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Frontline Worker and Household Knowledge of Infant and Young Child Feeding in Bihar, India

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Bachelor of Science in Nursing

Johns Hopkins University

2012

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Abstract

Frontline Worker and Household Knowledge of Infant and Young Child Feeding in Bihar, India

By Katrina Colbourne

Introduction: Stunting, severe wasting, and intrauterine growth restriction cause an estimated 2.2 million deaths and 21% of disability-adjusted life-years for children under the age of five. Complementary feeding after six months of age is necessary as breast milk alone ceases to provide all the required nutrients that a child needs. Although complementary feeding amongst children between the ages of 6 to 24 months is critical to improve child nutrition, progress has been slow, as it has emerged as one of the most challenging and complicated issues. CARE India's Integrated Family Health Initiative (IFHI) focuses on training frontline workers (FLW) to deliver counseling messages to households (HH).

Objectives: The objectives were to 1) describe FLW knowledge and use of job aids; 2) describe HH knowledge and practices related to IYCF; and 3) to identify program gaps and recommendations for program improvements.

Methods: 28 in-depth interviews of FLWs and HHs in two high performing blocks and two low performing blocks were conducted to examine knowledge and practice of complementary feeding content and job aids. MAXQDA 11 was utilized to analyze the data through coding, segmenting, and thematic analysis.

Results: There was a significant and alarming gap between FLW knowledge of complementary feeding guidelines and job aids and HH knowledge and practice. FLWs had moderate to high levels of knowledge, except for a few inconsistencies associated with quantity, consistency, responsive feeding, and the use of job aids. HHs had low to moderate levels of knowledge for the complementary feeding content. HHs who received home visits were more knowledgeable than those who did not; however, there was a low prevalence of HHs reporting the receipt of home visits.

Discussion: Counseling messages about nutrition during home visits can increase HH knowledge, but the low prevalence of completed home visits is the main identified issue. Recommendations include motivating FLWs through regular updates of statistics and case studies, utilizing a team-based approach with a reward system, and using positive deviance amongst FLWs and HHs. Moreover, further training is recommended for the concepts of quantity, consistency, responsive feeding, and the use of job aids.

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INTRODUCTION

Child undernutrition is a devastating, yet preventable, global health issue. As major aspects of undernutrition, stunting, severe wasting, and intrauterine growth restriction cause an estimated 2.2 million deaths and 21% of disability-adjusted life-years (DALYs) for children under the age of five [1]. In Southeast Asia, approximately one third of children are underweight [2]. Although little progress has been made over the past few decades, 40% of children were underweight in India in 2005-2006 [3]. It is predicted that India will not meet its 2015 Millennium Development Goal to reduce the proportion of children younger than three who are underweight to 26% [2].

Adequate child nutrition is critical for optimal brain development. During pregnancy and the first two years of life, the brain develops rapidly, setting the foundation for appropriate cognitive, motor, and social milestones throughout life [4]. This time period is known as the "1000 day window of opportunity" because an increase in the consumption of vital nutrients significantly improves health throughout the lifespan [5]. Therefore, improving maternal nutrition during pregnancy, the practice of exclusive breastfeeding during the first six months of life, and appropriate complementary feeding from six to twenty-four months of age are key actions for addressing undernutrition in children.

Complementary feeding after six months of age is necessary as breast milk alone ceases to provide all the required nutrients that a child needs to develop properly. The World Health Organization (WHO) recommends that complementary feeding be initiated at six months of age while continuing breastfeeding with age-appropriate quantity and frequency, semi-solid consistency, safe hygiene practices, diversity of food, and

responsive feeding [6]. Despite these recommendations, only approximately twenty percent of children in India receive adequate complementary feeding [7].

Since 2010, CARE India's Integrated Family Health Initiative (IFHI), in collaboration with the government of Bihar, has targeted multiple maternal and child health issues. Emory University specifically supports CARE program initiatives that target nutrition. Although complementary feeding amongst children between the ages of 6 months to 24 months is critical to improve child nutrition, progress has been slow as it has emerged as one of the most challenging and complicated issues. Numerous factors affect child nutrition, such as affordability and access to food, access to safe water, illnesses that cause gastrointestinal disturbance, cultural practices, and sufficient knowledge [7]. CARE's intervention focuses on training frontline workers (FLW) to deliver counseling messages to households (HH). This practice aims to overcome the barrier of lack of knowledge about complementary feeding.

The objectives of this qualitative study are to 1) describe FLW knowledge and use of job aids; 2) describe HH knowledge and practices related to IYCF; and 3) to identify program gaps and recommendations for program improvements. The results will assist CARE in revising the training content delivered to frontline health workers, so that they may improve the quality of counseling messages delivered to households in Bihar.

BACKGROUND

Nutrition in India

The 2005-2006 National Family Health Survey (NFHS) in India indicates that for children under the age of 3, 48% are underweight, 43% are stunted, and 17% are wasted [8]. All three indicators illustrate the devastating effects of malnutrition. Although the World Health Organization (WHO) recommends that complementary feeding begin at 6 months, the NFHS reveals that 63% of children initiate between 6 to 8 months of age [9]. This percentage rises by the first year of life, but the data show that children are being fed inadequately in terms of diversity and frequency. The quantities of food provided, as well as the density of the foods in terms of calories are other concerning factors regarding young child feeding practices [10].

