



Research Article

Infant and Young Children Feeding (IYCF) awareness among tribal mothers and health workers – Community-based cross-sectional observational surveys

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ABSTRACT

Better community Infant and Young Children Feeding (IYCF) practices are the key to improvement for childhood undernutrition. Community Health Workers (CHWs) would hold an important position for counselling and educating mothers about ideal IYCF practices, particularly in the resource-poor tribal community, where other modes of communication may be limited. In this community-based cross-sectional observational study, we simultaneously assessed knowledge of various aspects of IYCF among mothers, whose infants are younger than 15 months of age, and community health workers, who are officially designated for IYCF counselling, within the tribal community of Gujarat. The CHWs held overall good knowledge of IYCF. 90% of CHWs were aware of early initiation of breastfeeding within one hour of life, while only 37% mothers had this knowledge. 80% of CHWs agreed that 6-8 months being ideal age of starting complementary feed, and mothers' awareness of the same was 56%. The CHWs had better knowledge on breastfeeding parameters, while their understating on complementary feeding still had scope for improvement, particularly concepts of food diversity, quantity and consistency. Despite having good knowledge of IYCF among CHWs, why their knowledge is not optimally transferred to the beneficiaries is a matter of concern and needs immediate attention.

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INTRODUCTION

India continues to bear the highest global burden of undernutrition, with one-third of the stunted under-five children worldwide. [1] When India's first National Family Health Survey (NFHS-1) was conducted in 1992, the prevalence of stunting and underweight was about 50%, which has reduced to around 35% in NFHS-5 during 2019-20. [2,3] This rate of reduction is slow and not in pace with the country's impressive economic growth. Moreover, within the country, the prevalence of undernutrition is unequal and focused within certain geographical and socio-economic groups. [4,5] The tribal community is one such group. The rate of stunting among the tribal children is 42% against the overall rate of 35% in children under five. [1] Earlier, it was found that the rate of underweight among tribal children was 54% against 34% in the general population. [6] Undernutrition is responsible for around 45% of under-five mortality directly or indirectly, and has long-term cascading effects even in adulthood with trans-generational transmission. [4,7,8]

Optimal nutritional practices during the first 1000 days of life (from conception to 2 years of age) are crucial to breaking this vicious cycle.[9,10] World Health Organization (WHO) has outline the ideal Infant and Young Children Feeding

(IYCF) practices upto 2 years of age and defined the key indicators. [11] The indicators for breastfeeding (BF) include, early initiation of breastfeeding (EIBF) within one hour of birth, giving colostrum, no pre-lacteal feed, exclusive breastfeeding up to six months of life, and continuation of breastfeeding up to two years of life. The complementary feeding (CF) indicators are the timely introduction of complementary feed at 6-8 months of life, appropriate frequency and quantity at different age bands, inclusion of diverse food types, optimal consistency and energy density to meet the criteria of Minimum Dietary Diversity (MDD), Minimum Meal Frequency (MMF), and Minimum Acceptable Diet (MAD). The Government of India has also formulated a policy on IYCF that incorporates WHO's indicators with local and cultural contexts. [12] Similar to nutritional indicators, the rate of improvement in IYCF indicators is also slow over time. The rate of EIBF within one hour of life between NFHS-4, 2015-16, and NFHS-5, 2019-20 is the same at 41.8%. Though the practice of exclusive breastfeeding improved at 63.7% from 54.9% between the two surveys. Marginal improvement in the time of introduction of complementary feed at 6-8 months of life to 45.9% from 42.7%, and infant receiving adequate diet between 6-23 months of age to 11.3% in NFHS-5 from 9.8% in NFHS-4. [3] It was proven that following optimal IYCF practices alone can reduce under-five mortality up to 19%. [13]

Various Community Health Workers (CHWs), specifically, Accredited Social Health Activists (ASHA), Anganwadi Workers (AWW), and Auxiliary Nurse Midwifery (ANM), are in an important position to counsel the ideal IYCF practices to mothers and family members, particularly in the rural-tribal areas where other means of information and communication may be limited. It was observed that nutritional advice from health professionals, including AWW, and exposure to media were strongly correlated with improved IYCF practices. [14] Earlier, different studies have assessed the perception, knowledge or practice of IYCF among the community mothers or among the health workers independently. [15,16] We attempted to parallelly assess knowledge of IYCF among the mothers and health workers from the same community and geographical area. An extensive, multi-stage, community-based research project was carried out in the tribal Dahod district of Gujarat during 2015-16, with the Indian Council of Medical Research (ICMR) grant. The current paper was part of it.

