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Use of Photovoice to assess Knowledge, Attitudes and Practices (KAP) towards nutrition and complementary feeding among households in Bihar, India.

By

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Use of Photovoice to assess Knowledge, Attitudes and Practices (KAP) towards nutrition and complementary feeding among households in Bihar, India.

By

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Bachelor of Dental Surgery

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2012

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An abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
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ABSTRACT

Use of Photovoice to assess Knowledge, Attitudes and Practices (KAP) towards nutrition and complementary feeding among households in Bihar, India.

By Gunjan Batra

Introduction: Bihar is one of India's poorest and least developed states. Approximately 58% of its children are underweight, with the third highest number of malnourished children in the country. Poor child feeding practices in region contribute to high levels of malnutrition.

Objective: This study aims to assess knowledge, attitude and practices (KAP) towards nutrition and complementary feeding among households in Bihar, India.

Methods: Photovoice with focus group discussions was used for this study. Participants (n=30) were trained to use digital cameras and three focus group discussions were carried out in addition to camera training and collection. Two of these focus groups were performed with mothers having children between 6-18 months of age. The third and final focus group was performed with community members (husbands/in-laws to the mother).

Results: This KAP study was instrumental in revealing participant knowledge of causes and effect of malnutrition as well as sources of knowledge in the community. There was no evident lack of knowledge among the study participants, this is in contrast to finding of prior studies done in India which highlight a lack of knowledge relating to breastfeeding and IYCF practices. Programmatic barriers identified included lack of coverage by frontline workers, inadequate counselling provided to the beneficiaries and other concerns affecting the compliance of the multiple micronutrient product. The participants were limited by financial constraints and inadequate access to healthy foods in practicing proper IYCF practices. Lack of decision making by mothers/women in the household was also an important theme that emerged during the discussions.

Conclusion: The findings of this study provided a situational analysis of Knowledge, Attitudes and Practices towards nutrition and complementary feeding in Bihar, India which can be particularly useful in informing decision making and adapting interventions to the context. The photovoice methodology can serve as a powerful tool to enhance participation by allowing participants to convey 'their own' stories by way of the photographs. Furthermore, as in the design of this study, nutrition interventions could be tailored to involve household members (husbands and in-laws) rather than solely the mother to improve acceptability, compliance and collaboration.

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TABLE OF CONTENTS

ACRONYMS

ANM	Auxiliary Nurse Midwife
ASHA	Accredited Social Health Activist
AWC	Anganwadi Center
AWW	Anganwadi Worker
BCC	Behavior Change Communication
FLW	Frontline Worker
HAZ	Height for age Z scores
ICDS	Integrated Child Development Services
IFHI	Integrated Family Health Initiative
IYCF	Infant and Young Child Feeding
SBCC	Social and Behavior Change Communication

CHAPTER I

INTRODUCTION

More than one-third of the world's undernourished children are in India, among which 61 million are stunted and 43% of children under five years of age are underweight (UNICEF,2007). The state of Bihar accounts for the third highest number of malnourished children in India. The percentage of underweight children being 58.4% in 2005. Estimates show that 8.33% of children in Bihar suffer from severe acute malnutrition (SAM) and are at highest risk of dying (UNICEF, 2008).

A major contributing factor to under nutrition are micronutrient deficiencies particularly those of iron and vitamin A especially in developing countries (WHO, 2011). Deficiencies of fat- soluble vitamins, iron and zinc are particularly associated with protein-energy malnutrition (Wolters Kluwer, 2015). Keeping in mind the nutritional demands of infants, children, pregnant and lactating women, they are most vulnerable to micronutrient malnutrition especially during the first two years of life (WHO, 2011; UNICEF, 2006). Lack of access to micronutrient-rich foods such as fruit, vegetables, and animal foods either because they are too expensive to buy or are locally unavailable are a major reason for such deficiencies (UNICEF, 2006). Micronutrient deficiencies also increase the risk of infectious diseases such as diarrhea, measles, pneumonia and malaria which are one of the leading causes of mortality all over the world (UNICEF, 2006). In addition to this, it also contributes to impaired physical and mental development. Pregnant women are at a greater risk of delivering an underweight or mentally impaired baby. The health and development of the breast-fed infant also depends on the nutritional status of the mother (UNICEF, 2006).

Another major cause of onset of malnutrition in young children is inappropriate feeding practices (WHO, 2002). Inadequate breast-feeding results in decreased immunity and delayed/inadequate growth (WHO, 2002). Such children are also almost six times more likely to not survive during the first month of life (WHO, 2002). The period of six months onward is particularly vulnerable during which a gradual transitioning to family foods is made (Dewey, 2010; WHO, 2002). Malnutrition incidence is seen to sharp rise during the period of 6-18 months, especially in developing countries and the deficiencies are difficult to compensate for later in life (WHO, 2002). Educational counseling about complementary feeding practices provided to mothers during the child's age of 6-12 months (window of opportunity to reverse malnutrition) along with improved hygiene practices has the potential to effectively combat malnutrition (Roy, 2007). Nutrition interventions during this period can lead to great benefits. Feeding practices appropriate for the child's age, nutritionally adequate foods, and continued breastfeeding can ensure optimal growth and development (Roy, 2007; Dewey, 2010).

CARE IFHI Background

Focusing on 137 blocks of 8 districts in Bihar, the initiative is led by CARE India and supports the Government of Bihar to improve family outcomes statewide while accelerating progress towards MDG goals 4 and 5 of reducing child mortality and improving maternal health. The 5 year initiative, funded by the Bill and Melinda Gates Foundation is also supporting the government in scaling up activities in the remaining 30 districts of Bihar.

With the overall goal of supporting the Government of Bihar "to improve the health and survival of families with pregnant women and women with children less than two years across the continuum of care", the IFHI has 4 main objectives which include delivering cost effective family health interventions, improving quality of key health services, improving utilization of

health services and uptake of health promoting behaviors and identification and adoption of successful approaches while communicating successes nationally.

Solutions which are being tested and implemented in 8 innovation districts includes program management, integrating services across the "window of opportunity", and integrating the efforts of health and Integrated Child Development Services (ICDS) programs at all levels, Improving tools and skills of frontline workers and their supervisors, optimizing financial and non-financial incentives for healthcare providers and families and making the best use of qualified private providers for key maternal, newborn and family planning interventions. Effective strategies and tools benefitting family health will be documented to further benefit public health in India and internationally.

MMP Innovation

As part of program activities in Bihar, CARE and Emory University are investigating the potential of home fortification integrated with IYCF counseling to improve the nutritional status of young children. The study population includes children of 6-18 months of age from four blocks in the West Champaran district, from all castes, religions and socio-economic status. For the purpose of this photovoice study, a subset of households participating in the Emory-CARE India project were selected.

Research Question:

Use of Photovoice to assess Knowledge, Attitude and Practices (KAP) towards nutrition and complementary feeding among households in Bihar, India.

Objectives:

1. **To assess the knowledge, attitudes and practices of the primary care giver (mother) towards nutrition and complementary feeding.**
2. **To study how nutritional knowledge and attitudes translates to IYCF practices in the household.**
3. **To assess and compare knowledge, attitudes and practices of the primary caregiver with other household members i.e. husband, mother-in-law/father-in-law and daughter/sister-in-law.**

Significance:

KAP studies are important in assessing beliefs and behaviors of communities over time by providing insights and data. This information helps tailor interventions to the social, cultural and political context of communities (Global polio eradication initiative, 2010). Studies analyzing nutrition KAP provide an insight into the population's personal determinants of dietary habits providing valuable input for effective program and project planning (FAO, 2014).

CHAPTER II

LITERATURE REVIEW

Malnutrition is a multifactorial problem in developing countries, some of which include poverty, food insecurity, poor access to health services and teenage pregnancies. In addition to this, a lack of education and culturally prevalent practices contribute significantly to the burden of malnutrition (Gragnolati, 2006). The dominant focus of current programs such as ICDS is food supplementation, which is at the expense of other important but frequently neglected aspects of improving child-care behaviour and educating parents on improving nutrition in their family. Additionally, little attention is given to micronutrient supplementation and disease prevention and control. Even though thoughtfully conceived, such skewed priorities render current programs such as ICDS, ineffective (Gragnolati, 2006).

A research study conducted in the sub-Saharan Africa region concluded that cultural food practices rather than the frequently mentioned poverty and ignorance should be recognized as a vital etiology of malnutrition (Ogunjuyigbe, 2006). Prolonged and sustained efforts of improving the educational status of parents, especially mothers has been proven to decrease the incidence of malnutrition (Harnagle, 2013). Mothers are not able to effectively utilize available resources due to lack of knowledge of optimal feeding behaviours and inappropriate cultural feeding practices such as delaying breastfeeding, early termination of breastfeeding and early introduction of supplementary feeding (World Bank, 2015). Educational counselling provided to mothers during the child's age of 6-12 months (window of opportunity to reverse malnutrition) along with improved hygiene practices has the potential to effectively combat malnutrition (Roy, 2007).

According to Smith and Haddad (2001), improvement in women's educational status was responsible for an almost 43% reduction in malnutrition in developing countries in 1970-75. With an improvement in relative status coupled with education contributing to more than 50% of the decrease in malnutrition rates (Smith, 2001). Although often an overlooked aspect of public health interventions, increased knowledge and skills gained through education improves the quality of day to day care the women provide to their children as well as enhance household security (IFPRI, 2003). With education and status comes the ability to influence household decisions and hence improve the nourishment of her children (IFPRI, 2003). According to the NFHS study done in India, "children whose mothers have little or no education tend to have a lower nutritional status than do children of more-educated mothers, even after controlling for a number of other—potentially confounding—demographic and socioeconomic variables." (NFHS, 2000)

There is a need for strengthening maternal and child health KAP related programs with education included on topics like immunizations, sanitation, and treatment of diarrhea, acute respiratory infections and worms (Harnagle & Chawla, 2013). Findings of a study done by Harnagle (2013) indicate that maternal KAP of common childhood illnesses is deficient. In addition to this, antenatal care for mothers as well as vaccination and nutritional status of children is barely satisfactory. Maternal education and KAP are shown to be significantly and independently associated with children's nutritional status with key areas including nutritional requirements of children, nutritional value of foods, immunization, hygiene, oral rehydration and diarrhea (Gupta, 1991).

From Knowledge to Practice – Motivating Behavior Change through Communication

Merely increasing knowledge and awareness of good nutrition practices does not lead to sustained behavior change. Facilitating the voluntary adoption of food- and nutrition-related behaviors that are conducive to health and well-being, addressed by identifying the needs, perceptions, motivations and desires of the target audience and ensuring active participation makes them more effective (Contento et al., 2015).

"Behavior change communication (BCC) *is an interactive process with communities (as integrated with an overall program) to develop tailored messages and approaches using a variety of communication channels to develop positive behaviors; promote and sustain individual, community and societal behavior change; and maintain appropriate behaviors."* (FHI, 2002)

For interventions where BCC is an integral part, effective BCC can increase knowledge, stimulate community dialogue and promote attitude change in addition to improving skills and sense of self-efficacy by advocacy and creating a demand for information, services as well as preventive care (FHI, 2002). BBC works by making positive practices more desirable and easy to adopt by identifying principal determinants such as public support, social norms, and self-efficacy. Sustainable adoption of such positive practices help reduce health disparities and enhance community capacity (Katigbak, 2015).

"The participation of fathers and elders in the family in child care and sharing household responsibilities are important for improving IYCF practices. The community support groups have a vital role in providing information on correct IYCF practices and supporting mothers in problem solving and care seeking." (Nandan & Yunus, 2009)

Using multiple BCC approaches and channels to behavior change is more effective than targeting only the woman/primary caregiver herself. Additionally, more the number of visits or contacts greater the change in behavior. Since the target audience is an important aspect of BCC interventions and many people can influence whether an individual adopts or fails to adopt a promoted behaviour, various audiences or sphere of influences need to be included such as (SPRING, 2014):

- *Self/caregivers* : (including pregnant and lactating women) , other immediate caregivers of children under two;
- *Direct influencers* : partners/fathers, mothers in-law, siblings, other family members, and peers;
- *Local Community*: including community members, leaders, social groups, and providers; and
- *Other structures:* including the government (national, sub-regional, district and/or municipal), business, and faith and movement leaders.

