

Assessment of Home-Based Care for Young Child (HBYC) Program in Aspirational Districts of Madhya Pradesh, India: A Cross-Sectional StudyHerschel Dafal¹, Swati Saral², Anshuli Trivedi³, Siddharth Agrawal^{4*}¹Associate Professor, Department of Community Medicine, LNMCH, Indore, MP, India²Assistant Professor, Department of Pediatrics, RKMC, Bhopal, MP, India³Associate Professor, Department of Community Medicine, GMC Bhopal, India⁴Senior Resident, Department of Pediatrics, SAMC & PGI, Indore, MP, India

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Corresponding Author: Dr. Siddharth Agrawal

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Abstract:

Background and Objectives: In 2018, the Government of India launched the Home-Based Care for Young Child (HBYC) programme, which includes five scheduled home visits per quarter for children aged 3 to 15 months to enhance early childhood development. Evaluate the understanding and behaviors of Accredited Social Health Activist (ASHAs), other health workers, and mothers about HBYC. Cross-sectional assessment design with ASHAs, AWWs, ANMs, ASHA, and mothers of children aged 3 to 15 months as participants.

Material and Methods: An evaluation was conducted on the knowledge and practices of 801 ASHAs, 200 other health functionaries, and 787 mothers regarding exclusive breastfeeding, complementary feeding, hand washing, iron folic acid (IFA) and oral rehydration solution (ORS) supplementation, and danger referral signs in eight aspirational districts of Madhya Pradesh.

Results: 88% of ASHAs demonstrated accurate understanding of ORS, 85% of supplemental feeding, 85% of the adequacy of IFA, and 47% of danger indicators for child referral. 85% of moms were aware of exclusive breastfeeding, 40% knew about supplementary feeding, and just 18% knew the precise preparation of ORS. A statistically significant relationship was found between ASHAs doing home visits and the presence of ORS in households, as well as mothers' understanding of the proper initiation of IFA ($p < 0.001$).

Conclusion: The survey indicated that most health functionaries were knowledgeable of the duties, responsibilities, and critical activities associated with HBYC. There was a lack of information transmission by health workers, resulting in insufficient implementation of behaviors among mothers regarding HBYC. This requires implementing relevant measures ranging from enhancing the health system to creating capacity in order to speed up the adoption of the HBYC programme.

Keywords: ASHA; Child health; Feeding practices; HBYC; Home visits.

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Introduction

Over the last thirty years, there has been significant advancement in child health worldwide, resulting in improved survival rates for millions of children. Childhood mortality continues to be elevated and is a significant issue in emerging nations. [1]

India accounts for 20% of worldwide under-five mortality. [2,3] The National Family Health Survey (NFHS 5) revealed that fewer than 12% of children aged 6-23 months had a sufficient diet, around 36% of 12-month-old children are fully immunized, and over 67% of children under five years old are anemic. [3-5] The country has had a gradual decrease in child mortality rates [2] mostly as a result of socio-demographic differences, malnutrition, inadequate sanitation, limited access to healthcare facilities, and low literacy rates. [3] The National Health Policy (NHP) 2017 of India

aims to achieve the maximum level of well-being and health for everyone, especially young children. [6] This involves the delivery of home-based health care by healthcare workers to support the healthy development and growth of newborns and children. [7]

In 2011, the Government of India (GOI) initiated the Home-Based Newborn Care (HBNC) programme to promote the well-being of infants and young children. ASHAs carried out house visits for up to 42 days as part of the programme. Nevertheless, there was still a lack of communication between newborns and health care providers after the initial 42-day period. [8]

The intervention: HBYC program

In 2018, the Government of India initiated the Home-Based Care for Young Child (HBYC) initiative to fill gaps in the HBNC scheme and enhance the relationship between the health service and children aged three months to two years. The programme aims to reduce children mortality by promoting child nutrition, immunization, and hygiene habits to avoid prevalent childhood illnesses. [9]

Below are the main services provided under the HBYC programme:

Child development

1. Proper play and communication for children based on their age.

Nutrition

1. Exclusive breastfeeding
2. Adequate complementary feeding
3. Breastfeeding up to two years of age
4. IFA supplementation
5. Promote use of fortified food.

