REVIEW OF LITERATURE

Chapter II

REVIEW OF LITERATURE

This chapter presents the literature reviewed in the area of under-three malnutrition and nutrition education communication (NEC) intervention strategies to improve the nutritional status as well as feeding practices for children below three years. The review is presented under the following heads:

- Prevalence of childhood malnutrition.
- Malnutrition: When does it peak?
- Consequences of malnutrition.
- Causes of malnutrition.
- Malnutrition and Care.
- Caregiving behaviours.
- Resources for Care.
- Characteristics of child that affect Care.
- Need for understanding and strengthening Caregiving behaviours.
- Community based NEC interventions for improving Care and feeding behaviours.
- Women's Groups as change agents.

Prevalence of Childhood Malnutrition

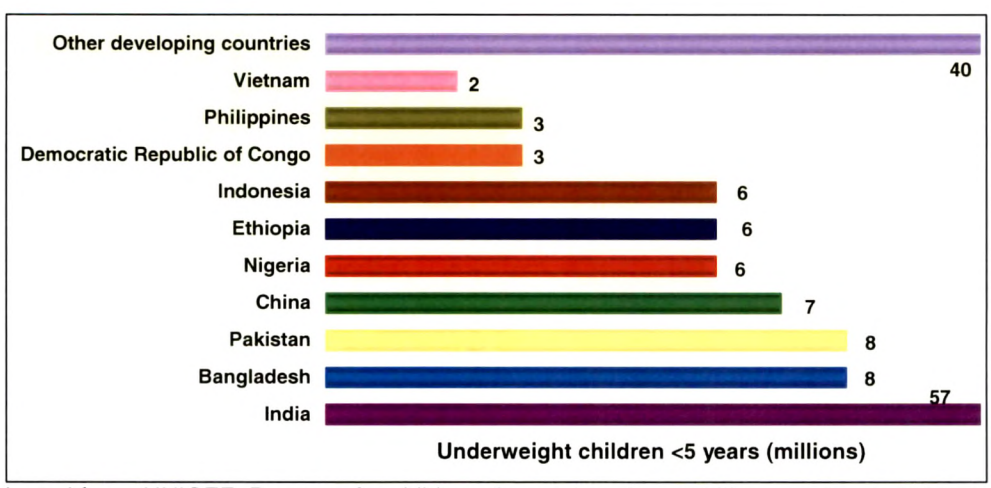
Worldwide Trends

With the deadline for achieving the Millennium Development Goals (MDGs) coming closer, it is clear that the key targets for health and nutrition agreed by heads of state will be missed (Nullis-Kapp 2004) unless progress towards achievement is accelerated. Attainment of several MDGs depends upon achievement in area of women and child nutrition, for example: achieve universal and primary education (Goal 2), promote gender equality and empower women (Goal 3), reduce child mortality (Goal 4) and improve maternal health (Goal 5).

More than one fourth (26%) of the world's children (under 5 years) are moderately to severely underweight and still more (30%) are stunted. South Asia has by far the highest levels of underweight (low weight-for-age 46%), stunting (low height-for-age 44%) and wasting (low weight-for-height 15%) affecting all under-five children in the region (UNICEF 2006).

In the developing world, one out of every four children under five years old – 27%– is underweight, based on the most recent estimates. Of these children, nearly three quarters live in 10 countries (**Figure 2.1**). Among these countries, India, Bangladesh and Pakistan together account for half the world's underweight children, despite being home to just 29 per cent of the developing world's under-five population (UNICEF 2006).

Figure 2.1 Children Under Five Years Who are Underweight in Developing Countries (Number in Millions)



Adapted from: UNICEF, Progress for children. A report card on nutrition, number 4, 2006

The Picture of Malnutrition in India

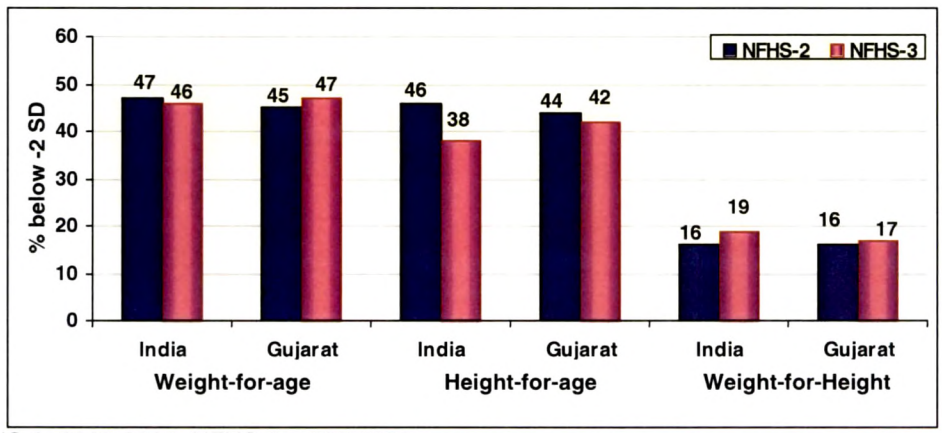
Figure 2.2 highlights the high prevalence of underweight, stunting and wasting in India. There has been only a marginal reduction in percentage of children having underweight and stunting, while wasting increased during the six year period from National Family Health Survey-2 to 3 (NFHS-2 to NFHS-3). The proportion of children (under five years) who are severely undernourished (more than three standard