Even though BCC is a key component of IYCF programs in low-income countries, differences in local context such as social norms, culture, and environmental factor, differences in the implementation and scale of implementation affect the success of such interventions (SPRING, 2014). Therefore, formative research should involve proper context assessments. In addition to this, process evaluations which involve understanding and improving program implementation need to be incorporated. Challenges to BCC strategizing include lack of integration into interventions, limited resources such as trained in-country resource people, unsupportive political and physical environment, lack of sustainable strategies which can constantly evolve to meet the population's needs, lack of expansive coverage and budgetary constraints (FHI, 2002).

The Socio-ecological framework for Behavior Change (Kaufman et al., 2014):

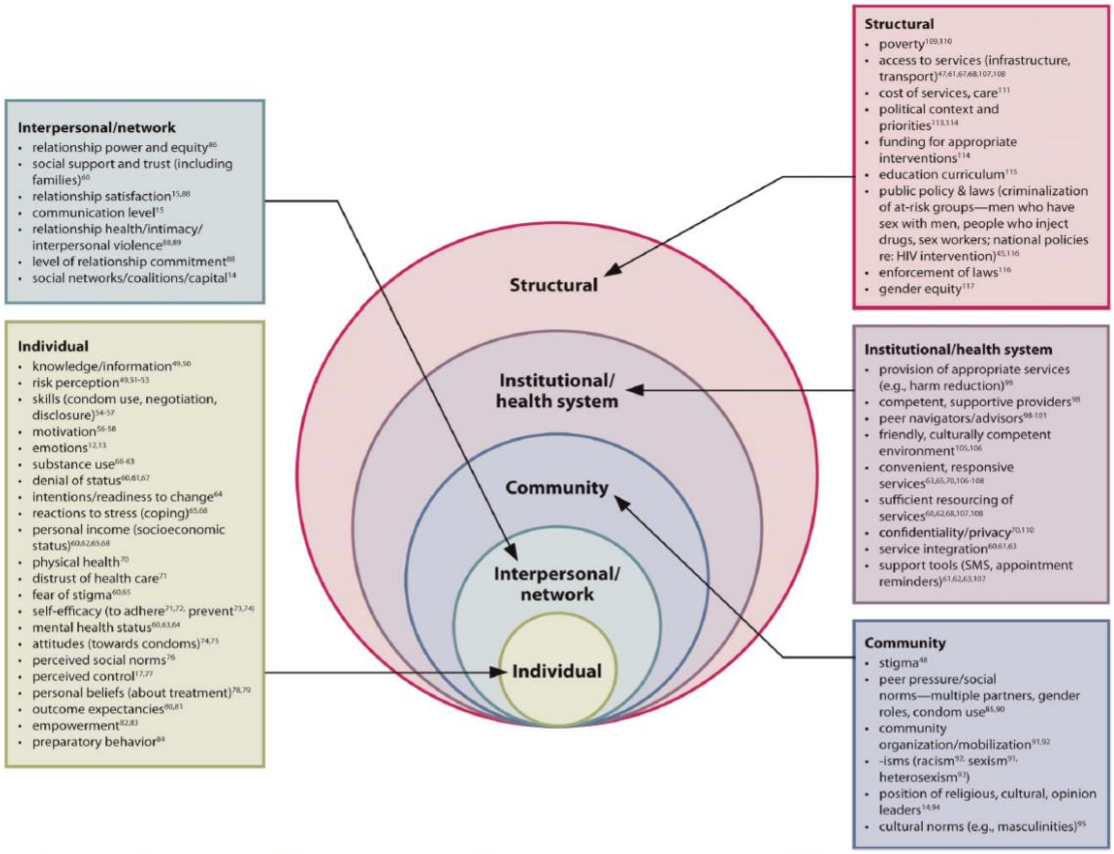


FIGURE 1. Factors influencing HIV-related behavior and/or behavior change at each level of the socio-ecological model.

The above framework presents the factors influencing behavior change.

Comprising of 4 levels:

The individual level comprising of microlevel factors such as individual perceptions, beliefs and emotions.

The interpersonal/network level includes dyadic or family influences, such as relationship satisfaction or social support.

The community level includes influences at a larger group level, such as social capital or community norms.

The institutional level focuses on factors within the health system, such as quality of service providers, confidentiality, or sufficient resources.

The structural level includes the most macro-level factors affecting behavior, such as availability of transport, access to clinic and more broadly the economy, political climate, enforcement of policies and laws, or funding environment. This also includes more removed factors such as wars, famines or droughts.

According to Kaufman (2014), even though differentiated, the *levels* are interactive with processes ranging from micro and macro. Structural factors depend on the interaction between individuals and their relationships and vice versa. The model also incorporates some variables that have only recently been investigated, such as emotions, social networks/coalitions/capital and relationship investment.

Implications for nutrition practices:

The Social-Ecological Model can help us understand the roles that various segments of society can play in making healthy choices and adopting healthy practices thereby facilitating positive behavior change (FNS USDA, 2010). The model can be used to develop, implement and evaluate interventions at all levels as it considers interactions between the individual, families, and environment as well as social and cultural norms and values. Facilitating multiple, coordinated primary prevention strategies promotes a *society oriented* approach. Efforts towards IYCF and breastfeeding practices and counselling are more likely to succeed with a system-wide approach (FNS USDA, 2010).

Recent efficacy to effectiveness trials have demonstrated the positive effects of community-based behavioral change approaches to improve breastfeeding and complementary feeding practices in children 6-23 months of age. There is however considerable variation in the description of SBCC interventions, interactions or combinations with other interventions, target groups, content, messages, scale and coverage, length and intensity, as well as context (Mbuya, 2013).

Concerns regarding limited knowledge uptake resulting sustained behavior change are often attributed to the concept of ***"two communities"***, that is the reality that researchers, policy makers or clinicians inhabit "different worlds". This means that merely receiving knowledge does not necessarily lead to using it, especially if the parties do not share the same focus, language, culture or research agenda. (Johnson, 2005). According to Graham et al (2006), innovations to improve 'knowledge translation'[1] strategies should be encouraged, especially those aimed to improve the know–do gap in developing countries. This effective utilization of research involves identifying and adapting knowledge to local context. A key aspect of such interventions includes assessing barriers & facilitators to knowledge use followed by tailoring and implementation of interventions to address these barriers. Monitoring and evaluation strategies to ensure sustainability of interventions also need to be developed (CIHR, 2000).

[1] The term Knowledge Translation (KT) is used in fields of public health, medicine and rehabilitation research. KT refers to underutilization of evidence-based research in systems of care thereby widening the gap between "what is known" and "what is done" in practice settings (NCDDR,2005). The primary purpose of KT remains to address the gap between large volume of research and its systematic review and implementation by key stakeholders. In more common terms, it is **the gap between awareness and behavior change.**

The knowledge to practice gap – Addressing barriers to IYCF:

IYCF practices in India are poor and have been identified as a critical area for improvement in nutrition outcomes (Ramachandran, 2010). Poor feeding practices are associated with poor nutritional outcomes especially low HAZ and increased prevalence of stunting (Menon, 2015). Delayed initiation of breastfeeding causing deprivation of colostrum and improper complementary feeding are most significant risk factors. Exclusive breastfeeding along with timing of initiation of breastfeeding and age at introduction of complementary feeding were found to be significantly associated with nutritional status of children (Kumar, 2006).

According to the Lancet series on child survival, infant and young child feeding ranks among the most effective interventions to improve child nutrition/health and reduce child mortality (UNDAF, 2010). Achieving universal coverage of optimal breastfeeding practices can prevent up to 13 per cent of deaths occurring in children <5 years of age, while complimentary feeding practices would result in addition 6 percent of decrease in under-five mortality. Optimal IYCF practices include early initiation of breast feeding i.e., within an hour of birth; exclusive breastfeeding till 6 months of age; and introduction of complementary feeding at 6 months while continuing breast-feeding up to 2 years or beyond (Nandan and Yunus, 2009).

According to the DLH survey (2007-08) in India, "40.2 per cent of the children under three years are breast-fed within one hour of birth, 46.4 per cent of the children aged 0-5 months are exclusively breastfed, 24.9 per cent of the children aged 6 to 35 months are breast-fed for at least 6 months and 23.9 per cent of the children aged 6 to 9 months receive solid, semi-solid foods and breast milk."

The reasons for such low levels of good IYCF practices include misconceptions among mothers/primary caregivers, dependence on ready to eat foods, inadequate aid by the government to address malnutrition, no time devoted to preparing special meals for infants or modifying the food cooked for adults (Nandan and Yunus, 2009). Evidence also supports the fact that mothers/primary caregivers require active support for establishing and sustaining appropriate IYCF practices. This however is not emphasized in training of health personnel, therefore due to absence of adequate knowledge and skills, healthcare professionals are often barriers in improving IYCF practices. It is for this reason that it is important to build knowledge, capacity for behavior change communication and counselling and developing problem solving skills among the Anganwadi Workers (AWWs), Accredited Social Health Activists (ASHAs) and Auxiliary Nurse Midwives (ANMs) for improving the IYCF practices. Sensitization and training of medical and paramedical personnel who serve as the first point of contact or the mothers also needs to be initiated (Nandan & Yunus, 2009).

Another major reason cited for lack of adherence to good IYCF practices is that of missing community support. Therefore, there is also a need to sensitize the community including family members, panchayat members, women's groups and other local resource groups. It is also important to involve the elders and fathers/husbands in child care and household responsibilities.

Other commons factors cited as barriers to good breastfeeding and IYCF practices and which influence nutrition outcomes include socioeconomic status of the family, literacy levels, influence of relatives, and access to safe nutrient-rich complementary foods. **Barriers to IYCF can be broadly divided into primary caregivers' knowledge about breastfeeding, primary caregivers' knowledge about complementary feeding, influence of culture custodians, and pattern and burden of other responsibilities** (Nankumbi and Muliira, 2015)**.**

Lack of knowledge impacts critical aspects of child feeding such as early initiation of breastfeeding, exclusive breastfeeding for six months and timely introduction of age appropriate complementary feeding (Nguyen et al., 2011). Knowledge deficiency also makes itself apparent in other aspects such as believing that monitoring of nutrition needs should start when the child starts eating solid foods, when a child is sick, or when a child is undereating or overeating. Inappropriate breastfeeding practices stemming from lack of adequate knowledge were also reported such as initiation of breastfeeding immediately after delivery, frequency of breastfeeding, and exclusive breastfeeding. Lack of knowledge about IYCF practices has been reported in other developing countries as well (Nguyen et al., 2011). It is also associated with insufficient time to feed the child or insufficient consumption of complementary foods. In India, one in four newborns receive breast milk within one hour of birth, fewer than half (46%) of infants under six months are exclusively breastfed and just under half of infants (43%) are not fed appropriately with both breast milk and complementary foods (World Bank, 2011). A lack of adequate knowledge also signifies an inability of health professionals to effectively use available resources to enhance primary caregivers' IYCF knowledge (Nankumbi and Muliira, 2015).

Maternal factors such as working outside of home, level of education and the mother's health status had an important bearing on breastfeeding and IYCF practices (Nguyen, 2011). For mothers working outside the home, exclusive breastfeeding was 14 times higher for women who had not returned to work. Mothers having higher levels of education are more likely to exclusively breastfeed and have longer duration of exclusive breastfeeding. Besides this, maternal health status such as feeling weak, tired and being in pain are shown to affect breastfeeding (Nguyen, 2011). Low status of women in India contributed by low levels of

education, early marriage and child bearing, inequitable power relations and inadequate knowledge of critical feeding and caring practices compromise the quality of child care (World Bank, 2015).

Influence of culture custodians such elder members of family/community, mother-in laws, grandparents, and others are also a significant barrier to use of proper IYCF practices. These cultural practices seem to be entrenched in the fabric of the collective thought process of the community and hence shape the mother's perspective on child feeding practices. This is a unique challenge as caregivers such as grandmothers have strong social networks and exercise significant influence on practices relating to pregnancy and childcare (Nankumbi and Muliira, 2015).

Pattern and burden of other responsibilities leading the primary caregiver to not be able to allot enough time for exclusive breastfeeding the infant or give their children adequate food on time. Usual meal frequency for children is 2-3 times/day which varied depending on other activities of and responsibilities of the caregiver. The primary caregivers are burdened by high household chores which intensify in the harvesting/agricultural seasons. While receiving no support from the male members of the family towards meeting childcare needs or reducing the burden of household responsibilities. Encouraging male members of the households helps address pattern and burden of other responsibilities faced by primary caregivers (Nankumbi and Muliira, 2015).