Child health

1. Complete vaccination for children
2. Routine growth monitoring
3. Proper use of Oral Rehydration Solution (ORS) for treating diarrhea
4. Prompt seeking of medical attention when ill.

Wash

1. Proper hand hygiene techniques.

The HBYC programme has been implemented in eight districts in Madhya Pradesh: Badwani, Damoh, Chhatarpur, Guna, Khandwa, Rajgarh, Singrauli, and Vidisha. These districts have been designated as "aspirational districts" by NITI Ayog, Government of India, because of their low health and development indicators. [10]

HBYC comprises a series of five organized home visits at the third, sixth, ninth, 12th, and 15th months by ASHAs for all children who are three months old.

ASHAs offer counseling to mothers on exclusive breastfeeding, hand hygiene practices, immunization tracking, and development chart charting, identifying danger indications, and referring unwell babies to health institutions. [11]

Children between three months and two years old are assigned extra responsibilities, including initiating supplemental feeding promptly, administering oral rehydration solution (ORS) and iron folic acid (IFA) syrups, participating in suitable play and communication activities, and recognizing and directing underweight children to appropriate care. Health functionaries within the

HBYC programme are now carrying out the following main tasks:

ASHA at third month visit

1. Endorsement of exclusive breastfeeding
1. Provide guidance on hand hygiene protocols
2. Suitable play and conversation
3. Verify immunization status
4. Supervise weight documentation.

ASHA at ninth, 12th, and 15th month visit.

All the above activities plus the following:

1. Provide guidance on introducing supplemental feeding while maintaining nursing
2. Providing suitable and sufficient supplemental feeding for children of the right age
3. Play and communication suitable for the child's age
4. Ensure complete immunization
5. Dispensing and advising on preventive iron-folic acid and oral rehydration salts.

AWW at third month visit

1. Monthly assessment of infants' weight
2. Utilizing a growth chart for plotting
3. Detect children that are underweight and implement necessary measures
4. Advise the woman to exclusively breastfeed.

AWW at ninth, 12th, and 15th month visit

1. Distribution of "Take Home Ration"
2. Nutritional guidance for the mother
3. Guidance on supplemental feeding
4. Monitoring growth and noting weight on growth chart
5. Identify underweight children. 6. Provide counseling for deworming children over 1 year old.

Aim and Objectives: This study reports the results of an evaluation carried out with healthcare providers and mothers of children who were 3 to 15 months to examine the knowledge and practices related to HBYC.

Material and Methods:

Study design: This study utilized a cross-sectional evaluation approach.

Study participants: The study included Accredited Social Health Activists (ASHAs), Anganwadi Workers (AWWs), Auxiliary Nurse Midwives (ANMs), ASHA facilitators, and eligible mothers who had children aged 3 to 15 months.

Sample size and sampling: Data collecting was conducted in all eight aspirational districts of Madhya Pradesh. The community served as the principal sample unit (PSU) for this study.

Therefore, two random blocks were chosen from each district, and four villages with the largest population from every selected block have been included in the sample. It signifies that there are eight villages in each district and a total of 64 villages throughout all eight aspirational districts were considered.

The sample size for ASHAs was determined based on their rated knowledge level (80.3%) from prior research, [12] with a 95% confidence range, 10% non-response rate, design effect of 1.5, and desired accuracy of $\pm 10\%$. The sample size for mothers was determined based on the immunization coverage of children (83.3%) according to NFHS 4, [13] resulting in a total sample of 102 ASHAs and 103 moms per intervention district. The total was rounded to 100 for every category and split evenly between two randomly chosen blocks per district, with each block treated as a cluster.

Four participants from each group (ANMs, AWWs, and ASHA facilitators) per block were selected for the sample due to time constraints and operational viability of data collection. The research locations and participants were selected using a multistage cluster sampling procedure. Initially, two blocks were chosen randomly from each district, followed by the selection of four villages from each block with the largest population.

The research participants were chosen by cluster sampling. The entire sample size of ASHAs along with other health professionals was evenly distributed between the two blocks; whereas the sample size of mothers was evenly distributed among eight villages each district (four villages per block). Fifty ASHAs each block were chosen from primary health centers near block headquarters, while ANM, AWW, and ASHA facilitators, a total of four from each category per block, were picked via convenient sampling. Interviews were done with 100 selected at random mothers at their homes.