Objectives: The primary objective of this paper was to assess knowledge on various aspects of Infant and Young Children Feeding (IYCF) among participant mothers and community health workers (CHWs) and to understand its nuances. Secondly, we assessed perceived information need and information source among participant mothers.

METHODS:

Study design: Two community-based cross-sectional surveys. We would name the survey among the participant mothers as Survey 1, and the survey among the CHWs as Survey 2 for ease of description in the subsequent sections.

Study area and population: Dahod is a resource-limited district, located in the eastern part of Gujarat, sharing an interstate border with Rajasthan and Madhya Pradesh. The district has a significant tribal population, up to 85-90% in its rural area. Three blocks of the district, namely, Dahod, Jhalod, and Limkheda, were chosen for participant selection with the advice from the Chief District Health Officer (CDHO), believed to have challenging outreach maternal and childcare activities.

Study participants: Participants for survey 1 were the mothers, who had their youngest living child aged less than 15 months at the time of the survey. Mothers or infants with serious, debilitating illness or psychosis were excluded. CHWs, namely, Accredited Social Health Activists (ASHA), Anganwadi Workers (AWW), and Auxiliary Nurse Midwifery (ANM) were selected for the survey 2 from the same study area, who would be officially responsible for IYCF and nutritional counselling in the community. Written consents were taken from all the participants after explaining to them the study goal and procedures, and all the necessary permissions were obtained from the district health authority.

Sampling Methods: For survey 1, 35 villages were selected out of the three blocks from the village list available at the CDHO office by simple random sampling. A list of mothers who had delivered within a pre-defined time frame was made available with the primary health centre (PHC), sub-centre, or Anganwadi Centre (AWC) catering for those selected villages. Out of the list, every third mother was selected with systematic random sampling. Eligible CHWs, working in the selected three blocks, were contacted and enrolled purposively based on their availability and consent for survey 2.

Sample size estimate: Considering the proportion of EIBF at 40% based on the NFHS-5 data sheet for Dahod district [17] with an absolute precision of 5% and 95% confidence interval, the minimum sample size is 369 for survey 1. We could enroll 480 mothers, giving us a better confidence interval at 97%. Considering the knowledge of EIBF among AWW at 95% from the past study [18] with absolute precision at 5% and 95% confidence interval, the minimum sample size is 73 for survey 2. We enrolled 132 CHWs, giving us a better confidence interval at 99%.

Data collection tools: Separate tools were devised for both surveys, as the participant categories were different. Questionnaires were internally validated among the investigators and cross-checked by the experts working in the field of public health, but not part of the investigator team. Both questionnaires were pre-tested among the targeted population, who are not part of the survey, before the final version was used. The investigator team devised questionnaires in English, translated them into a vernacular language for data collection and re-translated them into English during data entry. At each stage, a consistency check was done.

Data collection method and quality control: The data were collected by a team of surveyors, mainly psychologists. Surveyors were trained by the investigators in a two-day workshop. For survey 1, surveyors were accompanied by the local healthcare workers from the same community for ease of communication and trust building. At the participants' time of convenience, the surveyor would reach to their home. Grandmother or other family members were allowed to answer if the participant mother did not remember the information or did not understand the questions. Survey 2 was usually conducted at the workplace of CHWs, at their given time, so that their routine work would not be hampered. The surveyors were given sets of probing questions when the answers to the primary questions did not fit the pre-defined answer categories. In some instances, surveyors were allowed to record the answers as it is, as said by the participants in the 'other' category, and later analysed by the investigators. The data collection was done on tablet devices using the mobile-based data collection platform MAGPI. Surveyors were instructed to recheck the filled form before leaving the place to rectify any discrepancies. Surveyors could contact the investigator in case of doubt. Investigators also regularly checked the filled-out questionnaires and feedback provided.

Statistical analysis: The data were transferred to Microsoft Excel from the tablet-based platform in different sheets for each section and named accordingly. The data file contained the study participants' details in a row and variables in a column. Most of the data was collected categorically at the time of the survey. Scrutiny checks and data cleaning were done using range and consistency checks before the assessment. Descriptive data analysis was done to understand population characteristics. Continuous variables were displayed in Mean(SD) for normally distributed data and Median-Range for skewed distributions. Categorical variables were displayed in proportion and frequency(%). Statistical analysis was performed using the Excel software of Microsoft for Windows 11.