Missed opportunities to enhance IYCF including health education and peer support groups can help increase caregiver's knowledge of breastfeeding and IYCF practices. Such interventions can be run in antenatal and postnatal clinics, child immunization clinics and community outreach programs (Nankumbi and Muliira, 2015).

In light of present literature, this study seeks to explore the extent and sources of knowledge, attitudes including beliefs and barriers to proper IYCF practices and use photovoice to document prevalent breastfeeding and complementary feeding practices in the communities participating in this study.

CHAPTER III

METHODS

Study Population: The study population consisted of women of child-bearing age (20-35 years) having children 6-18 months of age and the community (household) members who were related to the women. The community members included the husband, mother-in-law, sister-in-law, brother-in-law or father-in-law. Comprising of a total of 30 participants in two distinct communities of the West Champaran district in Bihar, India (Table 1).

Table 1: Study Population and Sample Size

Study Group	Location	Sample Size
Control	Jawahirpur (Urban)	8 mothers, 7 community members
Intervention	Damrapur (Rural)	8 mothers, 7 community members
Total		30

Sampling Strategy: Participants were selected from households participating in the larger Emory-CARE India IFHI study. They were purposively selected on the basis of caste and age of the youngest child. We included participants from the General, OBC and SC castes and having children between 6-18 months of age. The control group was in Jawahirpur, which is an urban community located around an hour away from the nearest city of Bettiah. The intervention group

was in Damrapur, a rural community located around 2 hours from the nearest city of Bettiah. 'Control' refers to households receiving only IYCF counselling through the Anganwadi workers. 'Intervention' refers to households receiving MMP sachets in addition to IYCF counselling. In the control group 8 women had children of 6-12 months of age while 2 women had children of 12-18 months of age. The participants represented General and SC castes. In the intervention group, 5 women had children between 6-12 months of age and 4 women had children between 12-18 months of age. The participants were representative of SC and OBC castes.

Ethics, Approvals and Consent: Approval for conducting the research study was sought from the Institutional Review Board (IRB) at Emory University, Atlanta. For the focus group discussions, verbal consent was sought from the participants at the beginning of the discussion. For the use of cameras and photographs, a written photo ethics consent form was signed by all participants prior to camera distribution and training.

The Photovoice Process: Photo voice was used to document the community's experience with the multiple micronutrient powders (MMP) as well as complementary feeding. Photovoice is "*a participatory action research (PAR) methodology used to catalyze personal and community change by creating and discussing photographs*."(Wang and Burris, 1994) It is a relatively new and innovative method of participatory research and has been shown to be effective for people with lower literacy skills to communicate their experiences, challenges and perceptions (Chilton, 2009). Photo voice is also instrumental in exposing issues which otherwise remain hidden from the policy makers' view as it encourages personal reflection and self-awareness (Chilton, 2009). Participants are encouraged to document their daily activities using the cameras which may focus on the needs and assets of the community or individual. The methodology also encourages critical self-reflection while the participants describe their experiences using the pictures as well

as facilitate and generate discussion as a group (Wang, 1998). The process enables participants to represent their everyday realities, promotes dialogue and reflection about community needs and finally inform policy by reaching out to decision makers (Wang, 2006).

For the purpose of this study, Photovoice was carried out in 4 stages involving a combination of focus group discussions and the camera training & collection.

Stage 1: Focus group discussion 1: This discussion was aimed at introducing the participants to the study objective as well as to provide a context and background to what is expected from them in the later stages of the study including the use of camera. The discussion was initiated by a "Nutrition-tree" activity which explored the extent of the participant's knowledge about the causes and effects of malnutrition in their community. The activity was carried out as an ice-breaker to make the mothers more comfortable expressing themselves in the discussion. Participants were asked to label the tree such that the 'roots' signified causes of malnutrition and the 'branches' signify the effects/consequences of malnutrition. The questions that followed during the discussion were aimed at assessing food access, complementary feeding practices and MMP use (only in intervention group). Towards the end of the discussion participants were informed of next steps which included the camera training and distribution. Participants were also instructed to click pictures of themes they had discussed during the discussion which included breastfeeding and IYCF practices prevalent in the community.

Stage 2: Camera distribution and training: The purpose of this stage was to acquaint the mothers with the use of cameras and also to re-enforce the themes discussed in focus group discussion 1. For the control group *door-to-door* visit were conducted. Due to logistical constraints, the participants/their family members were invited to the Anganwadi center in the

intervention group. Training was provided to the mothers as well as family members. Family members included husbands, brother-in-law, sister-in-law and daughters (educated/school going age). Family members were included in the training alleviate concerns regarding the women not being comfortable operating digital cameras themselves. Furthermore, it was assumed unrealistic for the mother to photograph herself while feeding her child. The mother and her family were given 5 days to click the pictures. To re-enforce the themes generated in focus group 1, participants and their family members were given generic instructions to click pictures while attending to their infants, preparing a meal for the family, maintaining the household and using the MMP sachets. A *photo-check* was conducted by the research team on the third day to evaluate the quality of the pictures and to see if the pictures are being clicked according to the instructions provided. This was also done to address any technical concerns the participants had with the camera.

Stage 3: Camera Collection: After the 5 day process of clicking the photographs, the cameras were collected from the households. *Door-to-door* visits were made to collect the cameras in both groups. The mothers were also asked to select one picture they liked most which would later be given to them as a token of appreciation for their participation in the study. The photographs collected from each participant were broadly categorized into breastfeeding, complementary feeding, cleanliness, cooking practices and MMP use. These were divided by the researcher based on the photographs collected as well as the themes generated during focus group discussion 1. The final photograph count in the control group was 577 photos and in the intervention group was 615 photos.

Stage 4: Photo Discussion: The purpose of this focus group was for the mothers to discuss the photographs they had taken. The photographs were printed and returned to each mother. Each

participant was given one picture from each of our 5 categories (4 categories in case of control group). A *semi-structured* interview guide was used for the purpose of this discussion to allow room for the participant to present her perspective. The discussion was facilitated using the photographs and participants were asked to describe their pictures, compare their pictures in groups of two and choose the best picture and tell what relevant themes about their community the picture represents.

Stage 5: Community Exhibit: The community exhibit gave the household members (mother-in-law, sister-in-law and husband) a chance to express their views on complementary feeding and nutrition of their children. This helped us gain a deeper understanding of the nutrition practices in the community. The community members were also asked to express their views on the pictures clicked and the photovoice methodology.

Data Collection: Data collection was done by the researcher and one trained research assistant. While the focus groups were conducted by the researcher, notes were taken down by the research assistant. The focus groups were conducted in the native language, Hindi. Focus groups were chosen as the methodology of choice for this research study as it complemented the photovoice process in bringing out community norms and barriers associated with IYCF practices and MMP use.

The focus groups were audio-recorded and later translated and transcribed verbatim into English. Photographs from each mother were printed out for the purpose of the discussion such that each mother contributed 1 photograph to each of our picture categories of breastfeeding, cooking practices, complementary feeding, cleanliness/hygiene and MMP use. The remaining pictures were stored in a password protected hard-drive. The printed picture were returned to the

participants at the end of the community exhibit in both groups. In addition to this, all mothers were asked to pick a photograph of choice which was printed and presented to them as a token of appreciation for participating in the research study.

Qualitative Data Analysis:

The analysis is done using MaxQda 11. Key patterns and themes emerging from the transcripts were identified by memoing the data. In addition to this, inductive codes pertaining to the research question, identified during the literature review and the data collection were applied to the data to fully answer the research question.

The 4 codes used are:

- **Knowledge:**

  Any reference to the participant's knowledge/information regarding the etiology and effects of undernutrition in their children. This also included the participants knowledge of signs/symptoms associated with malnutrition. Sources of such an information, for example, Anganwadi worker, Family, Self etc. was also include in this coding category. Participant's knowledge of IYCF practices i.e. how / when / what needs to be done in their community were also included in this coding category such as "*Do you **know** when to start introducing complementary foods to your child?"*

  In accordance to the variety of responses in this coding category, it was sub-coded into: *Sources of knowledge, Causes, Effects/Signs/Symptoms, Practices*

- **Attitudes**

  Any reference to how the participants *feel* about children's nutrition and feeding. This could include a stance, belief, or mode of behaving. Also includes a settled manner of thinking, feeling or behaving which reflects their state of mind or disposition and has the potential to predict behavior. The category stands synonymous with the participant's perspective, outlook, inclination, approach, temper or reactions. For example, *"Do you **feel** you get enough information from the Anganwadi worker?"*

  The discussion was facilitated using the photographs collected from the participants. This coding category is sub-coded into *Opinions, Perceived Barriers* and *Perceived importance of nutrition recommendations* depending on the participants' views and description of the pictures.

- **Practices**

  Any reference to how they *do* things pertaining to their children's nutrition and feeding. This coding category includes the actual *application* / *use* of ideas, beliefs and methods as opposed to theories relating to it. The photographs were used to supplement the discussion for this category and included sub categories of Breastfeeding, Complementary Feeding, Cooking practices, Cleanliness/Hygiene and MMP use. These categories were defined by the researchers on the basis of the photographs collected from the participants. Discussion centered about description of the photographs by the mothers, why they clicked that particular picture, what is happening in the photograph and how it is relevant to the practices in their community. This also included practices the

participants would like to adopt in their households after discussion their photographs with each other.

- **Photovoice**

  Participant's experience using the photovoice methodology, their experiences with the camera and through the training phases were include in this coding category. How they used the camera, who clicked the photographs, what they liked about the methodology and if they would like to be a part of such a research in the future were issues addressed by this category.

Using the above mentioned technique and codes will provide a contextual understanding of knowledge, attitudes and practices towards nutrition and complementary feeding of children between 6-18 months of age in Bihar, India.

CHAPTER IV

RESULTS

Knowledge, Attitudes and Practices were compared across the comparison categories of Control group vs Intervention group. Within these groups, comparative analysis was further done between Mothers (primary caregiver) vs Community Members (Husband, mother-in-law, sister-in-law to primary caregiver)

KNOWLEDGE

Questions were targeted at gauging participant's nutritional knowledge across categories of Sources of knowledge, knowledge regarding the causes of malnutrition and effects of malnutrition.

Knowledge in Control group

Sources of knowledge

Sources of knowledge among the **mothers** included the Anganwadi workers, ASHA, they also relied on other family and community members to "see what everyone else" and practice accordingly. According to most mothers the FLWs visit merely *once or twice* in a year and provide medicines and information. The participants find the information provided by the FLWs and the pamphlet (distributed by the FLW) to be useful. The FLW provide them with information regarding initiation, frequency and type of foods to be introduced during complementary feeding. A frequent concerns among our participants was a *lack of coverage* by the Anganwadi workers. The mothers believed that the FLW does not serve their best interests and does not visit them to provide information. Some of the mothers, whom the FLW visited

mentioned that it is because their houses are nearby and hence easy to visit while the homes in the interior of village are not visited and the FLW returns from the outset. They however mentioned that when the FLW visits, she provides "good" information. The mothers would like to have more information on IYCF practices and would prefer to have information in form of pamphlets circulated. Even though FLW visits less often, they acknowledged that it is difficult for FLW to visit more often.

(From mothers in the control group)

"We see what others are giving to their child, and we know that but we don't have money."

"She gives right information. Like start feeding the child after six month and give water to the child form the time of birth itself."

"ASHA doesn't tell us anything, she just take bribes. She does not help even pregnant women as well."

(About the pamphlet)

"It was written that the child should be given food in clean bowl; food should be touched after cleaning hands with soap. It was written that these are the things which can be given to the child."

"What should be given to the child that was also written."

In contrast to the mothers, the **community members** relied mainly on information gained *on their own* and other family members/elders. The community members also acknowledged a dearth of information regarding IYCF practices. They had also not received any pamphlet regarding IYCF counselling. The community members also believed that their interests are not

served well by the FLWs and government resources are used for the FLW's personal gains. In addition to this, the CHW does not provide them with information / counselling as well.

(Mothers-in-law for sources)

Interviewer: "if the process of starting breastfeeding or starting of external food is not told to you by Anganwadi, then who told you these things or from where you got this information?

Mother-in-law: "By ourself"

"From my own heart"

"Yes, who will come to tell us these things"

"It is the god that gives us"

Causes and Effects of malnutrition

Among the most common causes pf malnutrition enumerated by the mothers were a lack of nutrition during pregnancy and lack of cleanliness and sanitation. Other causes mentioned included illness or diseases and delayed treatment for the same. Our participants acknowledged the importance of giving their infants a proper diet.

(Mothers from control group)

"When the child is in the womb, if the mother does not get complete meal then in future the child gets malnutrition."

