14 (58)
3 danger signs that require an infant’s referral	14 (58)

IFA: Iron folic acid, ORS: Oral rehydration salt

infants and young children. For the HBYC program to succeed and achieve end goals, certain essentials need to be in place: trained service providers, supplies and job aids, adequate supervision, and monitoring among others. Results from the assessment make it clear that improvements in training, supplies, and supervision need to be a priority for the program to achieve its goals.

At the time of the assessment, the awareness of program managers on the different aspects of HBYC was very low probably due to the newness of the program. Convergence with related programs and departments that address all the determinants of child health and development is a cornerstone of child and infant care. However, no coordination with ICDS was reported at the district level at the time. Awareness of the various components was low among key personnel. Most nodal persons were able to identify the program which is a strength. However, in other respects such as supplies, training plans, monitoring and incentive mechanisms, limitations were seen. Similar limitations or gaps were seen in other studies.^[16-19] This highlights an incomplete preparation of the current public health systems and suggests that only once a program gets implemented do all the building blocks expect to get filled. Despite a national-level orientation being conducted, the cascade of information flow to the district level was limited.

The knowledge of Sahiya, AWW, ANM, and supervisors is adequate in some issues due to previous trainings under various umbrellas, whereas in some others, it is incomplete. For example, Sahiyas knew about when to initiate complementary feeding but lacked knowledge on how frequently and how much to feed. This was seen across all levels of frontline health workers including supervisors. Although more SahiyaSathis had correct knowledge on several indicators, they perhaps failed to transfer this knowledge to

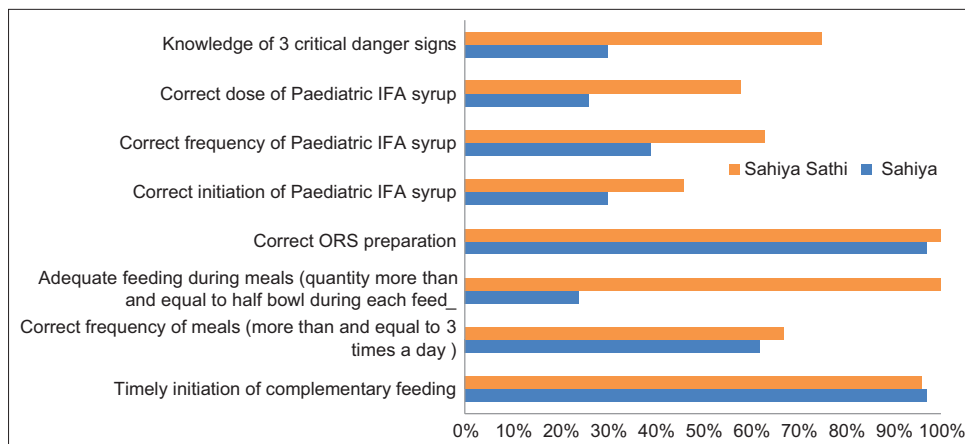


Figure 1: Knowledge of complementary feeding, ORS preparation and dose and frequency of paediatric IFA syrup among Sahiya (n = 300) and SahiyaSathi (n = 24)

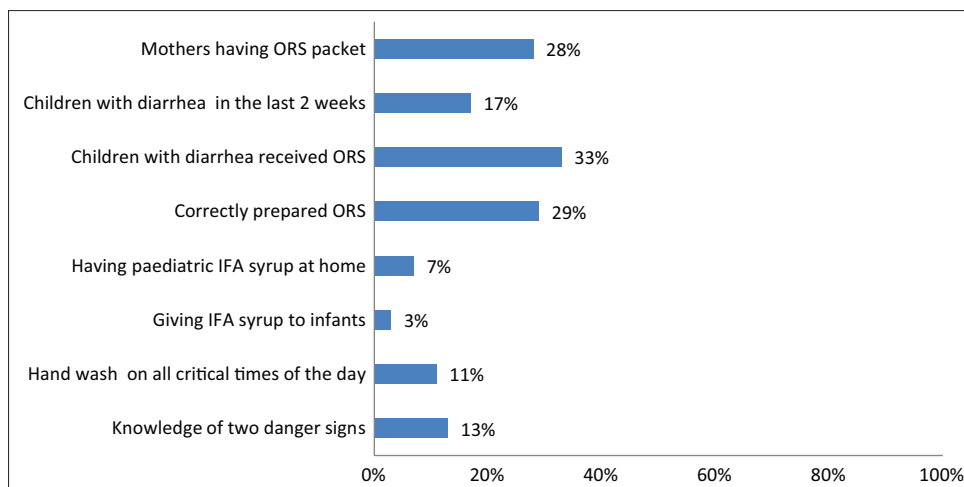


Figure 2: Percentage of mothers with correct knowledge and practice of child care (n = 300)

Table 6: Knowledge and practice of feeding among mothers and status of mother–child protection card (n=300)