Nutrition in Bihar

As one of the poorest states in India, children in Bihar are at high risk for malnutrition. Alarming data from 1992 – 2006 illustrates that children from the wealthiest households in India achieved a 27% decline in malnutrition compared to only 6% of children from the poorest households [11]. Mothers from households with the highest incomes are more likely to follow the WHO recommendations for complementary feeding [9]. Some progress has been made amongst several Indian states, yet Bihar remains one of the states with the highest percentage of child malnutrition and greatest inequities. To compare, 21% of the wealthiest children in Bihar are underweight, while 53% of the poorest children face the same problem. Complementary feeding practices amongst the poorest households significantly contribute to the problem of child malnutrition. Even if a mother initiates complementary feeding at the appropriate age,

poverty constrains the household's ability to provide the child adequate diversity and frequency of feeds. However, more than 40% of children with a normal weight mother are still underweight [10]. Therefore, knowledge of complementary feeding and income are critical determinants of nutrition status.

Frontline Worker's Role in Nutrition

Established by the Integrated Child Development Services (ICDS), the Anganwadi Worker (AWW) works at the Anganwadi Center (AWC) providing pre-school education, food rations, immunizations, health education, and basic health care [12]. The National Rural Health Mission (NRHM) coordinates Accredited Social Health Activists (ASHAs), who also provide health education and basic health care, in addition to connecting beneficiaries to health care services. Results from the NFHS highlight the relationship between mothers receiving nutritional counseling from health workers and their actual practices. Women who ever received information about nutrition from a health worker had higher rates of proper initiation (odds ratio of 1.48), as well as adequate frequency (odds ratio of 1.29) and diversity (odds ratio of 1.55) compared to those women who did not receive information [9].

Unfortunately, certain barriers prevent households from receiving adequate nutritional information from FLWs. ASHAs do not receive salaries but are paid incentives based on how many immunizations are given and how many pregnant women are escorted to the hospital to deliver. For this reason, ASHAs focus more on the tasks in which they are paid for instead of those that do not generate income, such as nutritional counseling. Other pitfalls include inadequate nutrition education, poor training, lack of focus on children under the age of 3, and ineffective coordination between the two types

of FLWs [12]. Historically, AWWs and ASHAs have worked separately in the villages. Having two health workers in the same village that are coordinated by different departments and not encouraged to work together can result in households receiving conflicting information. Additionally, the absence of teamwork increases the individual burden on the FLW, making it difficult for her to reach all households.

CARE India Integrated Family Health Initiative

CARE India's IFHI, in collaboration with the government of Bihar and other non-governmental organizations, has been working tirelessly to improve the health of mothers and children since 2010. A core component of the program aims to increase child nutrition through complementary feeding program initiatives. As stated above, research has shown that adequate nutritional counseling is associated with proper young child feeding practices, which is why CARE focuses on the role of the FLWs. Realizing the hardships placed on each FLW, the program encourages the ASHAs and AWWs to work together through the formation of a health sub-center (HSC). Each HSC serves several AWCs, with each AWC serving one village (though in reality one AWC often serves several villages).

Through this collaboration, both types of FLWs have been provided enhanced training and will continue to be educated together at the HSC level. Various topics are discussed at each session, ranging from the health of pregnant women to the health of the child. This aspect of the program focuses on increasing the level of knowledge of FLWs about health topics, including child nutrition and on providing effective strategies for home visit counseling. WHO's recommendations for complementary feeding are addressed, which are initiation of semi-solid food after six months of exclusive

breastfeeding, adequate quantity and frequency based on age, adequate diversity of food, proper hygiene practices, and the practice of responsive feeding. Role-playing was also implemented in the training in order to build FLW confidence and equip them with strategies to overcome common issues faced in the field. At the time of data collection for this thesis, FLWs had recently completed one year of training, which covered all health topics. Additionally, a few blocks were constructing HSC buildings to serve as a working space for both the AWW and ASHA.

Another aspect of the program focuses on knowledge and use of various job aids for counseling. The katori, which is a small bowl that marks the correct quantity a child should be fed, is a job aid that is specific to nutrition counseling. Being able to actually see how much the child should be fed, especially during a demonstration with the FLW, could improve household understanding of quantity. The mobile kunji is more general and provides visual information through a flip pad that has access to a recording of a physician explaining the health information. This tool provides FLWs with portable talking points for counseling and may increase the likelihood that the household listens to the information if the physician's recording is played. The home visit planner enables FLWs to keep track of beneficiaries and home visits. After each visit, the FLW should write down any issues that emerged in order to ensure these same issues are addressed next time.

There has been progress made in terms of overall maternal and child health, but child nutrition remains a challenge, which serves as inspiration for this project.

METHODS

Study site

This thesis will analyze a subset of qualitative interviews obtained from a shared public health practicum between Katrina Colbourne and Saiza Jivani. The practicum, "In-Depth Analysis of the Perceptions, Understanding and Utilization of Complementary Feeding (CF) Content of Integrated Family Health Initiative (IFHI) Trainings and Job Aids Across Different Program Levels (District, Block, Health Sub-center, Anganwadi Center, and Household Levels) in Bihar, India," was conducted from June – August in 2013.