deviations below the median of the reference population) is also notable - 24% according to height-for-age and 16% according to weight-for-age.

Overall, girls and boys are about equally undernourished. As regards region wise prevalence undernutrition (weight-for-age below –2SD) is substantially higher in rural areas (44%) than in urban areas (30%) (NFHS-3 2005-2006).

Gujarat, despite being among the better developed states on the economic front, also has markedly high prevalence of undernutriton similar to the national figures (**Figure 2.2**). The Multi Indicator Cluster Survey carried out in 2001 in Vadodara slums revealed that about 49%of the children (below 5 years) were stunted and 17% were wasted.

Figure 2.2 Prevalence of Malnutrition in India and Gujarat: Children Under Three Years



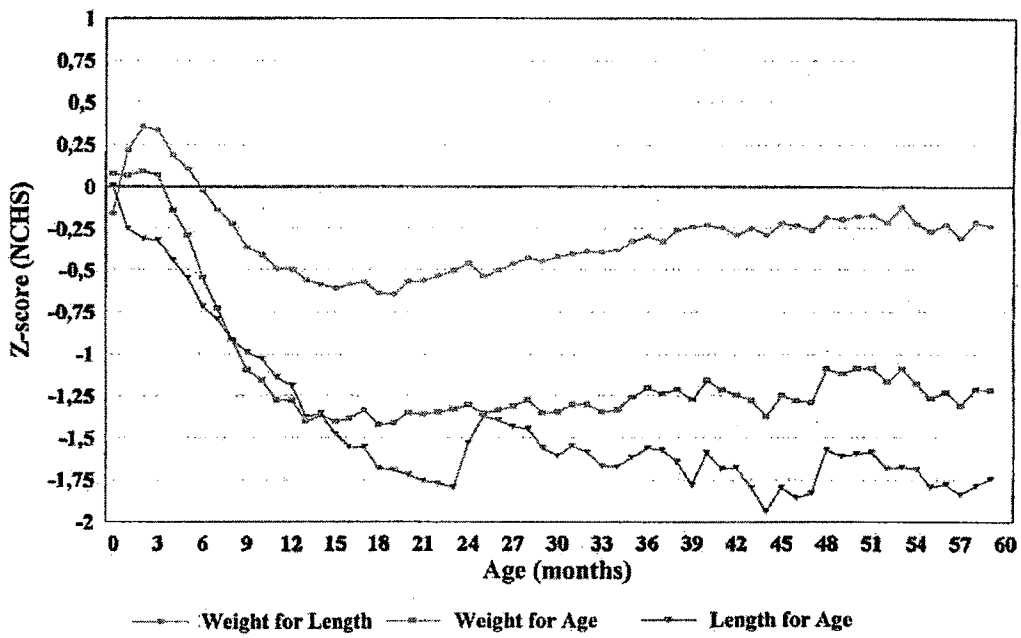
NFHS-3: 2005-2006, NFHS-2: 1998-1999

Malnutrition: When Does it Peak?

Children are at highest risk of nutritional deficiency and growth retardation between the ages of 6 and 24 months. The deficits acquired at this age are difficult to compensate for later in childhood (Martorell et al 1994). **Figure 2.3**, further presents the age-specific patterns in growth faltering among children throughout the world. Mean weights start to falter at about 3 months of age and decline rapidly until about 12 months, with a markedly slower decline until about 18 to 19 months and a catch-up

pattern after that. Growth faltering in weight-for-length/height is restricted to the first 15 months of life, followed by rapid improvement. For length/height-for-age, the faltering starts soon after birth, falling more sharply upto 24 months; and this decline in lasts well into the third year. Thus interventions should be sustained until the third year of life because faltering continues until this age (Shrimpton et al 2001).

