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# Path to severe acute malnutrition in children below 2 years of age: Findings of qualitative research in Uttar Pradesh, North India

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ABSTRACT

*Introduction:* Malnutrition in infancy contributes to high mortality and morbidity. In India, government has established nutrition rehabilitation centres for managing children with severe acute malnutrition. The study was conducted with aim to understand how community perceived malnutrition and how child's size at birth, infant and young child feeding related behaviours and child's illness were associated with decline in the child's growth or health.

*Methods:* Qualitative research employing focused ethnographic methodologies was used. From February–December 2016, cases studies and in-depth interviews were conducted with 12 mothers of malnourished children < 24 months of age (cases), purposively recruited from nutrition rehabilitation centre of 3 districts in Uttar Pradesh, North India. Twenty-four mothers of gender and age matched well-nourished controls from village of cases were also interviewed. Focus group discussion was done with community health workers from villages of cases. Data were coded and after analysis and data triangulation, emerging concepts were grouped into core themes linked with malnutrition.

*Results:* Grounded on experience of participants, emerging themes were that importance of exclusive breastfeeding was neither understood nor emphasized, there was no concept of complementary feeding, family food lacked diversity, malnutrition was not recognised as a health hazard, and there was lack of autonomy of females in reproductive and general health issues.

*Conclusion:* Given these paths to malnutrition in infancy, there is an urgent need to create community awareness about malnutrition as a disease as well as about optimal breastfeeding and complementary feeding practices in infancy by using innovative behaviour change communication strategies.

## 1. Introduction

Malnutrition is a major public health problem in low and middle-income countries. Worldwide, there are about165 million stunted, 52 million wasted, and 17 million severely wasted under-five children.[1] Of these, more than half of stunted and more than two-thirds of wasted children live in Asia.[2] There has been a decline in malnutrition in India in the last decade, but the figures are still alarming. Recent data show that 38.4% Indian children are stunted, 21.0% are wasted, and 7.5% are severely wasted.[3]

Malnutrition contributes to high morbidity and mortality worldwide. Globally, malnutrition is the underlying cause of death of about 3 million (or 45%) under-five children every year.[1] Of these, 11.6% (804,000) children die due to suboptimum breastfeeding.[1] Strong scientific evidence suggests that insufficient quantities and inadequate quality of complementary foods (CFs), poor child-feeding practices and heavy burden of infectious illnesses have adverse impact on child survival, growth and development. Poverty, food insecurity, ignorance, poor hygiene and sanitation are some other factors responsible for high levels of child malnutrition in developing countries, including India.[4]

In this study, we have adapted the conceptual framework for pathways to malnutrition proposed by the United Nations Children's Fund (UNICEF) in 2013 and used it.[5] This framework provides a comprehensive understanding of multiple causes of malnutrition that operate at the `immediate', `underlying' and `basic' level. We did not assess the `potential resources' that can contribute to malnutrition in this study (Fig. 1). We have adapted the UNICEF framework by adding the cultural dimension here. Cultural and traditional feeding practices

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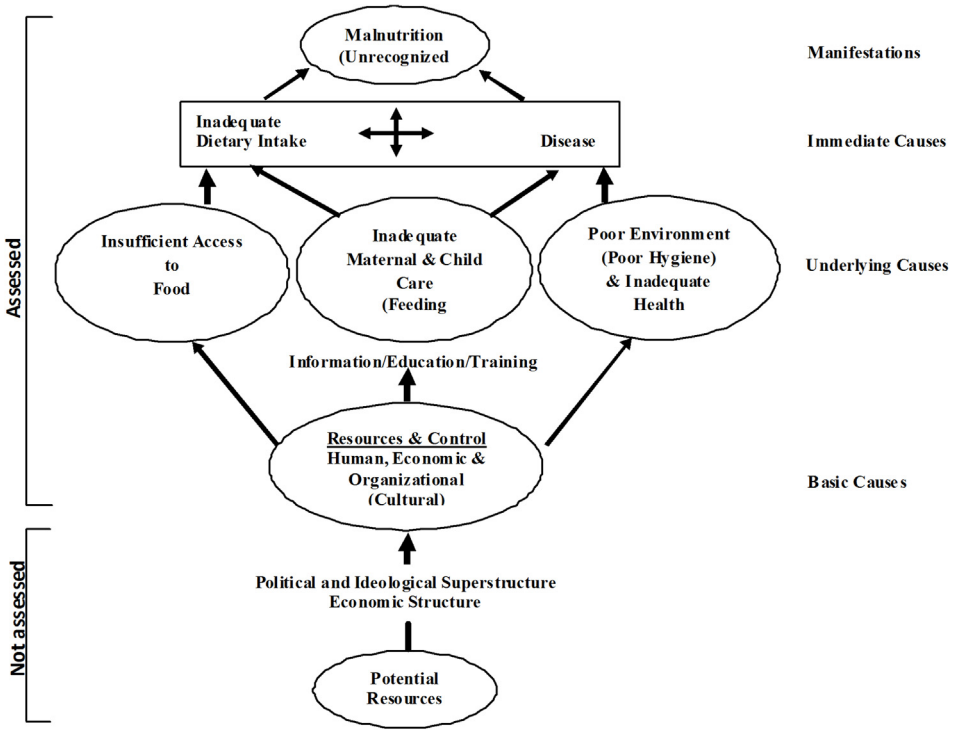