"Medical treatment is not given on time, if child is not fed well... if proper food and drinks is not given..."

"Bathing, washing and keeping things clean, if these this not done it may cause sickness to the child. "

The mothers discussed the effect of improper nutrition including effects on physical appearance and function such as difficulty in walking or sitting, sickness, weakness and ill-health, mental/psychological effects such as difficulty in studying in school, completing tasks and not being able to perform well, inability to engage in play and abnormal development. The mothers acknowledged the importance of proper nutrition which will help in proper growth of their children.

"The child will not be able to do any work or job, may not be able to study."

"The child will not be able to play and will not be normal."

On the benefits of proper nutrition, the mother mentioned that proper care of their children will result in overall well-being, proper and accelerated development and increased strength of their children. To achieve this, they acknowledged the importance of giving a proper diet and maintaining hygiene in the household.

"Blood will be formed and child will become strong."

"Child will become strong and will start walking quickly."

"No, if cleanliness is kept and proper food is given then it will be good."

Knowledge in Intervention group

Sources of knowledge

The common sources of knowledge for mothers in the intervention group included the ASHA and Anganwadi workers. All participants mentioned that they meet with the Anganwadi every day and she provides them with information on a variety of topics such as initiation of breastfeeding, exclusive breastfeeding, IYCF practices and cleanliness which they find useful.

"Anganwadi worker provides us this information. Child above six months should be given food other than breast feeding. By smashing the rice and sprinkling the powder and the mixing it food should be given. Hands should be washed by using soap."

"Yes. Rice should be lukewarm when we feed it to child. It should be mixed with some curry. If sometimes child do not vegetable curry, than we should add some salt and other things, which are liked by child. It should be mixed in child's food."

"A lot of things she says"

In addition to this, the Anganwadi worker also provides them with information relating to MMP use which they find adequate and helpful to make use of the powder.

(About MMP from Anganwadi worker)

"That she discuss with us in great detail."

The participants also rely on other family members especially the elders as a source of knowledge for nutrition practices in the household.

"Who will say this... mother-in-law and father-in-law say this; mother and father say this, who else will say such things. "

About the pamphlet provided by the FLW, the mothers mentioned that they receive it but only those who can read it are able to understand the information.

(About the pamphlet)

"Only those who can read will understand this information."

Causes and effects of malnutrition

The causes of malnutrition as discussed by the mothers in the intervention group included weakness due to improper diet and ill-health due to infections and unsanitary conditions.

(From the Nutrition tree activity, which was done in the beginning of the discussion where the participants were asked to label the roots and branches of a tree (on a white board). The tree trunk signified *kuposhan,* meaning "malnutrition", the 'roots' of the tree referred to the cause of malnutrition, and the "effects" of malnutrition were signified by the 'branches'.)

"There is weakness because roots are not strong."

The consequences of malnutrition mentioned by the participants included weakness and physical ailments such as problems walking/sitting.

"Child becomes weak only when he is infected by some disease. Because of being ill child become weak and cannot walk properly."

"The child will have problem in walking or even in sitting."

(During Nutrition tree activity, from a mother in the intervention group, when being asked to further label the tree diagram.)

"*If you will ask so many things to us, how we rural people will know all that. Timely food should be given. One should be take care of the child properly, if we feed the child properly, there will not be much problem.*

Table 1: Comparison of Sources of Knowledge

	CONTROL		**INTERVENTION**	
	Mothers	**Community**	**Mothers**	**Community**
Sources of Knowledge	Anganwadi, ASHA, family and community members. Mothers find the information provided by the FLWs and the pamphlet to be *useful.*	The community members rely on their own knowledge. Complained of infrequent visits and services.	ASHA/Anganwadi Daily visits by the FLW Information provided on breastfeeding, IYCF practices and MMP use.	Anganwadi Worker

ATTITUDES

For the purpose of this study, Attitudes include opinions/beliefs, barriers as well as perceived importance of nutrition recommendations. Barriers to proper IYCF practices in West Champaran, Bihar included Lack of Coverage by FLWs, lack of decision making by mothers/women, inadequate food access, and financial constraints.

Lack of coverage by FLWs

Coverage in Control group

Both the Mothers & Community members cited infrequent and no visits by the FLWs. While a few mothers claimed that the Anganwadi visits them, they acknowledged that distance from the Anganwadi center could be a hindrance to coverage by the FLW. They speculated that *only nearby* houses are visited to avoid official complaints. It was further reported by the community members that the nutritious food provided by the government is not distributed in the community. The participants believed that the funds provided by the government for the people are made use of for the FLW's own personal gain. In addition to this, they saw the ASHA as of little help to pregnant women. The community members mentioned a complete lack of any cordial relationship with the FLWs. They reported that the Anganwadi does not visit or provide any information to the community members. In such a situation the participants rely on their own knowledge to feed and take care of their children.

(From Community fad, control group)

"Anganwadi, she is not good, the money which comes for the food of children is used by her for her own purpose. And there is no other thing to say.

"No, we don't have any relationship with her. She just wants to fill her pocket."

"If we ask anything, she starts fighting that if government will send then only she will give. And she wants of fill her home."

"It is a norm that pregnant women or lactating mother should be given THR (Take home ration) but nothing is given here."

(From mother's FGD, control group)

"Then she never came to give information."

"When she has to give medicine then only she comes otherwise she does not come. And she calls to Anganwadi Centre for vaccination, there she speak about other things as well."

"The thing is that when there is any enquiry, only nearby household are called for so she visit those houses. Our house is at inside area so she never comes to our place."

Coverage in Intervention group

Both the mothers & the community members enjoy a good relationship with the FLW. They reported regular visits and information provided by the FLW and were satisfied by the information she provides.

(Mothers in intervention group)

"Discusses this in great detail" (about MMP)

"Almost every day. She comes to visit our home. Our home is near the Anganwadi"

"My home is bit far away."

"Does she come to meet you?"(interviewer)

"Yes."

Table 2.1: Comparison of FLW Coverage

	CONTROL		INTERVENTON	
	Mothers	**Community**	**Mothers**	**Community**
Coverage by FLWs	Infrequent/no visits, distribution of medicines but no information/knowledge is shared. Nearby houses are visited to avoid official complaints, Nutritious food provided by the govt. is not distributed in the community ASHA is not of help to pregnant women.	Lack of any cordial relationship with the Anganwadi worker. The Anganwadi does not visit or provide any information to the community members. Rely on their own knowledge to feed and take care of their children.	Enjoy good relationship with the Anganwadi worker. Regular visits and information is provided by the FLW.	Relationship with Anganwadi is good, are satisfied by the information she provides.

Decision Making

Decision making in Control group:

Decisions regarding what is cooked at home and what is brought from the market are generally taken by guardians (father-in-law/mother-in-law) or *the head of the family* (usually the eldest person in the household), if not the guardians it is the husband. In some homes, decisions are taken as per the mother's choice and her wishes are taken into account. In one such case this was because the husband would be working away in the city and the household did not have any in-laws. This was a case of a mother living with her four daughters. So, it was either the mother or the daughter who decided. Groceries/food stuffs are generally brought by father-in-law/guardian/husband.

A few *community members* mentioned that it is the *mother* of the child who decide what will be made at home. Otherwise, the mother's wishes are respected but decisions are taken by the elders in the family. Food is brought by the father-in-law/mother-in-law or the husband.

In both groups, it is the daughter-in-law (mother) prepares the food, if not it is the mother-in-law.

(From community fgd)

"If the mother of the child wants to give khir, milk or halwa or anything else, do you listen to her?"

"Yes, if it possible at that time, it is done and if that is not available or not possible, it is not done."

"Yes, whatever she will say will be cooked at home. Whatever vegetable she says, whatever meat she asks for. Everything is cooked." ("she" is the daughter)

(From mother's fgd)

"Things are cooked as per our choice as well; whatever we say, things are brought accordingly and I cook whatever I want to eat."

"It is always the choice of my father-in-law and nothing by my choice"

"Means, Father-in-law bring grocery from the market and as per the direction of the mother-in-law it is cooked. There is no my choice."

"I cook whatever I think is good for the child and he brings things accordingly"

"No, there is no one to refuse or stop. It is about my choice. Whatever will be my choice, I cook accordingly."

Decision making in Intervention group

Mothers in the intervention group said that groceries and food are brought by *guardians* (father/mother-in-law), decisions around what is prepared for meals is taken by them as well , if guardians are not there the *malik/bhaisur* (elder brother to husband) decides. Sometimes the husband and the mother decide.

The mothers wishes are *sometimes* respected otherwise she has to go along with what the elders say. There are no restrictions on her as to what she makes for her children/household members. Decisions are also based upon the *nutritional value* of the food i.e. if the mother thinks it is good for the child's health.

(Mothers' fgd)

"We say that something want to cook, if it is approved we cook otherwise let it be. It all depends on what guardian says".

"Wish of the guardian. Sometimes it depends on my wish."

"We think that if we will give good food then this will form blood in the body of the child."

A few of our participants from the ***community*** *group* mentioned that it is the mother who decides and assumed full responsibility of feeding and taking care of her children's needs. More commonly, it is either the mother-in-law /father-in-law. If not the in-laws, the husband decides. All family members including the mother wanted to ensure proper growth and development of the child.

(Community fgd)

"Daughter or daughter-in-law asks the guardian that what will be cooked."

"Who will take this decision for the child... it is the mother."

"Anyone else will not come from outside to say that this has to be given or now you should give bath, it is all done by mother".

Table 2.2: Comparison of Decision Making across groups

	CONTROL		INTERVENTON	
	Mothers	**Community**	**Mothers**	**Community**
Decision Making	Decisions taken by *guardians* (father/mother-in-law), husbands. Groceries/food stuffs brought by father-in-law/guardian/husband.	Decisions taken by *the head of the family.* The mother's wishes are respected. Food is brought by father/mother-in-law or the husband.	Decisions taken by the guardian, *malik/bhaisur* (elder brother to husband), sometimes the husband and the mother decide. The mother's wishes are *sometimes* respected. Food is brought by guardians.	It is either the mother/father-in-law or husband who decides. Only sometimes the mother decides.

Food Access

Food Access in Control group:

Mothers and Community

A variety of food stuffs are usually available in the market such as "biscuit, milk, *cerelac, complan (*milk powder), milk products, and fruits". If not in the village, they have to travel to the nearby town (*Lauriya).* Certain food stuffs such as fruits, *Horlicks* (milk powder), animal products (eggs, meat, fish) and sometimes even milk are not available and need to be brought from nearby town (Lauriya and Bettiah). The participants cannot afford fruits as they are expensive and need to be brought from the nearest city of Lauriya and Bettiah. The travel also adds to their financial burden. Cooking gas is not available and food is made on firewood. Irrespective of availability, financial concerns are predominant.

"Potato, brinjal , ladyfinger, cauliflower, string beans…. Everything is available but money is required to buy."

"Fruits and other things we buy form out side village"

"For us Lauriya is nearest and if we will go to Bettiya need money for travelling"

"No, we don't have gas stove."

"Gas is not available here."

Food Access in Intervention group

Mothers and Community

The *mothers* mentioned various foods, i.e vegetables, wheat, pulses, rice, milk, milk products, animal products such as meat, fish which are available in the village. Fruits are not available and have to be brought from afar (nearest town, *Narkhatiyaganj*). They also feel limited in their capacity to afford food especially expensive food items such as fruits. At times when they are able to afford those, unavailability is a concern. According to the *community members*, fruits and animal product like meat, fish are not available in the village and need to be bought from the market.

"Yes, rice, pulses and vegetables and all other things are available here in the village."

"Fruits are not available here, apart from that everything is available here."

"Those who have interest in having fruits they will buy it whether it is cheap or costly, but we have problem of money and we have to go far to get fruits."

"Meat and fish is not sold in the village, it is bought from the market."

Table 2.3: Comparison of Food Access across groups

	CONTROL		INTERVENTON	
	Mothers	**Community**	**Mothers**	**Community**
Food Access	A variety of food stuffs are available. If not in the village, they have to travel to the nearby town. Financial concerns are predominant.	Fruits, *Horlicks* (milk powder), animal products (eggs, meat, fish) and sometimes even milk are not available and needs to brought from nearby town (Lauriya and Bettiah). Cooking gas is not available and food is made on firewood.	Fruits are not available and have to be brought from afar. Limited in their capacity to afford food, at other times different kinds of foods, especially fruits are not available.	Fruits and animal product like meat, fish are not available in the village and need to be bought from the market.