Ethical approval: The study was approved by the Institutional Ethics Committee-2 of H M Patel Centre for Medical Care and Education, Bhaikaka University, Karamsad. The consent was obtained from the participants for both surveys after explaining the procedure of the study, their roles and its outcome.

RESULTS:

After thorough checks, data from the 480 participants were eligible for analyses for survey 1. 135(28.12%) were primi mother. The rate of institutional delivery stood good at 429(89.37%) and was equally divided among public and private facilities. Literacy rate was poor, with only about half of the participants able to read fluently. 132 community health workers (CHWs), who could have a direct role in IYCF-related counselling in the community, participated in the survey. This included 50 ASHA, 56 AWW, and 26 ANM. The participant CHWs were equally representing different levels of experience; 42(31.81%) had <4 years of experience, 40(30.30%) had 4-9 years, and 50(37.88%) were working in their roles for > 9 years. 110 (83.33%) participants attended some sort of training within the last one year. Most of the participants agreed that all, ASHA, AWW, and ANM, were responsible for IYCF counselling. Strangely, only 22(16.67%) believed doctors also might be responsible for IYCF counselling. Only around half, 74(56.06%), were aware that counselling for breastfeeding should be initiated during pregnancy.

Table 1 parallely represents the IYCF knowledge among the rural tribal participant mothers and the community health workers working in the same community. It can be clearly made out that CHWs had excellent knowledge about most of the breastfeeding parameters. Almost all the CHWs were aware that no pre-lacteal feed should be given and the baby should be breastfed immediately after birth, while the participant mother had ideas of giving jaggery/sugar water, honey, goat milk, etc. Similarly, 90%of CHWs knew about early initiation of breastfeeding within one hour, and the community awareness of the same was only 37%. Only 45% of mothers believed colostrum should be fed, against 95% of CHWs. 89% of mothers were in favour of giving plain water to infants under 6 months old during summer months, while 64% of CHWs were aware that water should also not be given to infants up to 6 months during the period of exclusive breastfeeding. Understanding about continuity of breastfeeding was diluted among both groups, with 39% of CHWs and 28% of mothers believing breastfeeding should be continued beyond 2 years of age. The time of introduction of complementary feeding at 6-8 months of age was better known by the CHWs (80%) than community mothers (56%). However, the understanding of food frequency and diversity was not different between the two groups. Although inclusion of cereals and pulses in the complementary feeding was well perceived, almost no one believed eggs and flesh could be included as a source of protein. Inclusion of fruits and vegetables was also not recognised well. When asked what dairy products can be included, most suggested the top animal milk, again, which was the wrong understanding.

Table 1: IYCF knowledge among the participant mothers and CHWs.

Characteristic	Variable	Participant mothers (N=480) Values - n(%)	CHWs (N=132) Values - n(%)
#What the baby should be fed immediately after birth?	Breastmilk	270 (56.25%)	131 (99.24%)
	Goat milk	260 (54.17%)	3 (2.27%)
	Cow/Buffalo milk	28 (5.83%)	

	Jaggery/sugar water or honey	64 (13.33%)	
	Plain water	7 (1.46%)	
When the baby should be fed breast milk for the first time after birth?	Within one hour	180 (37.50%)	119 (90.15%)
	1-6 hours	251 (52.29%)	8 (6.06%)
	6-24 hours	31 (6.46%)	1 (0.76%)
	>24 hours	15 (3.12%)	3 (2.27%)
Should you feed the colostrum (first thick, yellowish milk) to the baby?	Yes	214 (44.58%)	125 (94.70%)
	No	256 (53.33%)	5 (3.79%)
Should you feed plain water during summer to a child <6 months of age?	Yes	426 (88.75%)	44 (33.33%)
	No	45 (9.37%)	85 (64.39%)
Up to what time you should continue breastfeeding to the baby?	<12 months	91 (18.96%)	43 (32.58%)
	1-2 years	220 (45.83%)	26 (19.70%)
	> 2 years	136 (28.33%)	51 (38.64%)
When you should start semi-solid complementary food to the baby?	<6 months	146 (30.42%)	23 (17.42%)
	6-8 months	267 (55.62%)	107 (80.06%)
	>8 months	57 (11.88%)	2 (1.52%)
How many times a day 9-12 month old child should receive meals/snacks?	≤ 3	80 (16.67%)	21 (15.91%)
	≥ 4	355 (73.96%)	105 (79.55%)
#From which different food groups, a 6-12 month old child should receive meals/snacks?	Top milk/other dairy products	140 (29.17%)	35 (26.52%)
	Eggs and Flesh	3 (0.62%)	5 (3.79%)
	Fruits	56 (11.67%)	42 (31.82%)
	Vegetables	183 (38.12%)	26 (19.70%)
	Legumes	346 (72.08%)	93 (70.45%)
	Cereals	470 (97.92%)	117 (88.64%)

#A respondent could choose more than one option.