**Fig. 1.** Conceptual framework of child malnutrition.

influence type, quantity and frequency of food given to women and children. All factors outlined in UNICEF framework, together contribute to a viscous cycle of inadequate dietary intake and frequent diseases resulting in malnutrition in young infants. Malnutrition is often not identified by the caregivers as they seldom seek health care for it.

The aim of this qualitative research was to understand how community perceived malnutrition and how child's size at birth, infant and young child feeding (IYCF) related behaviours, and child's illness were associated with decline in the child's growth or health.

## 2. Materials and methods

### 2.1. Study setting

This study was conducted in Uttar Pradesh, the most populous state in northern part of India. Uttar Pradesh is divided into 71 administrative districts, and the current study was done in three districts-Barabanki, Sitapur and Hardoi (Fig. 2). These districts were purposively selected as they have been identified by the government for implementation of focused health care interventions.[6] These districts also have a functional Nutritional Rehabilitation Centre (NRC), established by the Government, where children with severe acute malnutrition (SAM) are provided medical and nutritional therapeutic care.[7] Malnourished (MN) children live with their mother/caregiver at NRC until they attain target weight-gain of 15% from the admission weight.[8] In project districts, like the rest of state, Accredited Social Health Activist (ASHA) and Aaganwadi worker (AWW) are present at village level to provide health, nutrition, education and related services to young children.

### 2.2. Study design

FHI 360's Protection of Human Subjects Committee reviewed the project protocol and exempted it under 45 CFR 46.101. Approval was also obtained from Institutional Ethics Committee, King George's Medical University, Lucknow, India. Written informed consent was obtained from the mothers.

This study used a qualitative, case-control design. Theoretical approach of parental ethnographies[9] was used to collect local perspectives of mothers and community health providers (CHWs) to establish individual links to paths to malnutrition. Focused Ethnographic Methodology[10] of In-depth interviews (IDI), focus group discussions (FGDs) and case studies were used. IDIs were conducted to capture information on feeding behaviours and practices of children ≤24 months and their morbidity patterns from mothers of MN and well-nourished (WN) children. Case studies of MN children admitted in NRCs were also compiled. FGDs with ASHAs & AWWs were conducted to collect contextual information on burden and aetiologies of child malnutrition, insights on feeding behaviors, practices and health care seeking behaviour of community, thus validating findings of IDI and case studies.

Data collection instruments were developed in English and then translated in local language (Hindi). Instruments were pre-tested, revised and back-translated to English. Photographs of MN and WN neonates were used in IDI to obtain local perceptions on child's size and growth (Fig. 3). Frequency and quantity of food fed to a child was asked by showing a standardized bowl of 250 ml to the respondents. For case studies, respondents were asked to give a narrative description about the onset and progression of child's malnutrition, describe health seeking pattern and socio-economic implications of child's ill health on the family.

### 2.3. Data collection

#### 2.3.1. In-depth interview

One functional NRC was selected from each project district. From each NRC, included were 4 children < 24 months of age with SAM, as defined by World Health Organization (WHO).[8] One child per village or town was selected, using purposive sampling. Children with clinically known reasons for failure to thrive (congenital heart disease, chronic kidney or liver diseases, cleft lip and palate, immunodeficiency etc) were excluded. Controls were identified from the village of cases. For each case, gender matched and age matched ( ± 3 months) two WN children per village who were < 24 months of age, healthy on the day of interview, had weight-for-age + 1 z-score (WHO criteria)[8] were