Lot quality assurance sampling (LQAS) data from CARE's round two program monitoring data in 2013 were used to purposively select appropriate research sites. Two specific indicators classified individual blocks within Bihar as either high performing or low performing in terms of complementary feeding. The first indicator looked at community practices, which is defined as the number of children 6-8 months receiving any cereal-based complementary food. The second indicator examined FLW practices, defined by the number of mothers with a child 6-8 months who received advice by any FLW that their child should receive age appropriate frequency of complementary feeding after completion of six months of age. Based on the district estimate obtained from previous studies, CARE provided a percentage that would serve as the decision criteria. In Gopalganj, it was 47% for community practices and 19% for FLW practices; in Khagaria, it was 13% for community practices and 25% for FLW practices. If a block met or exceeded the percentage set by CARE, then this block "passed." If a block did not meet this percentage, then this block "failed." In order to be selected for the study, the

district had to have both a high performing and a low performing block and be classified as either a high or low performing district based on how many blocks "passed."

Drawing on the expertise of CARE staff and the criteria stated above, Gopalganj was purposefully selected as a high performing district and Khagaria was selected as a low performing district. Using the indicators specified above, Hathua was identified as a high performing block and Barauli as a low performing block in Gopalganj while Parbatta was identified as high performing and Alouli as low performing in Khagaria.

Table 1: LQAS Data for Selected Blocks. Each block had a total of 19 respondents.

Indicator	**Gopalganj District (High)**		**Khagaria District (Low)**	
	Hathua Block (High)	**Barauli Block (Low)**	**Parbatta Block (High)**	**Alouli Block (Low)**
# of children 6-8 months receiving any cereal-based complementary food	14	1	6	1
# of mothers with a child 6-8 months who received advice by any FLW that their child should receive age appropriate frequency of complementary feeding after completion of six months of age	11	1	4	0

Study population and sample size

The populations of interest for this study were the frontline workers, AWWs and ASHAs, and households with children 6 – 24 months in age. The frontline workers were chosen because they are the main platform CARE utilizes to deliver counseling messages about complementary feeding to households. Households included in the study had at

least once child between the ages of six to twenty-three months because these are the months in which complementary feeding should take place. A total of twenty-eight interviews were analyzed. This included four FLW (2 ASHA and 2 AWW) interviews in each block, which equaled sixteen participants for all four blocks. Additionally, three HH interviews in each block were collected, which equaled twelve participants for all four blocks.

Table 2: Interviews by Block

	Gopalganj		**Khagaria**		**Total**
	Hathua	**Barauli**	**Parbatta**	**Alouli**	
Number of FLW	4	4	4	4	16
Number of HH	3	3	3	3	12
Total	7	7	7	7	**28**

Design of research tools

In collaboration with CARE and Emory, in-depth interview guides were developed to assess perceptions, understanding and utilization of complementary feeding content. The guides were translated into Hindi, which was the most common language understood by the people in Bihar. Interview guides were revised after pilot interviews and throughout the fieldwork experience.

Identification and recruitment of participants

Initially, a top-down approach was utilized for recruitment as the regional outreach officer (ROO), block coordinator (BC), and health sub-center (HSC) Facilitator were interviewed first. As the gatekeeper, the BC chose average performing HSC's, as well as the participating ANMs, ASHA, and AWWs. Then, the FLWs selected the HH with children between 6-23 months. Using this process may have led to selection bias as

each recruiter may have chosen respondents based on their ability to answer correctly. Also, information could have been shared about the type of questions asked during the interview.

To minimize bias, a bottom-up approach was used to select participants after the first round of interviews in Parbatta. FLWs were selected from a list provided by each block coordinator by using predetermined numbers to count down the list and identify participants. In the village, a predetermined number enabled the random selection of households from the FLW's home visit planner. Households were interviewed first followed by the FLWs.

IRB Approval and Informed Consent

Emory University's Institutional Review Board (IRB) exempted this study because it did not qualify as human subjects research, as defined by the IRB's regulations. Participants were made aware of the purpose, benefits, and risks of the interview before providing verbal consent.

Data analysis

MAXQDA 11 was utilized to analyze the interviews and describe FLW knowledge about complementary feeding guidelines, as well as HH knowledge and practice. For each block, transcripts were reviewed for richness based on discussion of feeding recommendations, use and knowledge of job aids, and HH practices. The richest transcripts were reviewed first until thematic saturation was achieved. Analysis of the data consisted of coding and segmenting the text, with memos that analyzed the key themes specified above. Thematic saturation was reached by the sixteenth interview, which included two FLW interviews and two HH interviews for each block. The

remaining twelve interviews were skimmed without the discovery of any new themes.

RESULTS

This section addresses the first two objectives of this thesis. The first objective is to describe FLW knowledge and use of job aids. The second objective is to describe HH knowledge and practices related to IYCF. The third objective focuses on identifying program gaps and recommendations for program improvements, which will be presented in the discussion section.