We tried to understand how the tribal mothers got the IYCF-related information. The results were discouraging. (Table 2) 77% of mothers believed they were never counselled on IYCF practices by ASHA or AWW. 90% said ASHA/AWW had no influence on IYCF-related decisions. Rather, very few 8(1.67%) of mothers knew that the Anganwadi centre also provides nutritional counselling. Though the role of Anganwadi centres for growth monitoring and vaccination was well recognised. At that time, 45% participants had either a TV or a radio at home, but only 16% of community mothers had ever heard something on IYCF on TV or radio out of the total sample. Availability of a mobile phone at home was good at 92%. It became evident during the data collection that most of their understanding of IYCF was acquired from the elder family members, mostly grandmothers of the child.

Table 2: Perceived IYCF information sources by the participant mothers.

Characteristic	Variable	Total N=480 Value n(%)
#For what purposes do/can you visit Anganwadi centre?	Growth monitoring	352 (73.33%)
	Vaccination for baby	410 (85.42%)
	Nutritional counselling	8 (1.67%)
	*THR for baby	66 (13.75%)
	THR for lactating mother	41 (8.54%)
How many times have you been counselled about IYCF practices by ASHA?	Never	372 (77.50%)
How many times have you been counselled about IYCF practices by AWW?	Never	371 (77.21%)
Do CHWs, like ASHA/AWW, play role in influencing IYCF related decisions?	Yes	41 (8.54%)
	No	434 (90.42%)
Do you have these facilities in home?	Television (TV)	211 (43.96%)
	Radio	6 (1.25%)

	Mobile phone	442 (92.08%)
Have you ever heard or seen any of the breastfeeding/complementary feeding information on radio or TV?	Yes	75 (15.62%)
	No	405 (84.38%)

#A respondent could choose more than one option. *THR – Take Home Ration

Almost all mothers reported that they would like to receive more information on IYCF practices. On inquiring what types of information they needed, 121(25.21%) mothers required different breastfeeding-related information, 268(55.83%) were liked to know about the appropriate time of starting different types of complementary foods, and 286(59.58%) were confused about the quantity and frequency of complementary food. Because more of the mothers had queries pertaining to complementary food, we attempted to learn about CHWs' understanding of some of the practical aspects of complementary feeding and its counselling (Table 3). Only 50% of CHWs explained the quantity of complementary food by showing a reference bowl. There were inconsistencies in their understanding of the consistency of complementary food, and only 15% were aware that the consistency of complementary food should be measured by tilting through a spoon or bowl. 59% of CHWs believed counselling in complementary feeding should begin at 4-6 months of age.

Table 3: CHWs' practical understanding about complementary feeding and its counselling.

Characteristic	Variable	Total N=132 Value n(%)
How do you counsel about quantity of CF?	Showing a reference bowl	66 (50.00%)
	Handfuls	16 (12.12%)
	Referring a spoon	15 (11.36%)
	Quantity as weight	6 (4.55%)
	Don't know	16 (12.12%)
#What type of diet should be given to 6-8 month child as CF?	Liquid (Dal-water, mug-water, etc.)	75 (56.82%)
	Semi-solid (soft and meshed khichdi, dal-rice)	113 (85.61%)
	Solid (rotlo, biscuit, etc.)	6 (4.55%)
Do you know that consistency of food should get thicker with increasing age?	Yes	96 (71.73%)
How would you measure consistency of food?	Tilting through spoon/bowl	20 (15.15%)
	Looking at the preparation	30 (22.73%)
	Don't know	54 (37.88%)
From which stage counselling about complementary feeding should begin?	During 4-6 months of age	78 (59.09%)

#A respondent could choose more than one option.