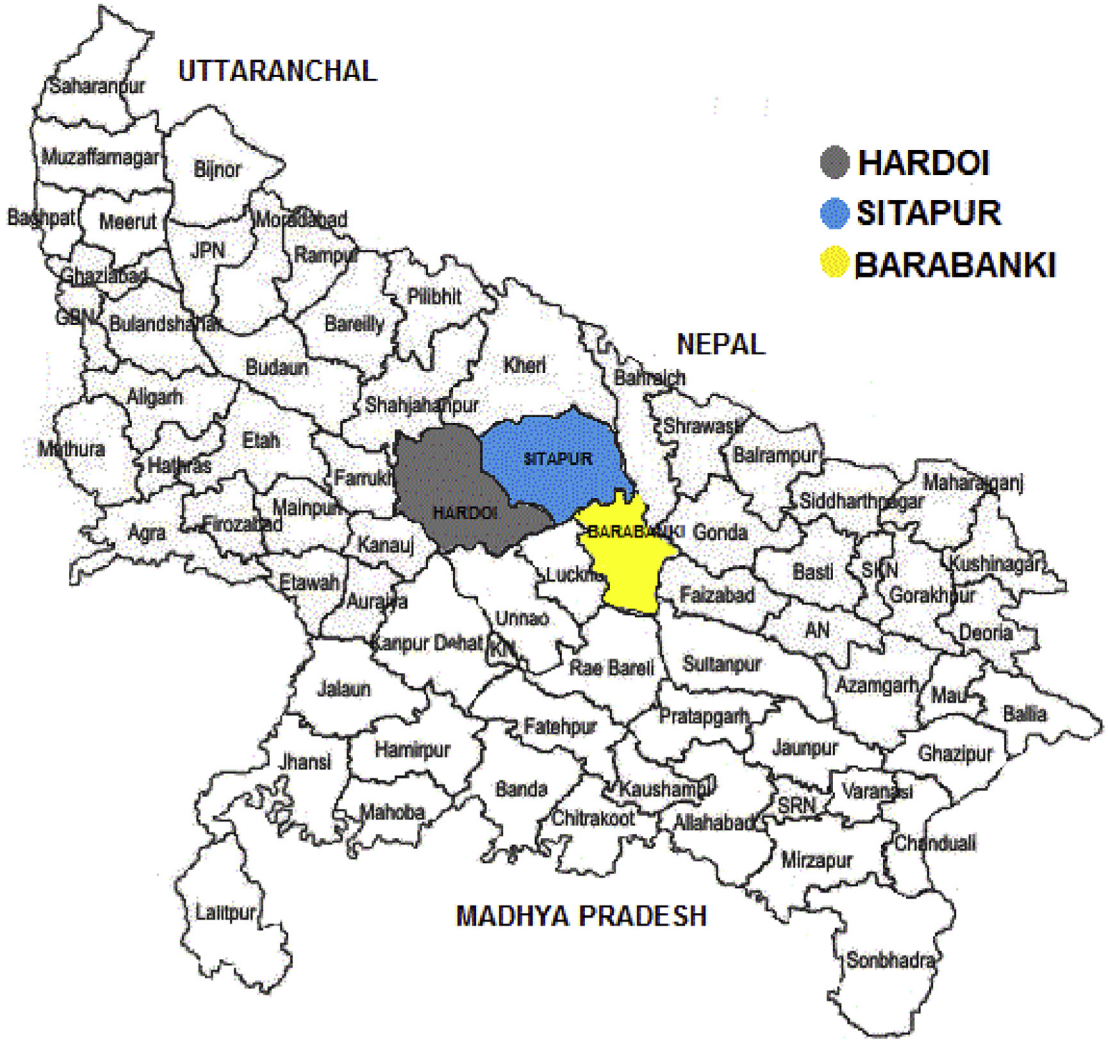


**Fig. 2.** Study districts in Uttar Pradesh, North India.

identified from records maintained by the AWW. No formal sample size calculation was done for this qualitative study.

Twelve mothers of MN children were approached at the NRC to participate in IDI as well as in case study. Twenty-four mothers of WN children participated only in IDI. Age specific feeding information was collected on type, frequency and quantity of feeding and difficulty faced during feeding. Feeding behaviours like sharing meal time, availability & use of separate utensils for children, hygiene practices during food preparation and feeding were explored. While collecting data, respondents were probed for deeper meaning and understanding of

**Picture of malnourished newborn (left) and well norised newborn (right) used in Indepth interview**

**Fig. 3.** Picture of malnourished and well-nourished neonate used in In-depth Interviews.

responses. IDIs were recorded with prior permission of the respondents.

#### 2.3.2. Case studies

Mothers of MN children were asked to describe retrospectively how their child became malnourished and the health seeking behaviour adopted by them during various morbidity episodes.

#### 2.3.3. Focus group discussion

Three FGDs with ASHA workers and three with AWWs were conducted at the office where they routinely reported. FGD participants were purposively selected having job experience > 2 years and having an experience in identifying/managing a case of malnutrition. A facilitator moderated the discussion while a note taker took hand written notes.