Data collection tools and process:

An assessment method customized for each group of participants was created by a team of specialists in neonatal and child health. The tools were tested

and validated at a non-intervention location after creation, and adjustments were made before data collection. Relevant questions were provided for health functionaries (ASHAs, AWW, ANM, and ASHA facilitators) based on their roles and duties outlined in HBYC. The study evaluated the presence of Mother and Child Protection (MCP) cards, ORS packets, and IFA syrup with mothers, together with their knowledge and habits on hand washing, immunization, growth tracking, and recognizing danger indicators.

Four teams, each including four independent investigators, were selected by the state National Health Mission (NHM) administration to conduct the data collecting. ASHAs from each block were questioned in the block office, while other health workers were interviewed at their assigned locations. The moms were interviewed in their own houses. Prior informed permission was acquired from everyone who participated, and their confidentiality was maintained during data collection.

Results

8098 ASHAs, 60 ANMs, and 480 ASHA facilitators were trained in eight aspirational districts of Madhya Pradesh. The study evaluated the knowledge and behaviors of 801 ASHAs, 60 ANMs, 68 AWWs, 72 ASHA facilitators, and 787 mothers.

Knowledge and practices of ASHAs: 79% of Accredited Social Health Activists (ASHAs) were found to be undertaking organized house visits, as per the survey. Approximately 82% and 77% of ASHAs had sufficient supplies of ORS and IFA syrups, with 88% and 85% possessing accurate knowledge of the appropriate dosage and frequency for ORS and IFA supplementation, respectively. Approximately 85% of ASHAs demonstrated sufficient understanding of starting supplemental feeding at six months, however only 34% were aware of the appropriate meal frequency per day. Only 47% of ASHAs were aware of at least three danger indicators for the referral of a child, and only 14% of ASHAs had actually sent ill children to a healthcare institution in the past three months. [Table 1]

Table 1: Knowledge and practices of ASHAs under HBYC

Key indicators on ASHAs knowledge and practices	Frequency (n = 801)	Percentage (%)
Performing organized house visits according to HBYC guidelines	634	79
Receiving quarterly monitoring visits from ASHA facilitators	657	82
Accurate understanding of the ORS preparation technique	705	88
ASHAs with access to Oral Rehydration Solution (ORS)	657	82
Accurate understanding of when to start supplemental feeding	681	85
Accurate understanding of the appropriate meal timing throughout the day	272	34
Accurate information on the appropriate timing for starting pediatric iron and folic acid syrup	681	85

ASHAs who have access to pediatric iron and folic acid syrup	617	77
Understanding of a minimum of three warning indicators that necessitate the referral of a child to a healthcare facility	352	44
ASHAs have directed any unwell kid to a healthcare institution during the past three months	112	14

Knowledge and practices of mothers:

Approximately 69% of moms stated that they had received age-appropriate structured home visits from ASHAs.

89% of mothers had MCP cards, whereas 53% had ORS syrups and 39% had IFA syrups. Only 18% of moms had accurate understanding about ORS preparation. It was shown that 85% of newborns are exclusively breastfed, while only 40% and 28%

receive timely beginning and correct frequency of supplemental feeding, respectively. Over 40% of mothers were seen consistently exercising hand hygiene at key points throughout the day, including after using bathroom facilities, before cooking, before feeding their child and after changing the baby's nappy. Moreover, the immunization rate was just 48%, and merely 34% of mothers were knowledgeable about at least two risk flags for a child to be referred. [Table 2]

Table 2: Knowledge and practices of mothers on HBYC

Key indicators	Frequency (n = 801)	Percentage (%)
Mothers with MCP card	700	89
Mothers possessing ORS packets	417	53
Mothers preparing ORS accurately	142	18
Mothers administering iron and folic acid syrup to eligible newborns at home	307	39
Mothers practicing hand hygiene consistently	323	41
Mothers understanding the need of exclusive breastfeeding	669	85
Mothers being aware of the timely introduction of supplemental feeding	314	40
Infants administered vaccinations suitable for their age	378	48
Mothers who are aware of at least two risk indications that necessitate referral	268	34
Mothers engaging in appropriate play and communication with newborns (ECD)	614	78