DISCUSSION:

The results of the current study clearly demonstrate that a huge gap existed in the knowledge of various IYCF parameters between community mothers and community health workers from the same geographical locations and during the same time frame. CHWs are usually getting robust induction and orientation training at their appointment, regular refresher in-services training and special training as the need perceived by the state health department. [18] The matter of concern here is why the knowledge gained by CHWs is not optimally transferred to the beneficiaries. A considerable gap was observed in the knowledge and practices of frontline workers on key IYCF indicators in the tribal region where undernutrition was prevalent. [16] A study from Gujarat had documented a huge contrast between AWW knowledge and their ability to empathetically counsel caregivers. AWW's disregard for taking the feeding history of children, poor active listening skills and inability to provide need-based advice were also noted.[18] Based on these findings, a paradigm shift in training was recommended where communication processes and counselling skills are at the central of the training. [18,19] Apart from the quality of counselling by CHWs, the actual coverage and utilisation are also worth discussing. Almost three-fourth mother reports they never received any IYCF-related counselling from AWW or ASHA. The role of the Anganwadi centre for nutritional counselling was very poorly known among the participants. Awareness and utilisation of nutritional supplements and health education services at the Anganwadi centre were sub-optimal. [20,21] A study from the tribal population of Gujarat had shown mass media campaign can bring positive behavioural change for IYCF practices. [22] In our study sample, around 45% had TV/radio at that time, but only 16% of the total participants had ever heard anything on IYCF on TV/radio. It's worth exploring how such targeted educational messages can be broadcast in a delightful way to increase their viewership. At that time, almost all had a mobile phone at home. During the last decade, the rapid expansion of mobile internet and smartphones, with the use of social media platforms, has opened up further possibilities for disseminating messages to the target population.

The misconception among CHWs on the introduction of cow's milk and vitamin-rich food sources was identified. [16] Our study also demonstrated parallel misunderstanding among mothers and CHWs about the inclusion of animal milk as a

complementary food, and the non-inclusion of fruits, vegetables, and eggs/flesh. The correct age of starting the complementary food was known by 87% of AWW earlier, [23] while in our sample of CHWs, it was 80%. Though the awareness of breastfeeding practices was better among CHWs, the understanding of complementary feeding still had scope for improvement. It was further evident from our study that most mothers had information needs in complementary feeding. At the same time, practical understanding of CHWs on the quantity and consistency of complementary feeds and when to start counselling for complementary feeds was limited. Perception and practice of AWW were found sub-optimal regarding frequency, quantity, and quality of complementary feeding. [24] Integrated Child Development Services (ICDS) utilisation had a limited influence on improving complementary feeding practices. [25]

Past studies showed varied results about IYCF knowledge and practices in the community. A study from the tribal community of West Bengal showed good practice of EIBF at 76%, while another study from the tribal community of Telangana showed merely 6%. [26,27] While 37.5% knowledge of EIBF in our study more closely correlates with NFHS-5 data of 41.8%. [3] Two studies had agreement on complementary feeding practices, demonstrating reasonably good practice of meal frequency but poor results on meal diversity and minimum adequate diet. [28,29] Our study also had similar results. Food frequency of ≥ 4 times was perceived better than the diversity.

The current study limits itself to cross-sectional observational data, and no analytical or causal association was carried out. The study was conducted during 2015-16, which can be considered as a limitation. But, the fact that IYCF indicators remain static and childhood undernutrition markers have rather deteriorated between NFHS-4, 2015-16, and NFHS-5, 2019-20 in Dahod district, makes it worth understanding participants' awareness of IYCF. The possibility of recall bias cannot be eliminated completely in spite of questionnaire validity checks and surveyor training. The strength of the study was that actual field data were collected, exceeding the sample size requirement to give extra confidence from the tribal community, where the problem burden was higher. Moreover, we parallelly assessed understanding pertaining to IYCF among mothers and health workers from the same community at the same time, and discussed the knowledge gap.

CONCLUSION:

A huge knowledge gap existed on breastfeeding practices between health workers and mothers from the same resource-poor tribal community, with health workers having much better knowledge. The gap in knowledge for the complementary feeding was still there but diluted, with health workers' understanding not up to the expectation on subtle functional aspects of complementary feed like food diversity, quantity, and consistency. Mother's dependence was very poor on ASHA or AWW for her IYCF information needs. The future operational research should be diverted to how such a knowledge gap can be minimised between functionaries and beneficiaries, with better utilisation of already established health promotional mechanisms and personnel like ASHA, AWW or ANM.

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