Financial Limitations

Financial Limitations in Control group

Mothers and Community

Participants in both our groups reported that they are unable to afford a "variety" of foods. Expensive food stuffs like fruits and animal products such as meat, fish etc. are fed less often, the affluent spend more and give richer food to their children, while the poor cannot. They acknowledged that there is no dearth of information but they are limited in their capacity to provide for their children. The financial limitations of our participants affected their ability to

provide a varied diet for their children, affected the kind of food they make available to their children and the frequency of feeding their children.

Financial limitations and variety:

(On providing a variety of foods to children)

"When one is capable then only can cook differently."

"How poor people can give different kinds of food?"

"I don't give."-

"Why you don't give different things?" (interviewer)

"We don't have money."

Financial limitations and "expensive" foods:

"As you think that we are having all kind of fruits, that is not the case. Only one person is there to earn and ten are dependent to eat. So, that is not possible."

"Those who are capable can spend Rs 5000 for the food of the child, those who are not capable give vegetable and rice, and those who are not capable gives only salt and rice."

"For cow's milk money is required and in my milk there is no money required."

The participants also mentioned that if financial conditions are not limiting they would like to buy "nutritious" food for their children which according to them included milk and milk products, fruits and commercial health drinks such as Horlicks.

"We will buy nutritious food for the child."

"It is milk, curd, fruits, horlics (health drink)"

"Apple, Cerelac (Milk food for child). If money is there everything can be bought."

In addition to this, money also limits their ability to feed their child thrice a day (which is customary in Indian households). There are also times when due to lack of availability of food, they go to sleep without food and on an empty-stomach.

"We see what others are giving to their child, and we know that but we don't have money."

"When there is nothing available we sleep like that only",

"Sister, we are not capable, so do not cook three times."

Financial Limitations in Intervention group

Mothers and Community

Similar to the control group, the participants mentioned that giving a variety of foods was not possible, because it is expensive, especially fruits. They acknowledged that if money is *not* a consideration, they would like to feed a variety of foods to their children such as, "fruits, sweets, biscuits, vegetables".

<u>Financial limitations and variety:</u>

"We are not that capable to feed all the things, those who are capable give to their children."

"Those who has capacity and resources are giving different things to their children and those who does not have such capacity, can't give."

Financial limitations and "expensive" foods, cooking gas:

Vegetables which are cheap are most often bought. Cooking gas is available but none of our participants could afford it and all of them use *chulha* (firewood) to prepare food.

"We eat this only"

"How many times a week Ghewera (green vegetable) is used for curry?"

"Because it is cheap, so, almost daily."

"Yes, few do not have money and few do not have the skill." (for using cooking gas).

"Few are rich who can buy gas and many are poor so can't buy gas"

Table 2.4: Comparison of Financial Limitations across groups

	CONTROL		INTERVENTON	
	Mothers	**Community**	**Mothers**	**Community**
Financial Limitations	Unable to afford "variety" of foods, expensive food stuffs like fruits are fed less often. Food security could be a concern. Acknowledged that there is no dearth of information but they are limited in their capacity to provide for their children.	Unable to afford expensive food items such as fruits an animal products. Cannot afford to give a variety of foods.	Variety of food not possible, especially expensive foods such as fruits. Vegetables which are cheap are most often bought. Cooking gas is available but none of our participants could afford it and all of them use *chulha* (firewood) to prepare food. Financial concerns predominate in making choices.	Unable to afford "variety" in diet. Those who can afford, feed different foods to their children others cannot. Cooking gas is available but cannot be afforded.

Practices

Breastfeeding

Control group

Mothers and Community

The child is put to breast as soon as the mother starts lactating (within 2 hours after birth) which is usually an hour (or half) after birth. Frequency of breastfeeding ranges from 2-3 times/day or whenever the child cries and there is no limit to the number of times in a day an infant is breast fed. Herbal potions such as *ghutti* or honey are given only when it is possible/affordable/prescribed by the doctor. In addition to breast milk, cow's and buffalo's milk are also given.

On being asked about initiation of breastfeeding, the community members said that it was initiated as soon as the mother starts producing milk for the newborn and that the newborn is given the mother's first milk (colostrum). A few members mentioned initiating it after 3 days but on further probing reported initiating within 2 hours after birth.

(On initiation of breastfeeding, community fgd)

"And when do you start giving mothers milk, after how much time after birth?

"3 days"

"When the mother start lactating from then it is given. And it does not start immediately."

"Someone has said 3 days, few minutes earlier." (interviewer)

"No, that is not the case; it is all about the lactating of the mother."

"Within 2 hours the child starts sucking the breast for milk."

"As per the norms first milk of mother should be given to the child."

"Everyone acts as per their knowledge but what I know is that the milk should be given immediately after the birth."

"Earlier warm water was given or other's milk until mother start lactating. But in these days only mother's milk is given."

"If money is there janam ghutti (herbal potion) is given otherwise it's only the mother's milk."

"If doctor has prescribed, then have to give at that time. Latter it is not."

Breastfeeding (Control) *"In this (picture), I am breastfeeding the child."*

Breastfeeding in Intervention group

Mothers and Community

Similar to the control group, breastfeeding is started immediately after birth or an hour after birth and infants are breastfed whenever need be. There is no set number of times the children are breastfed but whenever the child demands it. In addition to mother's milk, cow's/buffalo's milk is also given. In such cases, milk, bread and sugar are mixed and smashed together and given to the child

"When do you start breast-feeding your child after birth?"

"Immediately after birth"

Breastfeeding (Intervention)

Table 3.1: Comparison of Breastfeeding across groups

	CONTROL		INTERVENTION	
	Mothers	**Community**	**Mothers**	**Community**
Breastfeeding	Frequency of breastfeeding ranges from 2-3 times/day or whenever the child cries. Breastfeeding is initiated *an hour* (or half) after birth.	The child is put to breast as soon as the mother starts lactating (immediately – 2 hours after birth), initiating breastfeeding after 3days was also mentioned by one of the participants. Infants are fed as and when required. Herbal potions (*ghutti)* are fed at times.	Breastfeeding is started immediately after birth or an hour after birth. Infants are breastfed whenever need be.	Infants are breastfed as and when required.

Complementary Feeding

Control group

Mothers

Most common external foods introduced include pulses, rice and vegetables (*daal, bhaat aur sabzi*). Other foods include vegetables, rice, sweets, animal products such as meat/chicken and fruits. Most commonly given fruits include mango, apple, grapes, pomegranate (depending on the season, fruits are given accordingly). Soft food is given to children. Food is not cooked specially for the child and they are fed whatever is made for everyone else in the family.

Initiation

According to the mothers in the control group, complementary feeding with external foods is started at 6 months of age. Some respondents mentioned starting complementary feeding at 9 months of age. It was started as a means to compensate for reduced milk production by the mother. Complementary feeding is started with "diluted pulses curry, rice starch mixed with rice and other foods by smashing into a thick gravy."

"When mother cannot generate milk in her body then more dependence is on external food"

"Rice and Pulses curry is for food"

"I make them laugh and play." (to feed them)

Complementary feeding (Control group)

Frequency:

The infants are fed 2-4 times/day usually in the morning, afternoon and evening.

"Rice in the morning, Bread in night, milk little three to four times."

Variety

The mothers acknowledged the importance giving a varied diet. Variety in foods included rice, bread, vegetables, pulses, fruits and animal products such as meat and fish. Sometimes energy-rich foods such as *puri-khir (deep fried bread and rice cooked in milk with sugar)* and *halwa* are also made. Depending on the seasonal availability, fruits are also given. Food is not prepared especially for the infants, they are given whatever is made for other members of the family.

"Sometimes puri-khir (deep fried bread and rice cooked in milk with sugar) is cooked, sometimes fish and rice is cooked"

"Rice – vegetables, Bread – Pulses Curry, Milk – Bread, these were the things"

"This is the season of mango, so mango, apple, grapes, means whatever is available and bought is also given to the child"

"Daal, chawal, sabji this only that we cook. Sabji, bhaat, mangoes, biscuit, namkin, cerelac. This only what else?

(on the consistency of food)

"It is soft."

"We don't give hard food to the child".

"Vegetable and rice, sweets... means whatever is fed she eats it".

"Good, very good... do you feed meat or things like that?"

"Yes"

"Only the muscle part (soft part")

Complementary feeding (Intervention)

"In this picture the child is being fed the fish and rice"

"She is feeding Cerelac and I am feeding rice, vegetable and pulses curry."

(On comparing pictures among themselves)

Community

According to the community members, complementary feeding is started the age of 9 – 10 months. This was done to meet the child's growing demand for food. Rice, bread, pulses, fruits are given as complementary foods and foods such as diluted pulses and smashed vegetables are introduced in the beginning. Food for the infant is not cooked specially, it is the same kind of food for the rest of the family members.

Initiation

Started at 9-10 months as a means to meet the energy demands of the child when mother's milk became insufficient. They also believed that mothers producing less breastmilk start complementary feeding early.

"It is not completely fixed, 9 or 10 months even"

"Why started at 9 months? Is there any specific reason for it? "

"No, there is no specific reason. But at that time mother's milk was not enough for the child then started giving external food. Otherwise those mothers having less milk start early and also give cow's milk or any other food."

Frequency

The infants are fed 3-4 times a day, in a separate bowl and as per the capacity of each child. The children are fed as and when required and the number/time of the day is not fixed.

"Whenever the child feels hungry food is given."

Variety

The community members spoke what they understand by "variety" of food products. Variety, for them includes vegetables, fruits and other energy-dense foods such as butter. They discussed the importance of giving a variety of foods to their children and described how it is achieved in the day to day lives of their children. They mentioned that they understand that giving different foods will help in the physical and mental development of their children as well as help prevent illnesses, but what they feed is also a matter of financial capability to provide for their children. Even when all kinds of foods are available in the marketplace, they are limited in their capacity to afford them.

(On what they understand by "variety")

"Means, sometimes vegetable should be given, sometimes butter and other things should be given, and at times fruits like apples and grapes should be given."

"Listen, different kind of food is good for the strength of child's bone, nutritious food will increase their strength, it will also help in increasing the height and mental balance will be good in future, there will be no sickness. But we are not capable, so can't give."

"We also feed the child so that the child can be strong, face should look good, child should be healthy, should not be sick, won't develop any disability, should walk properly. We feed our child as per our capacity."

"Biscuit and other things are also given, but it is all a matter of capability. What is not there in the market for the child: fruit is there, Horlicks is there, milk is there, but it is all a matter of capability."

"Many children do not eat spicy vegetables. So if milk is available, milk is given, if not, salt and oil is given."

Consistency

Initially, foods are introduced by reducing it to a paste like consistency but for older children (around 18 months of age and beyond), normal food is given. Animal products like meat are introduced at 2-3 years of age.

(On initiation of animal products like meat, fish etc.)

"After 2 or 3 years", "Maximum three years or two years."

"A lot of child starts eating from the age of one year itself."

(On quantity of food served to the child)

"That does not matter, the quantity is always as per the capacity of the child to eat."

"The child stops eating and start playing with the bowl or food."

Complementary feeding in Intervention group

Mothers

Initiation

According to the mothers in the intervention group, complementary feeding is initiated at 6 months of age. Foods introduced include rice, pulses, meat, fish, milk and bread.

"We start giving other food when child is of six months."

"Yes, if the child is of five months or six months, starts eating."

"Same things we also give. Pulse curry, rice, vegetables, Kheer, Halwa"

Frequency

Children are usually fed 2-4 times / day but this usually varies among households (upto 5 times). Food is given in the morning, afternoon and night/evening. A variety of foods are given including rice, pulses, vegetables, fruits, meat, fish, bread and milk.

"Three to four times"

"Five times as well. As many times as the child eats."

"First in the morning when the child wakes up, Than at 10 am, then at 12 pm, and at pm and last at night."

Variety

The different kinds of foods which are fed to infants include bread (roti), rice, vegetable, and pulses. Less often *halwa, kheer* are also given. Food is not prepared especially for the infant but it is the same food the rest of the family has.

"If rice and pulse curry is cooked, it is given to the child. If bread and vegetable is cooked, that is given to the child. And give them water"

"In a bowl rice and in a bowl vegetable curry are taken and in another vegetable is kept. So that it is not spicy for the child when mixed and given."

"Feeding the child"

"What are you feeding?"