	Percentage
Status of mother’s feeding practices and knowledge	
Infants <6 months receiving exclusive breastfeeding	83.0
Infants initiated with complementary feeding at appropriate age (after completion of 6 months)	70.0
Infants receiving correct frequency of complementary food during each day	23.0
Infants receiving adequate quantity of complementary food during each day	49.0
Infants receiving appropriate quality and variety of complementary food during each day	67.0
Status of MCP card	
Mothers having MCP card	96.0
Infants with age-appropriate all vaccination	20.0
Infants with age-appropriate weight plotted on growth chart	3.0
Mothers adequately interacting with infant	89.0

MCP: Mother–child protection

Sahiyas. Moreover, ANM had knowledge of the duration of zinc in case of diarrhea but not of dosage. Most Sahiyas, supervisors, and ANM also lacked knowledge of the duration and dosage of pediatric IFA supplementation. On the other hand, their knowledge about ORS preparation and exclusive breastfeeding was high. What is of concern is that knowledge of the critical danger signs requiring referrals was low among Sahiyas and half of the ANMs. Studies have shown the importance of continuous training,^[20] quality of training or competency-based training,^[21,22] and shorter duration of training^[23] in influencing the retention of knowledge and motivation and performance of community health workers. In implementing trainings on HBYC, the evidence on quality, duration, and nature of training must be considered.

Improved supervision with problem solving at its core is shown to have more effect on the performance of CHW.^[24] The results, however, show less than optimal supervision which needs to be improved. Despite maintaining records,

AWW failed to plot weights on charts. It could be due to lack of skills or due to perceived lack of importance of doing so. It is here that supervisors can handhold and monitor them.

Studies have time and again shown that inconsistent commodities and limited supplies affect CHW performance.^[25-28] The assessment showed mixed results for supplies – while ORS was readily available, only 6% of Sahiyas mentioned having pediatric IFA syrup. Similarly, not all the AWW reported having functional weighing scales. The HBYC guidelines emphasize the tasks of monthly weighing of children and recording on growth chart, alongside counseling on age-appropriate and adequate complementary feeding as well as distribution of prophylactic IFA and ORS. To perform these tasks, it is essential that supplies and commodities are available, and training and monitoring on maintaining growth charts is improved. The fact that only 28% of mothers reported having ORS and only 33% of children with diarrhea received ORS reveals the inadequate supply to the target group suggesting a more vigorous reinforcement of supplies.

Availability did not often translate into appropriate action as evidenced from the low proportion of children actually being given prophylactic IFA. Furthermore, only a small proportion of mothers were able to prepare ORS correctly, thus indicating the need for enhanced counseling.

Although home visits by CHW are associated with children receiving age-appropriate frequency of meals and initiation of complementary feeding at the right age,^[29] it may have to be more rigorously implemented through repeated reinforcement for a longer period of time to reduce undernutrition.^[30] A high number of mothers reported initiating complementary feeding. However, the number decreased for frequency and quantity of meals.

There is, thus, a need for refresher training of Sahiyas and supervisors on complementary feeding.

Limitation

A major limitation of the current assessment was that health system building blocks and inputs were assessed only through interviews with a few key district personnel and were not based on a more rigorous evaluation. Another limitation is that there may be selection bias of the sample as the random walk method is not tightly controlled. In addition, the districts were purposely selected based on poor HBNC coverage which may portray the poor knowledge assessed during the study. Assessment was conducted by the supervisory team (BTT and SIT) of the same district and the possibility of bias cannot be ruled out. The Sahiyas were a convenience sample and may not be representative of all Sahiyas.

CONCLUSION

Not all three districts were uniformly ready with supplies and trainings. While the districts had identified nodal persons for HBYC program and all of the district program coordinators were aware of HBYC operational guidelines, none of the districts yet had a joint planning exercise for HBYC with ICDS, and only one district had procured additional stock of ORS and IFA syrup. DAMs were aware of the HBYC budget but not about the incentives for supervision and monitoring. All the 24 AWWs maintained records of infants. However, only 38% maintained growth charts. Functional weighing scale was available at 71% of the Anganwadi centers, indicating that even such a basic item was not available at all the centers. In terms of knowledge, the frontline health workers had adequate knowledge on some aspects but not all. While nearly 100% ANM, Sahiya Sathis, and Sahiyas had knowledge of timely initiation of complementary feeding, the proportion decreased for other indicators such as knowledge on adequate feeding (quantity more than or equal to half bowl during each feed) and correct frequency of meals. Only 30% of Sahiyas knew about the three critical danger signs. Almost three-quarter of Sahiya Sathis knew correct dose and frequency of pediatric IFA syrup; however, only a quarter of Sahiya knew about the same. While 83% and 70% of infants, respectively, were exclusively breastfed and initiated with complementary food at the right time, 49% of them received correct quantity and only 23% received food at the correct frequency. Knowledge of mothers on correct preparation of ORS (29%), giving IFA syrup to sick infants (3%), knowledge of 2 danger signs (13%), and handwashing (11%) was low. By revealing specific gaps, inadequate supplies of pediatric IFA and ORS; training

and supervision needs of AWW, Sahiya, ANM, and Sahya Sathi; and enhanced counseling need for mothers, findings from the study can be used to improve aspects of training, supervision, interdepartmental coordination, and supplies that require the most urgent attention.

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Conflicts of interest

There are no conflicts of interest.

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