#### 2.3.4. Data management and analysis

The interviewer transcribed transcripts in local language ensuring that they captured not only the spoken part of interview but also setting, context, body language and general feel of the discussion.[11] Both handwritten notes and audio records were used for transcription. Transcripts were translated into English. Thirty percent of transcripts and their translations were reviewed by project investigators.

Codebook was developed to manage evolving coding schemes, their content descriptions, and examples from the data that can be used as reference 12. Manual coding was done to identify patterns and categorize codes into categories and subcategories. For code allocation, each transcript was read and re-read by social scientist. Any discrepancies that occurred during coding were resolved by re-listening to the voice recordings and referring to the field notes. Frequencies of emerging codes and their categories were counted. For the purpose of data interpretation, frequencies of the responses obtained against each code are being reported using a standard term (Table 1). Paths to malnutrition were identified based on emerging concepts. Frequencies, co-occurrences, and coding-memos were used to describe data after the coding has been completed.

## 3. Results

### 3.1. Characteristics of the respondents

The study was conducted from February to December 2016. All mothers resided in rural areas. Baseline characteristics of mothers and recruited children are given in Table 2. FGD respondents were females with mean age of 38.05 ( ± 6.12) years. More than half (41/72, 56.9%) of respondents had job experience of > 8 years.

We derived five themes that were grounded in direct experience of the participants.

### 3.2. Theme 1: pre-lacteal feeding was a barrier to exclusive breastfeeding

Mothers of both groups, MN and WN, gave prelacteal feeds. Mothers of WN children believed that prelacteal feeds "*provided strength/immunity*", "*facilitated easy digestion*" or "*kept the child`s stomach full*". Mothers of MN also informed that giving these feeds was a norm. Prelacteal feeds commonly fed were: honey, `*ghutti*`(tonic made from herbs, additives and honey), water, sugar-water, jaggery (cane sugar) water or animal milk. These were given frequently, sometimes every hour. Neighbours, family members and relatives advised the mother to give prelacteal feeds.

Even though prelacteal feeds were given, most mothers of MN and some of WN children, initiated breastfeeding within an hour after birth. Partial breastfeeding was practiced by both groups of mothers since birth. Use of animal milk diluted with water was common. Most mothers had limited understanding of the advantages of breastfeeding. Only few mothers of WN children could explain that breast milk provided immunity and strength to neonate. Their opinion was largely based on information provided by CHWs during their routine home visits or at the time of immunization. Mothers of MN and WN children could not explain why breastfeeding should be exclusive and what could be the possible implications of non-exclusive breastfeeding. Few mothers of MN children admitted not breastfeeding but giving only animal milk or formula milk to the neonate. Reasons for artificial feeding were: insufficient or less milk produced by the mother, illness of the mother, pain caused by "*sore breasts*", child unable to breastfeed as ill/"*very weak*" since birth.

**Table 1**
Standard Terms used for Qualitative Data Interpretation.

| Response range | Standard Term |
|---|---|
| 0% | None |
| 1–33% | Few |
| 34–66% | Some |
| 67–99% | Most |
| 100% | All |