"Rice and curry"

Complementary feeding (Intervention)

Complementary feeding (Intervention)

"After cleaning the bowl vegetable and rice is given. Whenever meat or fish is cooked that is fed. These are the things." (mother in picture)

"Same things we also give. Pulse curry, rice, vegetables, Kheer, Halwa"(mothers in FGD)

Consistency

Food is usually given by reducing it to a soft pasty consistency for the child. Vegatables, rice and pulses are all mixed, reduced by hand to a soft consistency and then fed to the child. At times bread (roti) is mixed with milk and sugar is added for taste.

"By smashing the food two or three times food is given even though one has to go out for work"

"After washing hands properly using soap, we mix food properly to feed a child. Take rice and pulse curry or rice and vegetable curry in separate bowl and then feed it to child."

"Children are given sugar milk, sometimes rice, sometimes with vegetables, in the bowl food is given, water is given in a glass."

Complementary feeding (Intervention)

Complementary feeding (Intervention)

Complementary feeding (Intervention)

"Yes, after coming back at 12 when I was sitting at the doorstep with the child, at that time picture was clicked."

Community

Initiation

According to the community members, complementary feeding is started at 6 months of age. This is done to meet the growing child's demand for food when mother's milk alone is not sufficient.

"We start giving other food when child is of six months."

"Yes, if the child is of five months or six months, starts eating."

*"Complimentary food should be given to child of **six months**. Child will start eating after at this age. It is the age of growing for child, so the more is growing physically more it will need intake in terms of food and water."*

Frequency

Children are fed 3-4 times a day (in some cases upto 5 times) which includes morning, afternoon and evening. Food is given in a bowl and children are fed separately.

"Till night three to four times food is given"

"There is no limit to children; they eat three times, four times or even five times."

"In the morning, afternoon, evening and night; by that time three to four times food is given"

"In the morning when rice is cooked, it is given to the children. And when everything is cooked like vegetables and pulses curry, child is fed again. Then at 12 o'clock again child is given food. And then in the evening child is fed again."

Variety

A variety of foods are given including milk, curd, vegetables, pulses, rice and bread. Fruits given to infants include pomegranate, apple, banana and orange. As the child grows older (around 18 months of age), everything including meat and fish is given to them.

"We give biscuit, buns and mixture and other things from market is given to the child."

"Pomegranate, apple, banana, orange, these are the fruits that we buy."

"Every day same thing is not cooked, once Pulses curry is cooked then at other time vegetable is cooked."

Complementary feeding (Intervention)

"Vegetable is cooked but by changing the vegetable item every day. Sometime only rice starch and rice is given."

Consistency

Infants are fed by reducing the food to a soft consistency by hand. For older children (around 18 moths os age), normal food is given without reducing the consistency.

"If you will give the child whatever food by smashing it, he will eat it."

"There is no need of smashing the food if the children is of one and half year."

Table 3.2: Comparison of Complementary Feeding across groups

	CONTROL		INTERVENTION	
	Mothers	**Community**	**Mothers**	**Community**
Complementary Feeding	Initiated between 6-9 months. Includes pulses, rice, vegetables, sweets, animal products such as meat/chicken and fruits. Food is not cooked specially for the child. The children are fed 2-4 times/day usually in the morning, afternoon and evening.	Initiated at the age of 9 – 10 months with diluted pulses and smashed vegetables. Rice, bread, pulses, fruits are given as complementary foods while animal products like meat are introduced at 2-3 years of age. Food is given 3-4 times and is not cooked specially for the child.	Initiated at 6 months of age. Foods introduced include rice, pules, meat, fish, milk and bread, fruits and *kheer-puri.* Children are usually fed 2-4 times / day. But this usually varies among households (upto 5 times).	Initiated at 6 months of age. A variety of foods are given including vegetables, pulses, rice, bread and fruits. For children of 18 months of age, everything including meat and fish is given to them.

Cooking Practices

Control

Mothers & Community

A variety of things which are available at home are cooked such as rice, pulses, and vegetables. Food is not cooked separately for the child. Meal for the family is prepared on firewood due to unaffordability of cooking gas.

(Mothers in control group)

"Sometimes Puri-khir (deep fried bread and rice cooked in milk with sugar) is cooked, sometimes fish and rice is cooked."

"Vegetable and rice, bread and vegetable, sometimes we eat only with salt and chilly. When milk is available milk and bread is also used for food."

Cooking Practices (Control)

Food is cooked using firewood (*chulha)* as the participants cannot afford cooking gas/stove. Food for the day is prepared in the morning. They try to give fresh food for the child's health so it is also prepared in the afternoon. In the morning it is usually rice and in the evening it is usually bread (roti). People in the village are usually are working in the fields or preparing food.

Cooking Practices (Control)

"What do you cook your food on?"

"Firewood

"From where poor people get gas stove"

"We use sugarcane leaves"

(Community members in control group)

"If the food is over, we cook at noon as well and eat fresh cooked food. Sometime with butter, or diluted pulses curry"

"In the morning, at 12 O'clock, and in the evening or whenever anyone is eating and the child asks for the food, food is given to him as well."

"Maximum in the village, rice is cooked in the morning and bread at night."

Cooking Practices (Control)

Cooking Practices in Intervention group

Mothers & Community

Leafy vegetables, vegetable curry and pulses, constitute the meal for the family. Food is prepared by the daughters/ daughters-in-law and is generally prepared in the morning. Food is not prepared separately for the children. Meal is prepared on firewood as the families cannot afford to buy cooking gas. Financial limitations also dictate the kind of food which is made at home with cheaper vegetables being cooked more often. Food is more commonly cooked in the courtyard.

"*Whatever is cooked at home is given to the child."*

"What is generally cooked?"

"Leafy vegetables, vegetable curry, pulses curry."

Cooking Practices (Intervention)

"In a cooking pot, vegetable is being stirred."

"At night generally roti is made. Rice is cooked in the morning and at afternoon rice is cooked."

"No. Whatever is cooked for the family, same food is given to child."

Cooking Practices (Intervention)

Cooking Practices (Intervention)

"We all cook using firewood only."

"We don't have it. We do not have that much of money to use gas."

"Kneading flour and my children are there, they are sitting by my side."

Cooking Practices (Intervention)

Food is generally prepared in the morning and again in the afternoon. Children are fed in the morning, afternoon and evening. A variety of foods such a pulses, rice, vegetables, and milk are given to children.

"In the morning when rice is cooked, it is given to children. And when everything is cooked like vegetables and pulses curry, child is fed again. Then at 12'o' clock again child is given food. And then in the evening child is fed again."

"Daal-bhaat, Milk, and whatever is cooked at home is given to the child."

Table 3.3: Comparison of Cooking practices among groups

	CONTROL		INTERVENTION	
	Mothers	**Community**	**Mothers**	**Community**
Cooking Practices	Things available at home are cooked such as rice, pulses, and vegetables. Food is not cooked separately for the child.	Food is cooked using firewood (*chulha)* as the participants cannot afford cooking gas/stove. Food is prepared in the morning, afternoon and evening.	Food is not prepared separately for the children. Leafy vegetables, vegetable curry and pulses, constitute the meal for the family and is generally prepared in the morning. Food is prepared using firewood.	Food for children is not prepared separately. A variety of foods are cooked including bread, rice, pulses, milk. Food is normally cooked in the courtyard. Food is prepared using firewood.

Cleanliness

Control & Intervention

Mothers & Community

The participants acknowledged the importance of maintaining cleanliness and hygiene. Cleanliness is maintained by washing and bathing the child. The mothers make sure to wash the hands and mouth of their child before feeding. Utensils are cleaned using soap and water. The mothers themselves make sure to wash and clean hands before they prepare food for the family.

"Yes, we ensure cleanliness and give food properly."

"Clean hands properly using soap before we cook. Nails are clipped properly. Before feeding child as well we clean hands properly."

Cleanliness (Control)

"We give them bath, wash properly, we cook and feed the child nicely."

"We clean our hands with soap before cooking or feeding the child."

"It is a picture of the morning time. It is of cleaning of stool (excreta)"

Cleanliness (Intervention)

Cleanliness (Intervention)

Cleanliness (Intervention)

"It is about feeding. After finishing the food it is about cleaning hands and mouth."

"The child is intrigued in something and fed, then his hand and mouth is washed properly and then given to someone."

"Cleaning utensils near hand pump"

"Ok, what do you do to ensure cleanliness at home?

"Clean utensils using soap. Clean floor properly in the house all these things are done properly"

Cleanliness (Intervention)

Table 3.4: Comparison of Cleanliness among groups

	CONTROL	INTERVENTION
	Mothers & Community	**Mothers & Community**
Cleanliness	Cleanliness is maintained by washing and bathing. The mothers make sure to wash the hands and mouth of their child before feeding.	Cleanliness/hygiene is maintained by washing hands using soap before cooking and feeding the child. Utensils are cleaned using soap and water. Nail are clipped properly.

Multiple Micronutrient Powder (MMP) use

Mothers

Perceptions

The mothers are generally satisfied with the product. As reported by the mothers, a box of powder is supplied four times in a year. The mothers felt that the information provided by the Anganwadi worker was adequate to make use of the powder. A few of our participants referred to the powder as *"davaa"* (meaning 'medicine').

"Did you face any other problem using this powder? How did you find it?"

"Good (Thik ba)"

"I find it sundar (beautiful)."
"What is beautiful about it?"
"Everything"

"Medicine is being sprinkled to feed the child"

MMP use (intervention)

Effects

The mothers mentioned various beneficial effects on their children were mentioned during the discussion such as an increase in appetite, children becoming more active, an increase in weight and improved cognition. They did not mention any adverse effects which the powder is causing to their infants.

"I feel child is becoming more active. He understands things better than earlier."

"They are looking more sundar (beautiful) now. Eats more. Becoming healthier and gaining weight as well."

"Yes, earlier child used to eat lesser, later it was increased, after that appetite increased even more."

"Earlier it was in a small bowl, now in bigger bowl. Now demands for more in bowl."

"My child also eats more food"

Use

For the mothers who give the powder regularly to their young ones, it was beneficial. A few of our participants (3-4) mentioned that their children do not consume the powder and when mixed with food, it is spit out by the infant. The mothers felt that the information provided by the Anganwadi worker was enough to make use of the MMP. They also mentioned that they feel they receive the powder in enough quantity (4 times/year). Most of the mothers give the entire packet in one meal and they reasoned it by saying that they were following the instructions on the MMP packet.

"Child does not take medicine, and spit it out."

(About instructions from Anganwadi)

"We were said that the powder is good for the child, if child does not eat it normally, it should be given forcefully as well. We should feed it along with some food. It should be mixed with rice or some other food. Have to give this powder after cleaning hands."

(On using the powder)

"After washing utensils with surf and soap, by wash hands properly by using soap. After that mix rice with oil, salt and then smash it and powder is mixed in bowl."

"Powder is good but child does not eat that."

'Spits out the powder mixed food"

"Takes out the fed morsel from mouth."

"It is written that do not give open packet in the food that's why we don't give it in three times. If the packet is open the nutrition goes away. That's why we don't give."

MMP use (intervention)

"After cleaning the bowl properly, we take rice in it. Then add vegetable curry or pulse curry, mix everything properly with powder. And then it is given to the child."

Recommendations

The mothers requested a product which their children are more receptive to. Furthermore, they said it would be nice to have more products like *Jeevan Jyoti* which will strengthen the physical and mental development of their children.

"Want to say that if something will came like this to feed the child that will be good, that will increase the mind and strengthen the bones and like."

"We want that the child should eat the powder. "

Community

Perceptions

Community members were satisfied with the product and the general consensus among the communities about MMP is positive.

"Everyone says that it is good"

"Yes, people do say that it is good."

Effects

The community members think that the MMP is beneficial for the child and hence should be used in homes. They said that the benefits include the child looking good and gaining weight, *eating more grains* (alluding to an increased appetite) and that the child is becoming healthy. They did not mention any adverse effects to MMP use in their children.

MMP use (intervention)

"Child looks good"

"It is benefiting."

"This is the benefit that child is gaining weight and eats more grains."

"It's Good, it increase the apatite of children, becoming health, cognitive ability is increasing, and becoming more active."

Use

The community members commented that on mixing the powder with food, the color changes to a *reddish* hue. They were satisfied by the FLW distributing and giving information on how to use the powder. They are given information on how to use the MMP powder by the Anganwadi worker which are as follows:

"Take rice in a bowl, mix it with powder, smash it properly and feed child with spoon."