A chi-square test was used to assess the relationship between mothers' understanding of essential child health practices and home visits by ASHAs. The results indicate a strong correlation ($p < 0.001$) between the presence of ORS and a mother's accurate understanding of when to start giving pediatric IFA syrup. [Table 3]

Table 3: Association between mothers' knowledge on key child health practices and HBYC home visits by ASHAs

Indicators	HBYC home visits by ASHAs				P-value	
	Received	Not Received	NR/NA	Total		
Use of ORS	Correct	94	17	-	111	0.064 (NS)
	Incorrect	43	16	-	59	
	Total	137	33	617	787	
ORS availability with mother	Yes	340	17	-	357	<0.001 (S)
	No	189	74	-	263	
	Total	529	91	167	787	
Initiation of pediatric IFA	Correct	236	28	-	264	<0.001 (S)
	Incorrect	224	70	-	294	
	Total	460	98	229	787	
Initiation of complementary feeding	Correct	257	67	-	324	0.166 (NS)
	Incorrect	227	44	-	271	
	Total	484	111	192	787	

NR – Non Respondents, NA – Not Applicable, NS – Not Significant, S - Significant

Knowledge and practices of other health functionaries:

ANMs: The ANMs examined demonstrated sufficient knowledge on timely beginning of

supplemental feeding (85%), right preparation of ORS (90%), and accurate administration of zinc tablet (77%). Most Auxiliary Nurse Midwives (ANMs) was aware of the need of timely introduction (82%) and correct dosage (80%) of pediatric Iron and Folic Acid (IFA) supplementation.

Knowledge of at least three danger indications necessitating a child's referral was very low at 27%.

AWWs: 85% of Assistant Wildlife Wardens were keeping records, and 79% were tracking the length and height of youngsters. 80% of Auxiliary Nurse Midwives (AWWs) demonstrated accurate understanding of growth charts, while 85% were capable of identifying severe malnutrition. They were 90% knowledgeable about the timely beginning of supplemental feeding and 72% knowledgeable about the optimum frequency of complementary feeding. Only 47% of Accredited Social Health Activists (AWWs) were able to state the right quantity needed for each meal.

ASHA Facilitators: It was shown that while 71% of ASHA facilitators were educated in HBYC, only 57% were fulfilling all necessary activities during supportive supervision visits. 93% of ASHA facilitators were knowledgeable of the timely commencement, frequency, and right dosage of pediatric IFA syrup, with percentages of 97% and 94% for each aspect, respectively. Around 85% of ASHA facilitators were knowledgeable of the prompt introduction of supplemental nutrition. Only 53% were aware of the accurate frequency and quantity, which was 38%. [Table 4]

Table 4: Knowledge and practices of ANM, AWW, and ASHA facilitators on HBYC

Knowledge of ANMs on HBYC	Frequency (n = 60)	Percentage (%)
Early introduction of solid foods	51	85
Proper ORS preparation	54	90
Zinc pill dosage	46	77
Prompt start of pediatric iron-folic acid syrup	49	82
Appropriate dosage of Iron and Folic Acid syrup	48	80
Identify a minimum of three warning indicators for referring infants.	16	27
Knowledge and Practice of AWWs on HBYC	Frequency (n = 68)	Percentage (%)
Recording data about infants aged 0-2 in their locality	58	85
Understanding how to plot weight on a growth chart in an MCP card.	54	80
Keeping track of the length and height of neonates based on their age.	54	79
Expertise in identifying children with acute malnutrition	58	85
Understanding the importance of starting supplemental feeding at the appropriate time	61	90
Understanding the appropriate timing for introducing supplemental feeding	49	72
Understanding the appropriate amount of supplementary feeding	32	47
Knowledge and Practice of ASHA Facilitators on HBYC	Frequency (n = 72)	Percentage (%)
Understanding the need of promptly starting pediatric iron-folic acid syrup	67	93
Understanding the appropriate dosage frequency for pediatric IFA syrup	70	97
Understanding the appropriate dosage of pediatric iron and folic acid syrup	68	94
Information about Oral Rehydration Solution (ORS) preparation	70	97
Understanding the importance of starting supplemental feeding at the appropriate time	61	85
Understanding the appropriate frequency of supplemental feeding	38	53
Understanding the appropriate quantity of supplemental feeding	27	38
Ensure all essential activities are accomplished during supporting supervision visits	41	57