**Table 2**
Maternal and children baseline characteristics.

| Baseline characteristics | Malnourished (n = 12) | Well nourished (n = 24) |
|---|---|---|
| **Maternal Characteristics** | | |
| **Age**(years) (Mean ± SD) | 27.083 (6.11) | 25.54 (4.42) |
| **Age at marriage** (years)Mean ( ± SD) | 18.16 (1.58) | 19.25(2.17) |
| **Gravida** (Mean ± SD) | 3.14 (2.31) | 2.42(1.74) |
| **Education** (n, %) | | |
| No-formal Education | 7(58.33) | 11 (45.83) |
| Formal Education | 5 (41.66) | 13 (54.16) |
| **Occupation** (n, %) | | |
| Homemaker | 11 (91.67) | 24 (100) |
| Agricultural labourer | 1(8.33) | 0(0.00) |
| **BMI** (n, %) | | |
| Underweight (< 18.5) | 9(75.00) | 7(33.3) |
| Normal (18.50–24.99) | 3(25.00) | 13(61.9) |
| Overweight& obese (≥25.00) | 0(0.00) | 1(4.8) |
| **Paternal Characteristics** | | |
| **Age** (years) (Mean ± SD) | 34.42 (8.81) | 29.86 (5.52) |
| **Education** (n, %) | | |
| No-formal Education | 2 (16.67) | 3(12.50) |
| Formal Education | 10 (83.33) | 21(87.5) |
| **Occupation** (n, %) | | |
| Agriculture | 9(75.00) | 12 (50.00) |
| Self Employed | 0(0.00) | 4(16.66) |
| Domestic help | 1(8.33) | 3(12.5) |
| Unemployed | 2(16.66) | 5(20.8) |
| **Family & Housing** | | |
| **Family size** (Mean ± SD) | 6.16 ( ± 1.89) | 6.95 ( ± 3.05) |
| **Type of house** | | |
| Constructed | 4 (33.33) | 5(20.83) |
| Semi-constructed | 8(66.66) | 19(79.16) |
| No toilet | 8(66.66) | 22 (91.66) |
| **Children Characteristics** | | |
| **Age of Child ≤ 6 months** (number, %) | 2 (16.6) | 2(8.3) |
| **Age of Child 7–11 months** (number, %) | 1 (8.3) | 5(20.8) |
| **Age of Child 12–23 months** (number, %) | 9 (75) | 17(70.8) |
| **Male** (number, %) | 6 (50) | 13 (54.2) |
| **Birth weight** (kg.) (Mean ± SD) | 2.25 ( ± 0.69) | 2.91( ± 0.54) |
| **Birth order** (Mean ± SD) | 2.92 (+1.56) | 1.96 (+1.33) |
| **Sibling** (Mean ± SD) | 2.75 ( ± 1.42) | 2.41 ( ± 1.50) |
| **Birth Spacing** (months) (Mean ± SD) | 24.00(18.29) | 16.70(21.36) |
| **Place of Birth –Institutional** (n, %) | 8 (66.66) | 22 (91.66) |

**Table 3**
Representative quotations.

**Theme 1: Pre-lacteal feeding was a barrier to exclusive breastfeeding**
- "`Ghutti' is beneficial for the child. It is good for the stomach as the child does not have loose motions. Milk is easily digested and thus the child sleeps peacefully. Child does not spit out milk" (Mother of malnourished child, Sitapur)
- "Honey and goat's milk should be given to a young child as they are good. Since years, we have practiced giving these to our children. Water should be mixed with goat's milk as pure milk is heavy for a young child to digest." (Mother of malnourished child, Sitapur)
- "My breastmilk came out very less. Still, somehow, I squeezed some milk out with my hands and fed the child. My mother-in-law also helped me in this. My daughter could only be fed using spoon-bowl and by opening her mouth by our hands. One day, my mother-in law decided to take my daughter to a doctor. I don't know if the doctor admitted my child or not as I was also not feeling well at that time and was at home. My daughter was fed milk available in box (formula milk) after that" (Mother of malnourished child, Hardoi)

**Theme 2: Inadequate Complementary Feeding Practices**
- "If other siblings are eating, then the young child will also learn to eat on seeing them. This (malnourished) child is not given anything special to eat. Nor does he eat separately. My role is only to give him milk when he demands" (Mother of well-nourished child, Sitapur)
- "In families of an malnourished child, the younger child is not fed separately. Two siblings eat from the same plate. The older one eats fast and very little is left for the younger child. It may cause the younger one to be less-nourished. Another reason for malnourishment is that people do not get their children immunized. Only caregivers that are careless and untidy have malnourished children"(ASHA, FGD-Barabanki)

**Theme 3: Lack of Family Food Diversity**
- "We do not get anything in the village. What can we give the child? Banana, apples are good for the child. They give strength and something good will reach child's stomach. The child's stomach will be full and he will be healthy." (Mother of malnourished child, Hardoi)
- "Pumpkin, gourd and green leafy vegetables are important but what to do? When we advice people to eat these vegetables they ask us as to why we tell telling them to eat these. People think that since they are poor therefore, we are telling them to eat spinach, pumpkin (as they are cheap). They do not understand the nutrient importance of these"(ASHA in FGD-Sitapur)
- "Why will these foods (commercially available snacks) be harmful? My child does not vomit these. I give my children X (name of biscuit brand) biscuits. It has vitamins" (Mother of malnourished child, Sitapur)
- "Matar (salty seeds in commercial pack), biscuits and chips are harmful food for children. But what to do? Children like them very much. Biscuits are made up of refined flour. When a child eats biscuits regularly, it may cause stomach swelling" (Mother of malnourished child, Sitapur)