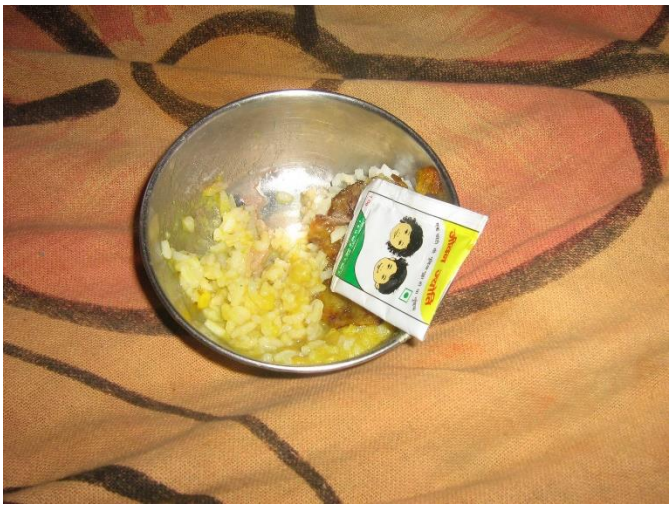
"This should be mixed in rice and pulses by smashing it, by cleaning bowl and glass in that rice and pulses should be given, and after feeding hand and mouth should be washed properly and wiped."

"Powder should be sprinkled on the rice and pulses curry and should be properly mixed and fed to the child"

"Cold food should not be given."

"Water should be given in clean glass"

"She said, if we feed a powder to child it would help in improving cognitive abilities of child. Child will become more talented. Bones will become stronger. Many more things she has said."



MMP use (intervention)

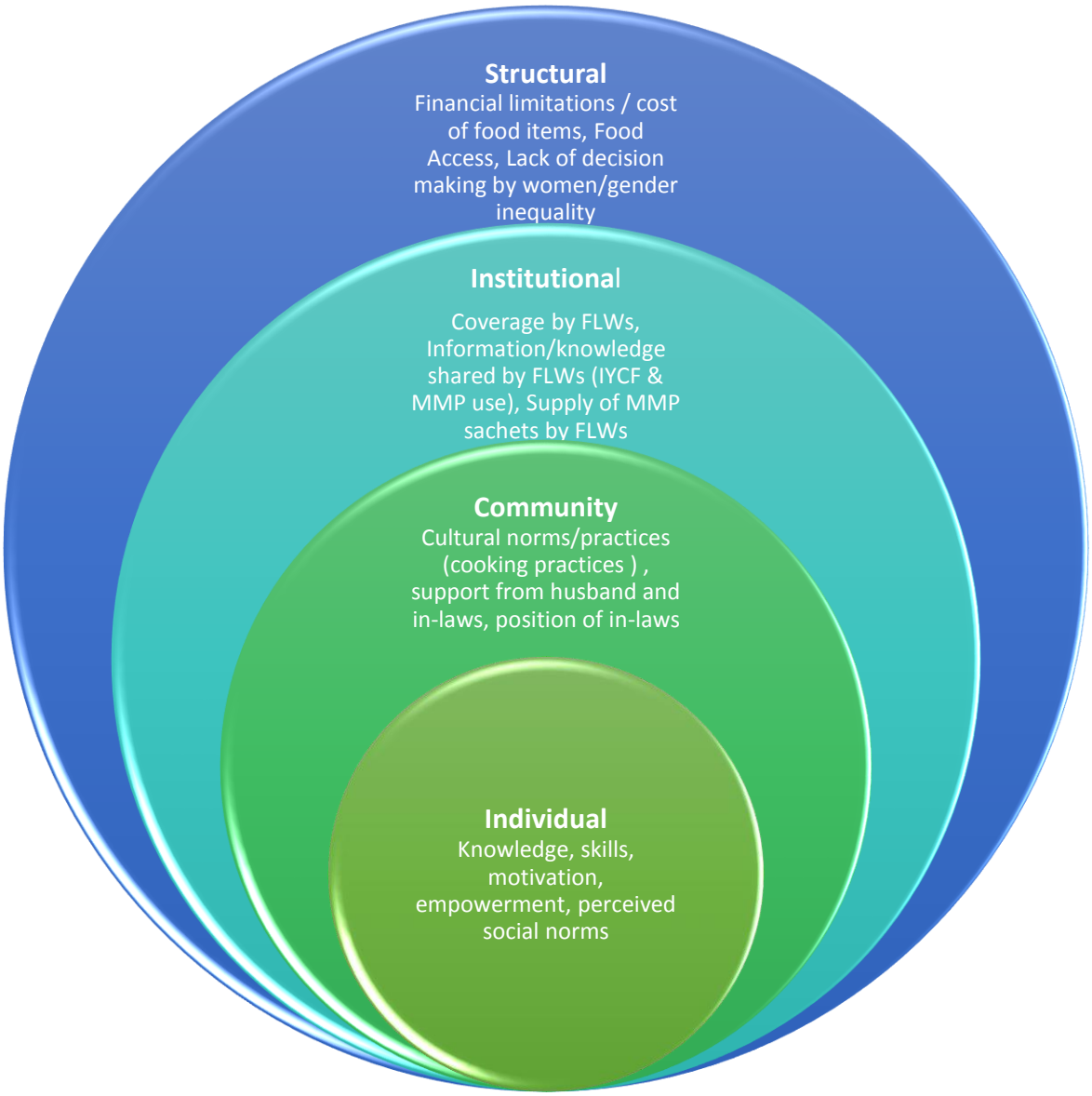
A few of the community members (2-3) commented that on mixing the powder with the food the color changes to a reddish hue.

"It becomes little red."

Table 3.5: Comparison of MMP use among groups

MOTHERS	COMMUNITY
Mothers are generally satisfied with the product. Various beneficial effects on their children were mentioned during the discussion such as an increase in appetite, children becoming more active and increased cognition. Concerns regarding the children spitting out the food mixed with powder and the powder's perception as a medicine Powder is supplied in the required quantity by the Anganwadi worker. The mothers felt that the information provided by the FLW was adequate to make use of the powder.	Community members are satisfied with the product and think it is beneficial for the child and hence should be used in homes. They said that the benefits include the child looking good and gaining weight, an increased appetite and the child is becoming healthy. The community embers commented that on mixing the powder with food, the color changes to a *reddish* hue. They were satisfied by the FLW distributing and giving information on how to use the powder.

Figure 1: Factors influencing IYCF and MMP use in West Champaran, Bihar, India



Photovoice

Control & Intervention:

Mothers & Community

Our participants enjoyed the Photovoice process and wanted to be a part of the methodology in the future. The mothers mentioned that they had not clicked pictures before this, especially using a digital camera. Camera training was provided to both the mothers as well as the family members. Most of the pictures were taken by the family members including the daughter, son, husband and brother-in-law. The participants wanted to know the purpose behind this methodology which was explained to them by the research team during the community exhibit focus group.

"The pictures of children are with cleanliness. The pictures are taken well and it came well. Whether it was of your expectation or not, whatever you will find through these pictures you will tell us and will do accordingly."

"I really liked these pictures these are beautiful."

"Yes, we enjoyed it a lot."

"Yes we liked very much"

Along with clicking the pictures, our participants also described them as well as compared those among themselves.

(On being asked to compare among themselves)

"Pictures are very nice"

"Pictures are very beautiful"

"I like it a lot, she is giving bath to the child, Very nice picture. In other she is cooking and then in another feeding the child with a spoon. In this she is breastfeeding the child."

CHAPTER V

DISCUSSION

This study aimed to evaluate the knowledge, attitudes and practices toward nutrition and complementary feeding in Bihar, India. 'Knowledge' refers to the mother's knowledge about the causes and consequences of malnutrition in their children and the importance of providing proper nutrition to their children. It also includes sources of information for the mothers and the community members such as information about IYCF gained from ASHA, pamphlet etc. 'Attitudes' in this project refers to opinions, beliefs and perceived barriers to adopting proper IYCF practices. 'Practices' refers to nutrition-related and IYCF practices in the household. Practices are depicted by the use of photographs for the purpose of this project and broad categories include breastfeeding, complementary feeding, cooking practices, cleanliness and MMP use.

Photovoice as a visual-based participatory methodology has been shown to be effective in people with lower literacy skills and little or no resources to communicate their experiences and concerns (Chilton et al., 2009). The methodology also seeks to promote critical thinking, self-reflection and exchange of ideas as means to generate discussion and effect community and personal change. Although photovoice has been proved to be effective with low-income women in rural communities (Wang, 1997), this study is one of the first to apply this methodology to investigate knowledge, attitudes and practices towards nutrition and complementary feeding.

A brief synopsis of key findings is as follows:

Knowledge

The mothers and the community members cited the frontline workers (Anganwadi and ASHA), self and family/community members as sources of knowledge. While enumerating the cause of malnutrition, the mothers mentioned lack of nutrition during pregnancy, lack of cleanliness, illnesses and delayed treatment. Effects of malnutrition on the well-being of their children included weakness, illness and effects on physical appearance, difficulty in performing tasks in school and delayed development such as difficulty in walking and sitting. The mothers acknowledged the importance of providing proper care and nutrition to their children which will enhance the physical and mental development of their children. While a few (1-2) community members mentioned delayed initiation of breastfeeding and complementary feeding, there did not seem to be a general lack of knowledge towards IYCF practices in both the communities participating in this study. This in contrast to previous studies which mention a lack of/poor maternal knowledge of malnutrition. Factors such as lack of knowledge of initiation of breastfeeding, timely introduction of complementary foods as well as insufficient consumption of external foods which are have been reported by previous studies done in India (Nguyen, 2011), were also not found to be significantly mentioned by the participants during the course of the focus group discussions in this study in West Champaran, India.

The findings of this study are also in contrast to other studies where mothers do not believe medical care to be an effective intervention for malnutrition (Saito et al., 2007). The participants not only mentioned lack of medical care as a cause of malnutrition but also described the effects it might have on their children.

Attitudes

Includes opinions, beliefs and barriers towards IYCF practices. Most commonly mentioned were food access, lack of coverage by FLWs, financial limitations and lack of decision making by mothers in the households. Both the mothers and the community members mentioned that expensive foods such as fruits cannot be afforded, finances also limit their ability to provide a variety of foods for their children as well as at times they are not able to afford the customary three meals a day. Fruits, sometimes even milk is not available in the village and had to be brought from nearby towns in case of both our groups. This also required money for travelling which discourages the participants further. In the control group more specifically, the mothers and the community members complained of the FLW not visiting or providing services and the speculation that government aid is use for her personal purposes. In both our groups decision – making by mothers regarding what is cooked in the household is taken by the *guardians* (mother-in-law or father-in-law). If not the parents, it is the husband who decides. While the mothers' wishes are *sometimes* taken into account, more often she has to go along with what everyone else says. The mothers/daughters-in-law and daughters are the ones who prepare the meal. Foodstuffs are brought by the husbands or fathers-in-law and the mother's choice is taken into consideration when buying food. The findings of this study are similar to studies conducted in other developing countries where cultural custodians/guardians (Nankumbi and Muliira, 2015), low status of women and their lack of decision making capabilities are associated with higher incidence of malnutrition (World Bank, 2015). The findings also support the assertions of prior studies where inadequate access to healthy food was associated with increased malnutrition (Psaki et al., 2012).

Practices

Practices were examined from photographs and the participant's descriptions of feeding practices (breastfeeding, complementary feeding, cooking practices, cleanliness and MMP use) during the focus group discussions. Initiation of breastfeeding occurred soon after birth (with 2 hours). A few community members in the control group reported initiating after 2 days of birth. However, more generally it initiated as soon as the mother starts lactating. In addition to mother's milk, herbal potions such as *ghutti*, cow's / buffalo's milk were also given. Complementary feeding is generally initiated at 6 months of age. A few community members in the control mentioned initiating it at 9-10 months of age as they believed mother's milk is not enough at this age and the child's energy demands increase. Foods is given 2-4 times/day to the children and it is not cooked separately for them. Food is also not prepared especially for the children and they eat whatever is cooked for the rest of the family. A variety of foods is given to the children whenever possible which includes milk, vegetable, rice, fruits and energy dense Indian foods like *kheer,halwa and puri.* Food is prepared generally in the morning. The participants try to give fresh food to their children so it is also prepared in the afternoon and evening. Because the participants could not afford cooking gas, food is generally prepared on firewood (*chulha).* Cleanliness is maintained by washing and bathing with water and soap. The mothers reported making sure to keep nails trimmed and wash hands before preparing meals. MMP is used by mixing it with food (more commonly rice and pulses). The general perception among mothers and community members is that the MMP is beneficial for the child. It has improved their children's appetite, resulted in weight gain and improved overall agility, well-being as well as physical appearance of the child. The mothers believed that adequate amount of MMP sachets and information to make use of MMP are being provided to them by the FLW. A few community

members mentioned that the food takes on a *reddish hue* on being mixed with the powder. A few mothers referred to the MMP as *davaa* (meaning 'medicine'). The mothers also mentioned their children not liking the powder and being unable to take the food mixed with the powder because it is spit out by the child.