Discussion

The HBYC programme design enhances the health system's interaction with newborns and infants throughout the crucial first 1000 days of their lives to enhance nutrition via encouraging infant and young child development (IYCD) practices and providing a proper diet. [14,15]

Only 52% of ASHAs in the eight aspirational districts were trained according to the training objective established by the state NHM in fiscal years 2019–20 and 2020–21.[16] Training ASHAs on HBYC procedure is essential for the program's

overall design. Hence, it is crucial to revise tactics and accelerate the ASHA training process to ensure the efficient execution of the HBYC programme. Our findings indicate that 82% of ASHAs interviewed during the evaluation were trained in HBYC, whereas 79% of ASHAs were following the HBYC operational requirements by conducting organized house visits at certain intervals. In 2019, a comparable assessment in Bihar, Rajasthan, and Jammu & Kashmir found that just 6% of ASHAs were doing the organized visits. [17] Despite the high proportions in Madhya Pradesh, a system is required to guarantee that every eligible mother-

baby pair receives all planned visits by ASHAs in order to achieve the program's goals. Our study indicates that 88% of Accredited Social Health Activists (ASHAs) and 97% of ASHA facilitators and Auxiliary Nurse Midwives (ANMs) were knowledgeable about ORS packets and proficient in explaining the right methods for preparing an ORS solution. Previous assessments showed that ASHAs had strong knowledge ratings about ORS. [18,19]

We also evaluated the accessibility and awareness of qualified mothers on ORS utilization. On the day of the interview, only 53% of mothers had ORS packets, and just 18% knew the precise process of ORS preparation. These results emphasize a significant deficiency in the dissemination and communication of knowledge regarding ORS preparation to mothers, despite the ASHAs having a high level of understanding and sufficient availability of ORS packets. Previous assessments in similar environments have demonstrated comparable limited understanding and behaviors among moms in terms of preparing ORS. [20,21]

Infants should be exclusively breastfed for the first six months, and then continue breastfeeding along with supplementary meals until two years of age. [22] Our study found that over 80% of health workers have sufficient information regarding exclusive breastfeeding and proper introduction of supplemental feeding. Our study validates the results of prior assessments carried out to evaluate their expertise in several locations in India. [23] Only 40% of women in our research demonstrated sufficient understanding of the timely introduction of supplemental feeding. This ratio is comparable to the average of Madhya Pradesh state (39.5%) as reported in NFHS 5 for children between 6 and 8 months old who are consuming solid or semi-solid meals. [13] One notable discrepancy in our results compared to NHFS 5 was related to the level of child immunization. 48% of children had age-appropriate vaccines, compared to 77% according to NFHS-5. [13]

Our survey found that over 80% of health officials were knowledgeable about the timely beginning, precise frequency, and dose of IFA syrup. Another study confirmed our results on the appropriate dosage of IFA syrup. However, their discovery that only 34.21% of ASHAs were aware of the recommended frequency of IFA syrup is lower than our findings. [24] Only 40% of moms surveyed stated that they washed their hands at all crucial moments during the day. The numbers in this study are lower than those reported in a prior review, when 80% of women washed their hands after defecation, 45% before cooking, and around 41% before feeding their child. [25] Understanding warning symptoms and promptly transferring a sick kid to advanced medical facilities is crucial for

improving the chances of survival. Delay in recognizing danger indications of child diseases at home causes subsequent delays at all other stages. [26] A significantly inadequate understanding of danger indications was seen among ASHAs (44%), ANM (27%), and mothers (34%) in aspirational areas of Madhya Pradesh, potentially leading to baby mortalities.

Conclusion

The analysis shows that a significant number of healthcare providers have not received HBYC trainings as per the state's aim. The execution of programme activities at the field level, such as the quality of house visits carried out by ASHAs, is also determined to be below the ideal level. The programme aims to provide the best possible care for each infant within the community.

Although health officials had a reasonable level of programme understanding, there was a gap in transferring information and skills to the final recipients. The state mandates a reassessment of the current implementation strategy, pinpointing crucial obstacles, creating tailored district-level action plans, and carrying out regular evaluations to accomplish the desired results of the HBYC programme.

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