Figure 2.3 Global Mean Weight-for-Age, Length-for-Age and Weight-for-Length



Source: Shrimpton et al 2001

Consequences of Malnutrition

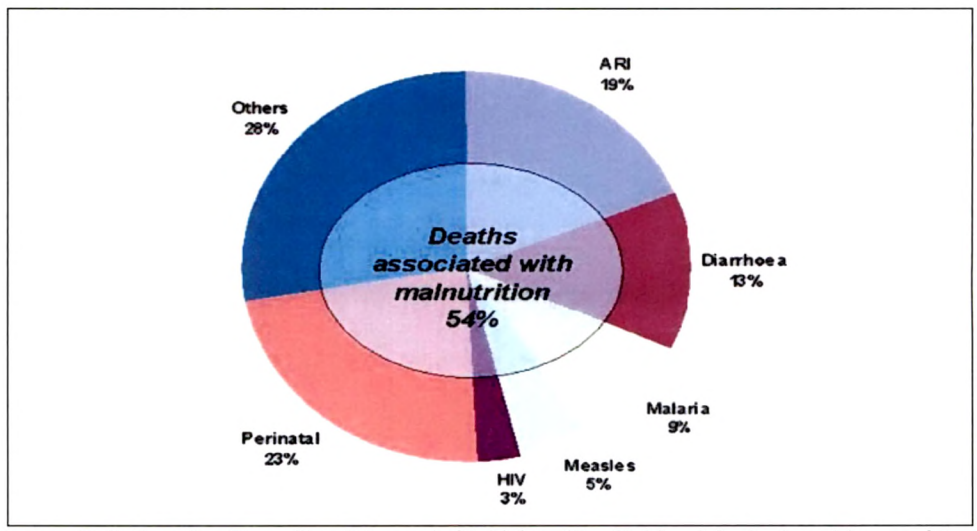
Poor nutrition during the critical formative years of infancy and early childhood has both immediate and long-term consequences.

Disease-Nutrition Interaction

Malnourished children suffer from impaired immunity, which increases the likelihood of infection. Underweight children also tend to have more severe illnesses, including diarrhoea and pneumonia. Disease, in turn, can cause poor nutrient absorption, altered metabolism, and lack of appetite, leading to inadequate nutritional intake (Caulfield et al 2004, Alderman et al 2005). As **Figure 2.4** shows, undernutrition is an underlying

cause of an estimated 54 % of all under five deaths (Pelletier and Frongillo 2003) and majority of these deaths are associated with mild or moderate rather than severe malnutrition. Eliminating malnutrition would remove one-third of the global burden of disease and increase child survival (Mason et al 2003).

Figure 2.4 Major Causes of Death Among Children Under Five, Worldwide, 2000



Source: Pelletier D, Frongillo EA and Habicht JP. Epidemiological evidence for the potentiating effect of malnutrition on child mortality. American journal of Public Health 83(8): 1130-33, 1993.