Strengths

The photovoice methodology made use of digital cameras to give the women a means of expressing themselves. While the participants had never used digital cameras before, they were very receptive to the training provided and took to using the cameras instantaneously. The most important reason for the success of photovoice methodology within the context of this study in West Champaran, Bihar is the level and scale of *community engagement* it fostered. This can be attributed mainly to the *way* camera training was provided to the participants and household members. Since the camera training was provided door-to-door, within the participants' homes, with all family members present to witness and experiment one-by-one with the new device it created a collaborative spirit towards creating photographs for the study. Also the very process of learning and experimenting with the digital cameras was extremely engaging and established a deeper relationship between the researcher and the participants, especially when it was done inside their homes which helped establish an instantaneous rapport. This is evidenced by the fact that there was a marked increase in interactions by the mothers during the second photo focus group which was done just after the camera training and collection phase. Besides discussing their pictures which was a data-generating activity, the enhanced comfort and familiarity with the researcher played a big part in the participants being more vocal about the representation of their photographs. Additionally, photovoice also served as a way for additional issues to emerge

during the discussions. One example of this was in the control group when a mother was describing her picture and she mentioned giving frequent medicines to her infant. On further probing, the discussion revealed that the kids suffer from frequent diarrhea in the region (sometimes upto 5-6 times within 1-2 months) and need to be put on medications which are prescribed by the local doctor.

The photovoice therefore primarily is a very engaging process by way of which the participants learn new knowledge (use of cameras) and create representations of their daily lives (pictures). In the context of the methodology adopted for this study, photovoice was also a means to initiate dialogue both within the participant's households (camera training to family members) as well as among households (focus group discussions). The process further adds to the rigor of qualitative research by way of the level and frequency of interaction it offers between the researcher and the participants thereby generating richer data at every subsequent interaction.

Limitations

A limitation of the study was the number of photographs which were turned in by the participants. Since it was a total of 1192 photographs, the pictures had to be divided into categories by the research team without seeking the participant's input. This was done to make the data more manageable and did not affect the quality of discussion generated using the pictures. Furthermore, every effort was made to categorize each picture into the major themes which were recurring i.e. breastfeeding, complementary feeding, cleanliness, cooking practices, MMP use. It would have also helped to incorporate more time for field work in the timeline for this project. The entire data-collection was completed in a little over 3 weeks' time which was

not enough given the amount of data that was generated (pictures and transcripts). It would have been more helpful to revise and reflect on the data-collection instruments and more importantly, on the pictures before proceeding with the photo-discussion and community focus groups. As the study employed a combination of focus groups and the photovoice component and the pictures were described by each mother and the photographs were used to facilitate discussion in the final two sets of focus groups, it would have been prudent to label photographs for ease of data-analysis as the next step. As our participant recruitment strategy, we engaged the Anganwadi worker and in the intervention group, the focus group was held in the Anganwadi center. This could have inhibited the women in openly expressing their views regarding information about the FLW visits and counselling. Due to logistical constraints it was not possible to schedule the FGD at another venue but it would have been better had it not been conducted at the Anganwadi center. Previous literary claims of the photovoice methodology being empowering to women could not be investigated. This was because camera training was provided to all family members and it could not be investigated which of the pictures were clicked by the mothers.

Recommendations for future research

Photovoice can definitely be used as a powerful tool for qualitative research. This study used a combination of cameras with focus groups, however, it would really add to the methodology if one-on-one key interviews are incorporated into it. While conducting the focus groups it was evident that the mothers were not comfortable expressing themselves and were not particularly vocal. This could most likely be attributed to a culture of diffidence prevalent in the women of the region. On the other hand, after doing home visits and training the women one-on-one with the cameras made them more comfortable and increased interaction. It was evident that the

women were more comfortable interacting one-on-one with the researcher than in large groups especially since the researcher was a female. A stronger strategy to boost participation could also be to involve family members i.e. husbands and in-laws into nutritional interventions rather than solely targeting the mother. Since issues of women empowerment are so intricately linked to maternal and child nutrition, there could not be a more effective strategy than targeting the structures that so frequently bind her aspirations and capabilities, which in most cases are her *own family members and community.* In context of the MMP program, it is important to evaluate the extent of coverage by front-line workers in dissemination of the powder as well as providing the beneficiaries with correct instructions about usage. There is need for an increased focus on counselling provided to the mothers on proper use of MMP and addressing challenges they facing such as 'child not eating the powder' and other concerns such as the food taking on a reddish hue on adding the powder. Furthermore, perceptions about MMP use such as it being a medicine need to be evaluated for their effect on compliance with the product.

Conclusion

This KAP study using photovoice provided a situational analysis to document and identify nutrition issues and potential problems. The findings of this study can be particularly useful in informing decision-making and adapting interventions to the context by determining existing knowledge, attitudes and practices and identifying nutrition education priorities and needs. Furthermore, KAP was also instrumental in revealing misconceptions/misunderstandings and in identifying barriers to behavior change. This is because KAP not only revealed what was 'known' or 'said' by the participants/communities but also what is 'done' or in other words, 'practiced'. Photovoice was the methodology of choice for this study as it was a means for

enhancing participant engagement and empowering them by use of technology. While the second and third focus group discussions were facilitated using the photographs, the pictures were mainly used study the practice component of the KAP study. It was also a means to motivate mothers to share their ‘own stories’ by revealing their day-to-day household activities using the photographs and presenting their perspectives as part of the group discussions that followed. The photovoice methodology not only was an exposition of the mother’s daily life but also engaged the household members thereby becoming a very strong collaborative effort of communities that participated in the study.

BIBLIOGRAPHY

Chilton, M., Rabinowich, J., Council, C., & Breaux, J. (2009). Witnesses to hunger: Participation though photovoice to ensure the right to food.

Contento, Balch, Bronner, Lytle, Maloney, Olson, & Swadener. (2015). The effectiveness of nutrition education and implications for nutrition education policy, programs, and research: a review of research.

FAO. (2014). Guidelines for assessing nutrition-related Knowledge, Attitudes and Practices.

FHI. (2002). BEHAVIOR CHANGE COMMUNICATION (BCC) FOR HIV/AIDS: A STRATEGIC FRAMEWORK

FNSUSDA. (2010). Helping Americans Make Healthy Choices

GlobalPolioEradicationInitiative. (2010). KAP studies - understanding barriers to immunization.

GRAGNOLATI, M., BREDENKAMP, C., GUPTA, M. D., LEE, Y.-K., & SHEKAR, M. (2006). ICDS and Persistent Undernutrition Strategies to Enhance the Impact.

Graham, I. D., Logan, J., Harrison, M. B., Straus, S. E., Tetroe, J., Caswell, W., & Robinson, N. (2006). Lost in Knowledge Translation: Time for a Map? .

Gupta, M. C., Mehrotra, M., Arora, S., & Saran, M. (1991). Relation of childhood malnutrition to parental education and mothers' nutrition related KAP. *Indian J Pediatr, 58(2), 269-274*.

Gupta, M. C., Mehrotra, M., Arora, S., & Saran, M. (1991). Relation of childhood malnutrition to parental education and mothers' nutrition related KAP.

Johnson, L. S. (2005). From knowledge transfer to knowledge translation: Applying research to practice.

Katigbak, C., Devanter, N. V., Islam, N., & Trinh-Shevrin, C. (2015). Partners in Health: A Conceptual Framework for the Role of Community Health Workers in Facilitating Patients' Adoption of Healthy Behaviors.

Kaufman, M. R., Cornish, F., Zimmerman, R. S., & Johnson, B. T. (2014). Health Behavior Change Models for HIV Prevention and AIDS Care: Practical Recommendations for a Multi-Level Approach.

Kumar, D., Goel, N. K., Mittal, P. C., & Misra, P. (2006). Influence of Infant-feeding Practices on Nutritional Status of Under-five Children

Kumari, S., Kayal, R., Varma, A., & Bhateja, U. (1982). Nutrition education: its impact on malnutrition. *J Trop Pediatr, 28*(4), 216-217.

Mbuya, M. N. N., Menon, P., Habicht, J.-P., Pelto, G. H., & Ruel, M. T. (2013). Maternal Knowledge after Nutrition Behavior Change Communication Is Conditional on Both Health Workers Knowledge and Knowledge-Sharing Efficacy in Rural Haiti.

Nandan, D., & Yunus, S. (2009). INFANT AND YOUNG CHILD FEEDING (IYCF) PRACTICES NEED A FILLIP.

Nankumbi, J., & Muliira, J. K. (2015). Barriers to Infant and Child-feeding Practices: A Qualitative Study of Primary Caregivers in Rural Uganda.

NCDDR. (2005). What is Knowledge Translation?

NFHS. (2000). Women's Education Can Improve Child Nutrition in India.

Nguyen, P. H., Menon, P., Ruel, M., & Hajeebhoy, N. (2011). A situational review of infant and young child feeding practices and interventions in Viet Nam

Ogunjuyigbe, P. O., & Ojofetim, E. O. (2006). CULTURE AND FEEDING PRACTICES: MAJOR UNDERLYING CAUSES OF CHILDHOOD MALNUTRITION IN DEVELOPING COUNTRIES

Paul, T., & Khandelwal, S. (2014). Tackling malnutrition in India: the role of higher education from http://www.theguardian.com/global-development-professionals-network/2014/jan/20/india-malnutrition-research-development

Psaki, S. (2012). Household food access and child malnutrition: results from the eight-country MAL-ED study.

R.Harnagle, & Chawla, P. S. (2013). A study of knowledge, attitude and practices (kap) of lactating mothers on breast feeding,weaning immunization and dietary practices at Jabalpur cantonment, India.

Roy, S. K., Jolly, S. P., Shafique, S., Fuchs, G., Mahmud, Z., & Chumki, B. Prevention of Malnutrition among Young Children in Rural Bangladesh by a Food-Health-Care Educational Intervention: A Randomized, Controlled Trial.

Smith L.C., Haddad L. (2001) How important is improving food availability for reducing child malnutrition in developing countries?

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE (IFPRI). (2003) The Importance of Women's Status for Child Nutrition in Developing Countries.

Saito, K., Korzenik, J. R., Jekel, J. F., & Bhattacharji, S. (1997). A case-control study of maternal knowledge of malnutrition and health-care-seeking attitudes in rural South India.

SPRING. (2014). Evidence of Effective Approaches to Social and Behavior Change Communication for Preventing and Reducing Stunting and Anemia Findings from a Systematic Literature Review

UNDAF. (2010). ROLE OF MEDICAL PERSONNEL IN PROMOTING APPROPRIATE INFANT AND YOUNG CHILD FEEDING.

UNICEF. (2006). Preventing and controlling micronutrient deficiencies
in populations affected by an emergency.

UNICEF. (2007). Combating malnutrition on an emergency footing in Bihar - See more at: http://unicef.in/Story/275/Combating-malnutrition-on-an-emergency-footing-in-Bihar#sthash.5StGqyul.dpuf.

UNICEF. (2008). Bihar launches ICDS-IV

UNICEF. (2015). Micronutrients from http://www.unicef.org/nutrition/index_iodine.html

WANG, C. C., YI, W. K., TAO, Z. W., & CAROVANO, K. (1998). Photovoice as a participatory health promotion strategy. *HEALTH PROMOTION INTERNATIONAL Vol. 13, No. 1*

WHO. (2001). Organization WH. Iron deficiency anaemia assessment, prevention and control: a guide for programme managers.

WHO. (2003). Complementary feeding: report of the global consultation Summary of guiding principles.

WHO. (2011). Guideline:Use of multiple micronutrient powders for home fortification of foods consumed by infants and children 6–23 months of age.

WHO. (2011). Multiple micronutrient powders for home (point of use) fortifi cation of foods in pregnant women: a systematic review.

WoltersKluwer. (2015). Micronutrient deficiencies associated with malnutrition in children.

WorldBank. (2011). Nutritionat a GLANCE. from http://siteresources.worldbank.org/NUTRITION/Resources/281846-1271963823772/India.pdf

WorldBank. (2016). Child Malnutrition