Objective One: *Describe FLW knowledge and use of job aids.*

FLW knowledge of IYCF content was divided into seven major subgroups, utilizing culturally appropriate recommended guidelines for complementary feeding. The guidelines address initiation, quantity, frequency, consistency, diversity, hand hygiene, and responsive feeding:

1. Begin to introduce cereal-based semi-solid foods after 6 months.
2. Feed age-appropriate quantity to the child (2 small katoris, 2 – 3 times/day – 6 to 8 months; 3 katoris, 3 – 4 times/day – 9 to 12 months plus snacks; 3 katoris throughout the day – 12 to 24 months plus snacks).
3. Feed age-appropriate frequency to the child (2-3 times in a day, and for 9 – 24 month children, include snacks between meals as well).
4. Feed thick, semi – solid food.
5. Wash your hands/child's hands before preparing food and serving food to the child.
6. Feed a variety of foods to the child using different ingredients available at home – cereals, vegetables, meat, dairy, fats/oils, fruits, legumes, etc.
7. Engage in responsive feeding by being sensitive to hunger cues, feeding slowly and patiently, encouraging the child to eat, minimizing distractions, and making eye contact.

Use of job aids was divided into three major subgroups: katori, mobile kunji, and

home visit planner.

Initiation of Complementary Feeding

Both types of FLWs were knowledgeable about the fact that complementary feeding should begin after 6 months. They all stated that they learned about this in the trainings provided by CARE, but they were not asked about other possible sources of information. Not only were FLWs aware of this recommendation, but also some participants in both high and low performing blocks were able to justify why timely initiation is important. After six months, breast milk no longer provides all the nutrients needed for the child to grow. However, there was some confusion amongst the FLWs whether initiation should begin at the beginning or end of six months of age. As illustrated by the quotes below, this confusion existed amongst both types of FLWs and in both types of blocks. The first quote below describes the belief that initiation should occur before the six month of age is over. Based on this belief, the FLW provides complementary feeding counseling during the fifth month of age, as households will begin to feed shortly after receiving information.

"Yes, if we tell earlier, they would start feeding from starting. They would start feeding from 4 months, or 5 months, so when the child is of 6 months, then we will tell or even of 5 months. Then we go and tell them, to start feeding when he becomes 6 months."

– AWW high performing block

Another quote illustrates the belief that complementary feeding should be initiated at the end of six months in order to ensure the child receives six full months of exclusive breastfeeding. *"Nothing is to be given to the child below six months old, only mother's milk is given. Complementary food is given to children more than six months old."*

– ASHA high performing block

There was only one ASHA, located in a low performing block, who stated that complementary feeding should be initiated at nine months of age. After further probing, it was discovered that the FLW believed that pulses water, which is thin in consistency, should be fed after six months and food with a semi-solid consistency should be fed after nine months. The majority of the FLWs interviewed also mentioned pulses water as an acceptable food for complementary feeding, which is incorrect due to the consistency. Participants were not asked how pulses water is prepared but an observed feeding in the field revealed food that was liquid in consistency.

Quantity and Frequency of Complementary Feeding

The FLWs mentioned the katori in order to describe the quantity associated with age-appropriate complementary feeding. They freely talked about this job aid without being asked and discussed how this aid was used to counsel households. When shown the bowl, FLWs would point to the 100 gram mark and state that this was the correct quantity for one bowl. During home visits, households would be shown the quantity with the katori as the FLW demonstrated feeding the child or measured the quantity in the katori before transferring what was measured into the household bowl. However, there were varied responses in terms of the exact quantity per day, and it was difficult to find a consensus amongst the data. It is believed that children 6 – 8 months should receive 1, 2, or even 3 bowls per day; children 9 – 12 months should receive 3 bowls per days; and children over 12 months should receive 4 bowls per day. Additionally, none of the respondents ever mention providing snacks. Although FLWs would answer how many bowls should be served in a day, a few participants in both types of blocks would state in other parts of the interview that the child can only eat a few spoonfuls and a small

quantity.

The quotes below depict the varied responses from the participants regarding frequency of complementary feeding. None of the respondents stated that the child should only be fed once a day, so there was knowledge that the child should be fed multiple times. It is clear; however, that there is confusion about how many times the child should eat in a day.

"I told them to mash the food in it and feed the child with it for three to four times in a day."

- ASHA high performing block

"As many times as the child can eat, four times, five times or ten times."

- ASHA high performing block

"Keep on feeding the child 2-3 times in day."

- AWW low performing block

Consistency of Complementary Feeding

As stated above in the initiation section, FLWs were still counseling households to feed pulses water even though they stated that food should be semi-solid. More FLWs in the low performing blocks recommended pulses water compared to those in the high performing blocks.

"It should be semi solid not much thick nor thin."

- AWW low performing block

"They can feed pulses water, khichdi, soft chapatti if available then it can be mashed in milk and fed."

- ASHA low performing block

There seemed to be more of an emphasis on making the food soft enough for the child to

consume as opposed to being thick enough to be considered nutritious. The FLWs talked a lot about mashing food before serving. During home visits, they tell households to mash the food or even show them through demonstration. Participants did not discuss other important factors related to consistency, such as the concept that the food is too thin if it slides off a spoon or slips through fingers.

Hand Hygiene

"Respondent- Yes this one is the most important that hands of child and your own hands should be washed before feeding the child. This is important, first of all hands should be washed.

Interviewer- Why do you think so?