**Theme 4: Malnutrition not recognised as health hazard**
- "If the child is not ill, but only malnourished, then he is not taken anywhere for treatment. Community says that my child is eating well, he is ok, why go to the doctor? According to them, malnutrition is not a serious condition" (AWW, Sitapur)
- "This child is having very less weight. His face is pale. Skin on face is loose. Bones can be seen. It must not have been fed properly." (Mother of MN child, Hardoi on photograph of malnourished neonate)
- "Some mothers stop breastfeeding the previous child as soon as their conceive. They do so, as they believe, the child in womb will have weaker legs if they continue breastfeeding this child" (AWW-Barabanki)
- "My child did not feed therefore ANM advised us to take the child to the government doctor at block level hospital. However, we decided not to go as it required time. You can say nothing special was done by us" (Mother of malnourished child, Hardoi)

Partial breastfeeding which started since birth continued until 6 months of age. None of the MN and only one WN child was exclusively breastfed for 6 months. Three-fourths of MN children and most WN children were also fed animal milk/water in addition to breast milk. The decision to feed animal milk was based on mother's prior child rearing experience or on advice of family members/elders. Perceived benefits of animal milk were: "*good for child`s health*", "*gave strength*", "*digests easily*" or "*kept the child protected from frequently falling ill*".

One-fourth MN children and few WN children were fed formula milk as they had difficulty in breastfeeding. Few mothers of MN child consulted a doctor to "*get medicines to produce milk*" but medicines "*did not work*". After this, the child was advised formula milk by the doctor. Formula milk diluted with water was fed to make it "*easy to digest*" for young infants. Quotes are given in Table 3.

Advice of family, peers and neighbours played a major role in influencing mother's decision to feed young infants. Mother's own behavioural experiences based on previous child rearing experiences or personal preferences also influenced what and how she fed the child. Mothers were receptive to advice from medical professionals, but the opportunities to meet them were limited. Few mothers reported receiving advice from the CHWs, but the information lacked specificity and was biased by personal opinion.

### 3.3. Theme 2: inadequate complementary feeding (CF) practices

During IDIs, mothers provided information on the amount of meal fed to a child aged 6–11 months and his/her meal frequency. Most MN children were being fed less quantity of CFs compared to WN children. Some mothers of MN children gave less than one-quarter of standard bowl. Few gave only few spoons of CFs as the "*child was lethargic most of the time*" or seemed disinterested. On the contrary, most mothers of WN children gave at least one-quarter of standard bowl. Therefore, WN children were being fed more quantity of CFs than MN children. Frequency of giving meals was minimum two times a day for both MN and WN groups indicating that frequency matched the international recommendations.[13]

Mother's opinion was obtained on meal quantity and meal frequency for children aged 12–23 months. As seen for younger children, most MN children were being fed less compared to WN children. Some MN children were fed approximately half bowl of food/meal while few consumed 1–2 full bowls of food. On the other hand, mothers of MN children said that their child ate ≤ one-quarter bowl. The amount fed to both groups did not match international recommendations.[13] With respect to meal frequency for this age-group, mothers of MN children opined that the child should be fed two times/day while those of WN children opined that child be fed at least three times/day.

Meals given to children were general vegetarian family foods like vegetables, fruits, cereals, pulses, and rice. Food prepared for the family was also offered to children. No special recipe was prepared for them. Children ate from the plate of one of the family members. Most mothers encouraged the child to feed with other siblings/family members. Most families eat meals together. A child was fed separately only when the mother perceived child too young to feed on his/her own or when the "*child ate very less*" and therefore required supervised feeding (Table 3). Moreover, children only on dry solids (like bread, biscuit, chapatti) also did not require separate utensils as they just held it in their hands.

### 3.4. Theme 3: lack of family food diversity

Foods frequently used for CF of children were either commercially available, such as snacks (biscuits, spongy cake and salty items), bread or homemade recipes (porridge, rice-starch or pulse-water). Infrequently fruit juices, fruits, vegetables, rice, pulses and cereals were also used. By the age of 6–11 months, most MN and WN infants were fed with one or two varieties of CFs. When compared to WN children, there was less diversity in CFs given to MN child, and foods given included only biscuits, bread dipped in milk/tea, rice-starch or pulse-water. Only few MN infants had CFs containing fruits and preparations from cereals (wheat and rice), pulses, and vegetables in the form on potatoes only. In contrast, WN children had food diversity with fruits, cereals, pulses, *khichdi`* (pulse and rice cooked together with oil till semi-solid), used clarified butter to garnish "*roti*" (homemade wheat bread), and mostly potatoes as vegetable. There was no use of commercially available infant cereal in both groups. Most mothers had never heard of it. Those few who knew about it opined that it was expensive and unavailable in local market. Some mothers of MN and WN children fed them with occasionally with eggs or other non-vegetarian food.