Respondent- Because many diseases spread due to dirtiness. If they will stay neat and clean then child and mother will be safe from diseases."

- ASHA high performing block

There was general consensus amongst participants that hand hygiene was the most important guideline related to complementary feeding due to it's ability to prevent infection. Most FLWs were aware of this recommendation before attending CARE trainings; the main source of this information was from schools. The importance of using soap was discussed in the interviews, but alternatives, such as ash in the low performing blocks, were mentioned if soap was not available. Although FLWs stated that washing the child's hands is critical, they failed to mention washing the child's hands during home visit demonstrations. Only one AWW talked about an exercise she uses to illustrate the importance of hand hygiene. She tells moms to put their hands in water so that they can see all the dirt that goes into the water. This allows households to visualize that these germs will go into their food if they don't wash their hands.

"We says that.. See.. If you cook food for your child or yourself first wash your hands

with soap, and before feeding too.. See.. In our hands and nails so many dirt are there that's why we should wash.. I speak them that took some water and wash your hand now you will see how much dirty hands we have.. If you will not wash your hand before cooking and feeding, this all dirt will go I stomach and spreads diseases also.. There are so many small bacteria in our nail, but after washing with soap it all became dead.. In this way we did and showed them the dirt of hands…"

- AWW high performing block

Diversity of Complementary Feeding

FLWs were knowledgeable about the importance of feeding a variety of foods to the child. Due to financial constraints in both the high and low performing blocks, households are counseled to feed whatever they have at home and to implement diversity amongst the foods that are available in the house. Additionally, counseling messages focus on preparing dishes that are not too spicy or portioning out a small amount of the food before adding spices. This way the child can eat a greater variety of food by being exposed to what the rest of the household is eating.

"So that is to be fed to the child, the home made cooked food, there are so many people who are poor, they do not have milk curd or there is no meat fish, no fruits. So whatever is the cooked food at home that can be fed to the child isn't it!"

- ASHA low performing block

Responsive Feeding

Compared to the other guidelines, there was not much discussion in the interviews associated with responsive feeding. Participants did not talk freely about this topic and when they were asked, there was little elaboration. However, some participants demonstrated knowledge of responsive feeding by describing how the child should be fed if he/she is resistant,

"In families we tell that the children who are unable to eat, by telling him a story, with

love, by pampering him in a way that the child can eat, that is the way they should be fed by pampering them, the child should not be fed forcefully by giving medicines, he should be fed the way he likes it."

- ASHA low performing block

FLWs believe that a child communicates hunger by crying. They are not aware that by the time the child is crying, numerous hunger cues have been missed by the caretaker.

"When the child cries, then only we understand that he is hungry."

- AWW high performing block

Katori

As stated above, FLWs described use of the katori without being probed. They would use this job aid to demonstrate the appropriate quantity to households. Additionally, they would measure food or liquid up to the marking in the katori and then transfer to the household's bowl.

"There is a line in the given bowl. I mash the food in the bowl and show them that this much food is to be given to them and in this way."

- ASHA high performing block

It is important to note that field notes reveal that a few FLWs in the low performing blocks pointed below the marking in the katori in order to show how much the quantity should be. However, all of the FLWs in the high performing blocks pointed to the correct marking. FLWs stated that they enjoyed using the job aid and that it helped households understand the counseling message. A reported challenge was that some households would ask for the katori or request that the FLW bring the katori every day to feed the child.

"Majority of people thinks that they should get something. In village, everybody wants something, Now only when I was showing bowl, they were asking for it. How can I give

the bowl?"

- AWW high performing block

Mobile Kunji

All participants, with the exception of one ASHA in a low performing district, recognized the mobile kunji and were able to explain how to use it. They discussed how participants were more likely to listen to the recording of Dr. Anita on the phone instead of just advise from the FLW. However, FLWs did not use this tool as often as the katori. This job aid was reserved for those households that did not understand after an initial verbal explanation. The mobile kunji was not seen as something to be used for all beneficiaries but as a back up plan if an initial counseling session was unsuccessful. One FLW in a high performing block even stated using this tool if she herself did not understand a topic. Participants were not specifically asked which topics they cover while using the mobile kunji. However, approximately one quarter of the FLWs mentioned using the tool to discuss immunizations and hospital deliveries.

"Respondent – I explain them but if they do not listen then I show this.
Interviewer – ok! Then you take out this and show… otherwise you don't show in every house.
Respondent – No…. otherwise its value will be over."

- AWW low performing block

"If I will not understand this then I will call."

- AWW high performing block

Home Visit Planner

FLWs discussed how using this job aid increased the number of home visits, as they were able to keep track of beneficiaries. Field notes reveal that home visit planners seen by the interviewers were mostly filled out and up-to-date. According to CARE,

issues encountered during each home visit should be written down so that they may be addressed in the next visit. FLWs only wrote the date that they completed each home visit. The practice of writing down issues associated with each visit was neither observed in the field nor discussed in any interviews. There was also an observed encounter in the field where an eligible household in a low performing block was missing from the planner and subsequently not receiving home visits. At the time of the encounter, the FLW did not wish to discuss why this household was excluded, and she was not asked again during the interview. Moreover, participants focused on how the tool was helpful to know a pregnant woman's due date or when a child needed a certain immunization, as opposed to be used for timely complementary feeding visits.

"It is beneficial… In this there is name of a child, registration to meet them……it is good to give them the injection."

- ASHA low performing block

Objective Two: *Describe HH knowledge and practices related to IYCF.*

The same recommended guidelines for complementary feeding were used to analyze household knowledge and practices. They were also asked about exposure to and knowledge of the katori and mobile kunji. Households were not asked about the home visit planner since this would not be used in a counseling session.

Initiation of Complementary Feeding

Unlike the FLWs, many of the households were not aware that complementary feeding should begin after six months of age with semi-solid food. The few women who were aware of this recommendation had received this information during a home visit with a FLW. A few exceptions include one mother in a high performing block who learned information studying home science and a mother in a low performing block who

received information at the AWC. However, the majority of women in the sample were not aware of this guideline. Most of these women report they have not received a home visit from a FLW. Two of the participants had home visits with a FLW, but the topic was about immunizations for both. All participants except one in a low performing block were giving their child complementary food. The main reported sources of information were family members, the child's behavior (grabbing for food), and their own idea. HHs did not mention which advice they were likely to follow if they received conflicted information, but all participants responded that they would listen to a FLW if information was given. The ages of initiation ranged from 4 months to 10 months. A FLW also revealed that a few HHs believe exclusive breastfeeding should occur for a year and that the child's stomach will become big if the child receives complementary food before turning one.

"If they will provide food now then there stomach will become bigger so we will not provide food ……. It will be provided only after one year."

- AWW low performing block

Quantity and Frequency of Complementary Feeding

As stated above, most of the participants in the sample did not receive information about complementary feeding during a home visit with a FLW. For this reason, most participants were unaware of age-appropriate quantity. Household respondents did not discuss measuring the quantity of food; they just knew the child could only eat a few spoonfuls with each feeding. Participants were not probed about the sources of information for this belief. Additionally, there was low awareness about the katori amongst the households. Most of them could not identify the tool and were not knowledgeable about the significance of the marking.

"Interviewer- If I tell you to feed 1-2 bowls to your child with spoon. The bowl is this much big and you have to feed this much.
Respondent- He won't eat.
Interviewer- Why he won't eat?
Respondent- He will eat only 2-3 mouthfuls."

- Mother low performing block

All of the respondents reported that they fed the child more than one time a day. The responses ranged from 2 – 4 times a day. Households also discussed how working in the field made it difficult to come home and feed the child frequently.

"We have to leave all the work in the middle and then we have to feed the child first and then we have to continue doing my work, these all difficulties I have to face."

- Mother high performing block

Consistency of Complementary Feeding

Similarly to the FLWs, the households in both types of blocks were knowledgeable that the consistency of the food should be semi – solid. They described the consistency by saying the food is in between thick and thin, soft, mashed, and does not slide off a spoon. Despite this description of the food, households were still feeding pulses water and believed that it was an acceptable form of complementary food. Field notes illustrate a scenario where a mother in a low performing block demonstrated how she fed her child with pulses water, which was liquid in consistency. For those women in high performing blocks who received home visits from FLWs, they reported that the FLWs instructed them to feed pulses water. Moreover, some households were feeding the child solid food, such as rice and pulses that were not mashed.

Hand Hygiene

All the households stated that they had heard this guideline from either a FLW or a

family member. However, field notes reveal that none of the participants were observed washing their hands with soap; only water was used. The child's hands were also not washed. One participant in a low performing block stated that she did not wash her hands with even water before feeding the child. Her sister justified her response by saying:

"She is so hassled by the child that she doesn't care about washing her hands."

- Aunt low performing block

Diversity of Complementary Feeding

The most commonly fed foods by households include pulses, rice, chapati, vegetables, fruits, and pulses water. A few households in the low performing blocks feed biscuits and chocolates, but there were no other differences noted when compared to the high performing blocks. Households find it more difficult to feed meat and egg, as this is more expensive. For those households that have meat in the home, chicken, liver, and mutton are common foods. If a dish in the household is cooked with spices, this is not given to the child.

"Interviewer – Why don't you feed vegetables?
Respondent – The vegetables are being cooked hot and spicy."

- Mother low performing block

Responsive Feeding

The topic of responsive feeding was not discussed as much as the other guidelines in the household interviews; this was a similar finding for the FLW interviews. Mothers stated that no one discussed responsive feeding with them, but that they naturally made eye contact with the child and encouraged the child to eat.

Katori and Mobile Kunji

Most households had never seen the katori before, except for one mother who had

seen the tool before from a neighbor and another mother who had seen the tool during a home visit with a FLW; both of these mothers were in high performing blocks. When asked to point to the correct quantity, household respondents pointed below the marking, as they were not aware of what the marking symbolized. Moreover, households were also unaware of the mobile kunji. Similarly to the katori, most households had not seen this job aid before except for one mother in a high performing block who could not remember where she saw the tool.