Until 6–11 months of age, CF of three-quarter MN infants comprised mostly of liquids (pulse water/rice starch) along with some solid (often biscuits). In contrast, CF of most WN infants comprised liquid, semi-

solid and solid items. About one-third MN and only about one-tenth WN infants did not consume any semi-solid/solid food till about a year. These infants were only on liquids diets, such as animal/breast milk, rice starch, or pulse water. Few mothers of MN child faced difficulty in feeding but took no action to resolve this as the child was perceived "*not ill*".

When the child reached the age of 12–23 months, CF feeding was done by commercially available or homemade snacks comprising cereals like wheat, rice or rice water, pulses or pulse water, `*khichdi*, fruits, or vegetables. The medium of coking was vegetable or mustard oil. Wheat was introduced as part of staple diet after the child was more than a year old. Diet of WN and MN infants now comprised primarily of semi-solids/solids with less emphasis on liquids. Mothers opined that cereals and fruits were necessary for an infant "*to make the child healthy/ help gain strength*"; "*make him/her learn to walk easily*", or to "*keep child`s stomach full*". Mothers preferred to give fruits rather than vegetables to young children. The reason, as stated by them, was that spicy vegetables, routinely prepared for the family, did not appeal to children and they disliked its taste. Fruits, in addition to being sweet, had superior health benefits, but affordability, availability, and accessibility of fruits was limited. Eggs, non-vegetarian food, and nuts were fed only occasionally as they were considered expensive and were consumed for taste and not for their nutrient value. Commercially available infant cereal was not given to any child at age 12–23 months. CHWs informed that people were unaware of marketed infant cereals and only "*educated*", "*affluent*" families used it on advice of doctors (Table 3).

Commercially available snacks, especially sweet biscuits, were popular CFs for children of all age groups. Most mothers of MN and some of WN children gave biscuits regularly. CHWs confirmed that young infants were regularly fed `sugary snack food' (biscuits, cookies, cake) and/or `savoury snack foods' (chips, crisps, biscuits, crackers)[19] irrespective of income levels. Caregiver's motivations for buying these items were: easy availability, instant appetite satiety, and easy to feed. Few mothers of WN children had worrisome concerns for these snacks but gave in to their children's liking (Table 3).

Some mothers of MN children faced difficulty in feeding the child at age 12–23 months as children "*vomited*" food. Mothers adopted either forceful feeding or fed mostly liquids to the child. Some mothers approached a village-based doctor or ANM for treatment/advice but the difficulty persisted.

### 3.5. Theme 4: malnutrition not recognised as health hazard

MN child was easily recognised by the mothers. Most mothers of MN children informed that their child was *"born smaller*" compared to other children in the community. Weight of the child was an important parameter to assess child's growth. Mothers opined that a "*thin*" child of "*less weight*" was more vulnerable to illnesses. When photographs of MN and WN neonate were shown to mothers, they were able to correctly differentiate between the two [Fig. 3]. A child was labelled MN when his/her "*face was pale*", "*ribs were visible*", had "*wrinkles on skin*" or had "a *sunken stomach*". Most mothers opined that the MN child failed to thrive due to frequent illness, incomplete immunization or the "*child must not have been breastfed*", or "*must have been poorly cared*". Poor antenatal and postnatal care received by the mother at home were also believed to responsible for birth of MN child. CHWs informed that poverty, less birth spacing, early termination of breastfeeding, less quantity of CFs fed to child, poor hygiene practices, poor education of the mother, delayed and unqualified health care seeking, and irregular immunization were factors contributing to high burden of malnutrition.

Malnutrition was a cause of concern for most mothers, but it was not considered an illness. Caregivers had no information that malnutrition, if left unaddressed, may cause death, disease, and impaired growth of their child. Therefore, families did not seek health care for it (Table 3). Mothers of MN child shared during case studies that health care was sought only when the child suffered from co-morbidities of malnutrition like diarrhoea, "*fever*", measles or when the child suffered from "*serious*" signs like stop feeding, convulsions, cyanosis, vomiting etc. In all cases either a traditional healer or an unqualified health care provider was the first health care provider who was approached. Qualified health care was sought only when illness persisted or was recurrent. Most MN children had been admitted in NRC through outpatient department of public health facility or referral by CHW after unqualified health care seeking. Referral to NRC was not easily accepted by the caregivers for reasons like: transportation costs, opportunity costs (mother had to stay with child for 14 days), apprehensions about behaviour of NRC staff, stay of caregiver with the child and perceived "*non serious*" nature of illness by the caregiver that "*did not require hospital admission*".