Table 3: Summary of FLW and HH Knowledge of IYCF Guidelines and Job Aids

Guideline or Job Aid	**Participant**	
	FLW	**HH**
Initiation	High	Low
Quantity	Moderate	Low
Frequency	Moderate	Moderate
Consistency	Moderate	Moderate
Hand Hygiene	High	Moderate
Diversity	High	Moderate
Responsive Feeding	Low	Low
Katori	High	Low
Mobile Kunji	High	Low
Home Visit Planner	Moderate	Not Asked

Other findings

Another major finding that emerged from the data was the source of motivation for

the FLWs. All of the FLWs discussed how they enjoyed performing social work and felt good that they were helping to improve the health of children in their communities. The act of helping others and making a difference is what they found appealing about the position. None of the FLWs mentioned money or status as a source of motivation.

"It is like this madam that we have never thought about salary, it is just that health.. Uh.. All this is been done for social service, all society related work is been done over here, what government has to do they will do it."

- ASHA low performing block

"I feel like, in village I can provide food, education to uneducated children and it will make me feel good, as a worker I can serve, can help all those children, make them study."

- AWW high performing block

DISCUSSION

This section will identify program gaps and discuss recommendations for program improvements, in order to improve household knowledge and practice of complementary feeding in Bihar, India.

Program gaps

Gap Between FLW and HH Knowledge of IYCF Content

Results of this study reveal that there is a significant and alarming gap between FLW knowledge and HH knowledge and practice regarding complementary feeding. As a cohort, FLWs were aware of the recommended guidelines and most were able to provide correct information for each guideline (except as mentioned above). However, the majority of the households interviewed were either unaware of the recommended guidelines or provided incorrect information when asked.

It is important to note that the few households that were knowledgeable about complementary feeding mostly resided in Parbatta, where the initial top-down approach was used. This finding may be due to selection bias, as FLWs felt more inclined to select households that were knowledgeable about complementary feeding. The fact that the FLWs knew which household would be knowledgeable suggests that they discussed this topic before, most likely during a home visit. Although the bottom-up methodology was more effective at assessing overall HH knowledge and practice in the blocks identified, the initial top-down approach was still useful. It illustrated how effective counseling messages during home visits could be if they are actually completed. These findings suggest that the HSC training content increased FLW knowledge and that counseling messages during home visits can increase HH knowledge. Therefore, the real issue is that

the majority of households are not receiving home visits.

Gap Between FLW Job Aid Use/Knowledge and HH Knowledge

Similarly, households that received home visits were knowledgeable about the various job aids, while those households that were not visited were unaware of the tools. A few of the FLWs stated that they did not want to utilize the job aid unless a household did not understand through initial verbal information. However, this does not justify the low awareness amongst households interviewed, as most of these households were not knowledgeable about complementary feeding and would have benefitted from being shown the job aids. These findings further suggest that the lack of home visits is inhibiting the adoption of more effective complementary feeding behaviors.

Low Prevalence of Home Visits

Various factors could contribute to the lack of home visits, such as social class, income, and religious differences between FLWs and households, distance of beneficiaries from the FLW, and prohibition of the FLW to leave her house due to family rules. All of these were reasons stated by CARE officers in the field. Since the FLWs stated that they were completing most, if not all, home visits, they were never asked about possible reasons for not completing a visit. Additionally, only the AWWs are salaried while ASHAs receive incentives based on the number of immunizations and hospital deliveries. In order to generate income and provide for their own families, it is understandable that ASHAs would choose to focus on tasks for which they are paid. Unfortunately, nutritional counseling is not included as one of the tasks that generate income for the ASHAs.

Current Research

One study in Haryana, India found that 42.6% of participants from eight different communities received home visits when the child was between 7 – 12 months of age [13]. However, this study did not only focus on equipping FLWs with counseling messages but utilized other health workers to study a multiple channel effect. The use of multiple channels, or various types of healthcare workers and platforms for counseling, was found to be a key indicator in increasing HH knowledge. Additionally, current research does support the finding that when community health workers complete home visits, they are effective at increasing HH knowledge and practice, and ultimately health outcomes [9; 14; 15]. Studies illustrate the association between counseling messages and improved complementary feeding practices [9], increased weight gain, [15], and reduced neonatal mortality [14]. This provides even more support for the assumption that it is not the intervention of home visits that are ineffective, but the lack of home visits that are contributing to child malnutrition.

Recommendations

Motivate FLWs

To fill the gap between FLW knowledge and HH knowledge and practice of IYCF, it is recommended to use innovative methods in order to motivate the FLWs. The findings suggest that the disparity in knowledge between FLWs and HHs is attributed to the low prevalence of home visits in the four blocks selected. As a foreigner, it is difficult for me to address issues of social class, income, religion, and cultural values. However, data from the interviews offer insight into sources of motivation for the FLWs. When asked to describe why they chose to become a FLW, most stated that the work of social service and knowing that they were improving the health of children was most appealing.

In order to keep the FLWs motivated, regular updates about community statistics should be shared at HSC meetings. If the FLWs are aware of the difference they are making through actual data and real case studies, this would encourage them to keep serving their communities.

Another way to motivate FLWs would be to utilize a team-based approach to home visits with a reward system. Providing concrete and achievable goals for the number of home visits to complete with appropriate timing would encourage both teamwork and productivity. Recognition ceremonies with a small gift would be something that the FLWs could look forward to while carrying out their work. CARE is currently piloting a team-based incentive approach in Bihar, so this would not be a foreign method for staff to adopt.

Positive Deviance

Positive deviance can be utilized in communities in order to build on existing behaviors and practices that are beneficial to child nutrition [16]. Those HHs who are performing well can be motivated to serve as role models and counsel other HHs. This approach would help the HH stay knowledgeable about IYCF, as members of the HH would be educating others. Additionally, it would decrease the burden on the FLWs as HHs begin to take ownership of the spread of knowledge throughout the community. Similarly, FLWs who are performing well can serve as role models to other FLWs. This would encourage the FLWs who are doing well to continue to do so since being a role model would raise their status. It would also give FLWs who are struggling to complete home visits more support and information on how to work effectively. One study in Bangalore, India found that the use of positive deviance contributed to the improvement

in nutritional status among children attending AWCs between the ages of two and six [16]. This approach should be expanded to address nutritional issues affecting children under the age of two.

Further Training

Although the FLWs were generally knowledgeable about the different guidelines for complementary feeding and job aids, there were still some inconsistencies regarding some of the content. It is recommended that further training is provided on quantity, consistency, responsive feeding, the mobile kunji, and the home visit planner.

FLWs produced varying responses when asked about the recommended quantity of complementary food per day according to the age of the child. Additionally, a few of them would also contradict themselves later by stating that the child can only eat a few spoonfuls. The lack of consensus regarding quantity suggests that this information was not clear in the HSC meetings. Moreover, FLWs would contradict themselves by stating that semi-solid was the correct consistency and then recommending pulses water, which is liquid, to households. Although none of the respondents described how pulses water is prepared, an observed feeding in the field revealed food that was definitely liquid in consistency. Responsive feeding should be discussed again as none of the respondents had much to say about this topic. FLWs would discuss the other major guidelines without probing but would never bring up responsive feeding unless asked. The inability to naturally include responsive feeding in a discussion surrounding complementary feeding suggests that this is often not included in counseling messages. In terms of the job aids, clarifications should be made on how to properly use the tools. The mobile kunji was created to be utilized for all households; however, some of the FLWs preferred to save

them for repeat counseling sessions. The purpose of the home visit planner is to keep track of the home visits and issues presented during each visit. Observations in the field revealed that FLWs were not tracking the issues, which made it difficult to follow up during the next visit. If FLWs are more adequately educated about these topics, their counseling messages and confidence should improve.

Other Recommendations

Another recommendation that stemmed from the data was the possibility of producing the katori for mass use. FLWs stated in the interviews how HHs would ask for the katori during demonstrations. If HHs could purchase or receive a katori with the 100-gram marking, this would ensure that they understand the quantity that should be served to the child. The caregiver would no longer have to guess as the marking would provide guidance. One pilot study in Samastipur District showed that providing HHs with a katori resulted in improvements in initiation, quantity, frequency, and consistency [17]. Another recommendation would be to consider community meetings. Although some mothers are unable to leave the house due to family traditions, another family member can attend the meeting to receive the information. For those mothers who are able to leave, community meetings would be a great avenue for introducing mentors to mentees. Furthermore, the FLWs stated that community meetings would decrease their burden as they are able to reach multiple HHs at once.

Limitations and strengths

Due to the nature of qualitative research, these findings cannot be generalized to other populations. Additionally, the initial top down approach in the Parbatta block may have skewed the data as FLWs selected the HHs for interviews. Due to this possible

selection bias, it is difficult to grasp just how low the prevalence of home visits are in the selected blocks. However, this initial approach ended up serving as a strength as it revealed that when home visits are done, they can be effective. Due to the change in the approach, another limitation emerged as the majority of HHs interviewed did not receive a home visit about complementary feeding. This study was examining the overall knowledge and practice of IYCF in the selected blocks. The second, bottom up approach was a major strength as randomization revealed that the number of home visits being completed in the four sampled blocks was low. However, it would be interesting to see the results of another study that specifically targets HHs who have received counseling messages in order to see if the messages are truly effective.

Additional questions

In the field, it would be helpful to follow up with additional questions that arose from the data. One question that was not answered was the main sources of information for the HHs. They were asked first if they were aware of a certain guideline and if they were, the source of information was probed. However, it would be beneficial to ask an open-ended question about the source of information and type of message received about complementary feeding. If a future study reveals that HHs are receiving and following information from specified sources, then further interventions should target those sources. Another topic to investigate would be possible reasons for not completing a home visit or visiting a particular household. The FLWs themselves should be asked in order to gain a deeper understanding of the barriers they face. This could be a sensitive topic for the FLWs, so the study should focus on identifying barriers and asking the FLWs what

would help them complete more home visits. It is imperative that this is the next step taken by CARE as the lack of home visits was the main issue identified in this study.

CONCLUSION

This thesis described FLW knowledge and use of job aids, described HH knowledge and practices related to IYCF, and identified program gaps and recommendations for program improvements. Although it was found that the FLWs were fairly knowledgeable about complementary feeding, there was a significant and disturbing gap between FLW and HH knowledge. Upon further examination, study findings suggested that a main contributor to this gap was the low prevalence of home visits in the selected blocks. Based on these findings, recommendations were proposed to assist CARE in increasing the outreach of counseling messages through the delivery of FLWs and HH role models.

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