### 3.6. Theme 5: lack of autonomy in female reproductive and general health issues

CHWs opined that many children in their community are malnourished. Mothers' lacked autonomy in female reproductive issues. CHWs informed that short birth spacing caused early termination of breastfeeding. Also, mother took less care of the young child due to her own health related compilations during pregnancy and "*weakness*" caused by frequent deliveries. All these caused the child to become malnourished.

Mothers also had limited role in choice of food purchased for the family. They did not visit the market to buy food. Husband or father-in-law went to the local market once a week or fortnight to buy essential food commodities. Their purchase was governed by food prices and availability of food in nearby market.

## 4. Discussion

This qualitative study was conducted with an objective to understand how community perceived malnutrition and how child's size at birth, infant and young child feeding (IYCF) related behaviours and child's illness were associated with decline in the child's growth or health. We adapted UNICEF conceptual framework (Fig. 1) for identifying the site-specific determinants so that we could provide short term solutions.[5]

We found that in young children, malnutrition in isolation was not recognised as a disease. MN child was taken for health care only when s/he became sick. Our findings are in consonance with that reported by another Indian study.[14] Self-treatment was preferred for a MN child, and only after it was ineffective, caregivers would then consult a health care provider.[14] In our study, `immediate' causes contributing to malnutrition were - inadequate breastfeeding, inadequate CF, and repeated episodes of illness. Poor maternal knowledge on infant feeding compounded by poverty, mother's limited access to food, her limited autonomy to purchase food, and suboptimal hygienic practices were other factors that caused malnutrition.

Recent National Family Health Survey reports that in Uttar Pradesh, 41.6% children under age 6 months are exclusively breastfed.[15] Our study found that exclusive breastfeeding was not practiced by any mother of MN, however, and only one mother of WN child. This low rate of exclusive breastfeeding may have resulted from the small sample size selected for the study. Factors like maternal knowledge and attitude, burden of work, receipt of breastfeeding education, and literacy levels significantly impact maternal decision to exclusively breastfeed.[16–20] The cultural practice of giving prelacteal is widely prevalent in India[21] and its neighbouring countries.[22,23] Our study, in consonance with previous studies, also found that use of prelacteal feed was widely prevalent.

Our study found that families had no concept of CF. Mothers of MN children delayed initiation of CFs. Moreover, MN children were fed less amount, type, and diversity of food. Less amount and frequency of diet of MN child was probably due to poor appetite of the child caused by

repeated infections. Therefore, the mother gave small portions of food which further aggravated malnutrition. CHWs did not encourage the mother for timely, adequate, and appropriate CF. Diet of the child was high in energy-dense foods but lacked animal protein and iron. Commercially available snacks, high in sugar/carbohydrates and fat and low in micronutrients, were widely available and frequently consumed. These may have further aggravated malnutrition.

CF promotion initiatives are largely lacking. In the community, CHWs are supposed to provide counselling to mothers for CF and also to identify high risk cases,[24] but this is being seldom followed.[25] We therefore propose that the way forward is to invest in creating community awareness about nutrition and to draw peer counsellors from within the community.[26] Also, male members of the community should be involved to support the mothers. Special nutrition-enriched recipes could also be promoted. In our study we found that family money was used to purchase only two-to-three types of staple food for the entire family and food diversity was largely lacking. Purchase of special food for infants was almost never done in this community. Even if the mother was educated, still there was lack of diversity in food as she had limited autonomy in purchase of food items. Mother also had less autonomy over family planning and birth spacing, leading to frequent pregnancies causing under nutrition in mother, new born and infant.

Several strengths of the study are worth noting. We recruited MN cases from state-run NRC and went to the village of case to recruit WN child. This was done to ensure that the basic (cultural) and underlying causes of malnutrition were as similar as possible. Qualitative tools were used to obtain information from the mothers and community health workers. Use of methodological triangulation in our study reduced systematic bias and enhanced internal validity.[27] Site-specific adaptation and realistic evaluation of the framework was done. We attempted to identify local solutions to address the issue of malnutrition. Data collected was cross-sectional.

The study had a few limitations. Our study sample size was small with 12 MN and 24 WN children being recruited. Only three of the five NRCs were sampled, although the NRCs were located in different districts. Therefore, they could represent the entire state. In India, the data could be representative of sites with similar socio-demographic settings.

## 5. Conclusion

Given the paths to malnourishment in infancy identifies, we need to create community awareness firstly about malnutrition as a disease and secondly about optimal breastfeeding/complementary feeding practices in infancy. Community involvement as peer-to-peer counsellors/motivators has to be optimized within the current setup as it has provided rich dividends in other countries. Solutions are urgently needed to reduce the burden of malnutrition and its associated mortality in infancy.

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