Reproductive Health

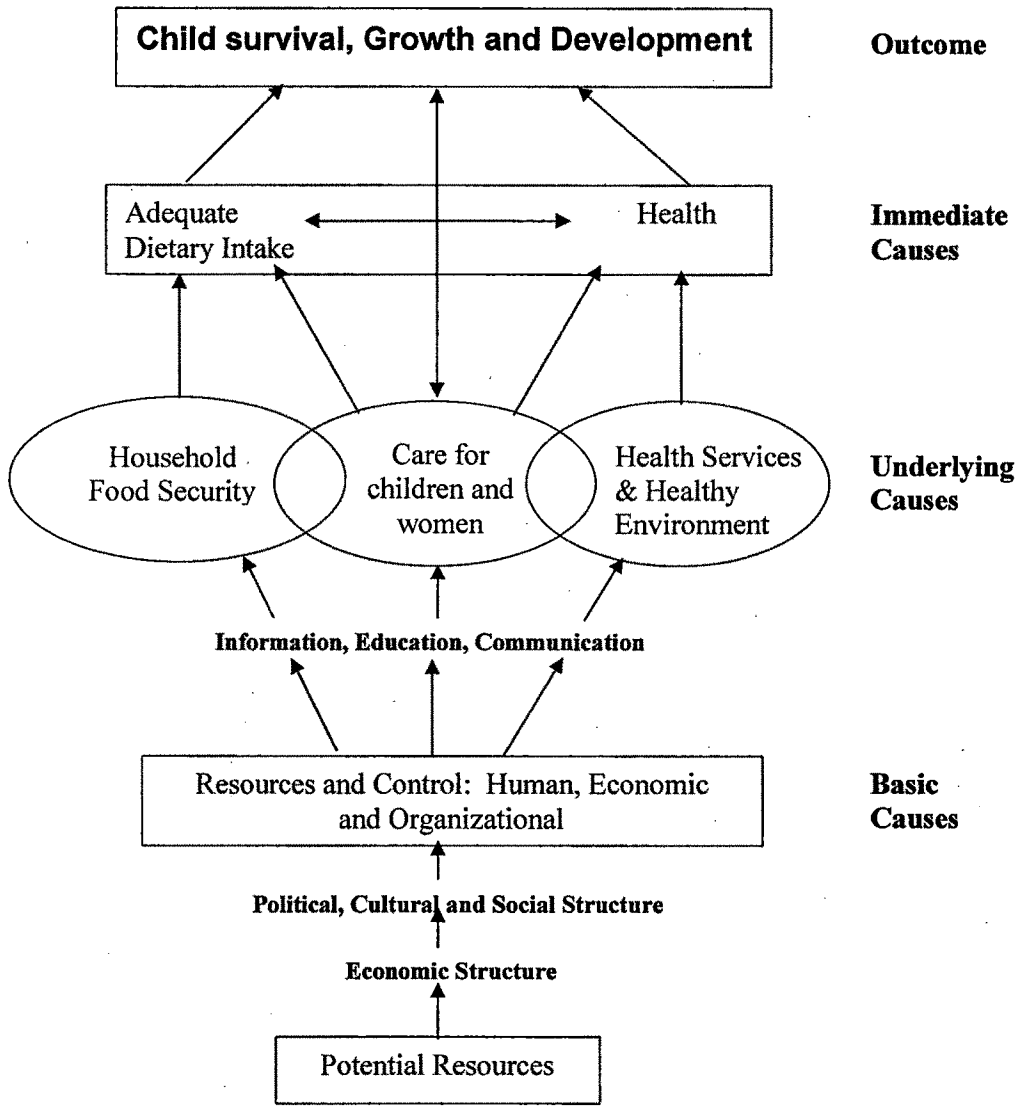
For girls the consequences of stunting are heightened risks of obstructed labour during child-birth since stunting affects the size of the birth canal (pelvic size). In addition, a stunted woman is more likely to give birth to a low weight baby. Thus nutritional stress during young childhood affects the health of women and consequently, the next generation (AED 1999).

Poor Cognitive Development and Lowered Physical Work Capacity

Early childhood stunting is closely associated with poor cognitive and educational performance in children (Pollitt et al 2007). Stunting and underweight result in reduced physical work capacity. Adults who survive malnutrition as children are less

physically and intellectually productive and suffer from higher levels of chronic illness and disability (UNICEF 1998). Productivity losses, poor cognitive development, and increased health care costs in malnourished populations lead to significant economic losses at both the individual and national level.

Figure 2.5 A Conceptual Framework by UNICEF



Source: UNICEF, 1990.

Causes of Childhood Malnutrition

Figure 2.5 depicts the UNICEF conceptual model for childhood malnutrition. The framework is comprehensive, incorporating both biological and socioeconomic causes, and encompasses causes at both micro and macro levels. It recognizes three levels of causality corresponding to immediate, underlying, and basic determinants of child nutritional status.

Immediate Cause

The immediate causes of malnutrition and death are inadequate dietary intake and/or disease. Dietary intake must be adequate in quantity and in quality, and nutrients must be consumed in appropriate combinations for the human body to be able to absorb them. A child with inadequate dietary intake is more susceptible to disease. In turn, disease depresses appetite, inhibits the absorption of nutrients in food, and competes for a child's energy.

Underlying Determinants

The immediate causes of malnutrition are, in turn, influenced by three underlying determinants:

- Food security
- Adequate care for mothers and children
- A proper healthy environment and access to health services

Associated with each is a set of resources necessary for their achievement.

A key factor affecting all underlying determinants is poverty. Poor households and individuals are unable to achieve food security, have inadequate resources for Care, and are not able to utilize (or contribute to the creation of) resources for health on a sustainable basis.

Basic Determinants

Finally, the underlying determinants of child malnutrtion (and poverty) are, in turn, influenced by basic determinants. The basic determinants include the potential resources available to a country or community, which are limited by the natural

environment, access to technology, and the quality of human resources. Political, economic, cultural, and social factors affect the utilization of these potential resources and how they are translated into resources for food security, Care and health environments and services.
(Smith and Haddad 1999)

Inter-Generational Cycle of Malnutrition

There is also gender dimension to malnutrition (**Figure 2.6**). For several females, gender discrimination begins at birth, often continuing throughout childhood and adolescence, resulting in lower levels of education, higher workloads, less access to health care and possibly, also to reduced food intake. Malnourished women have a lower capacity to care for their own and their family's nutritional needs and are at a higher risk of having low birth weight babies. This inter-generational cycle serves to perpetuate malnutrition and needs urgent attention (Gujarat State Nutrition Policy 1998).

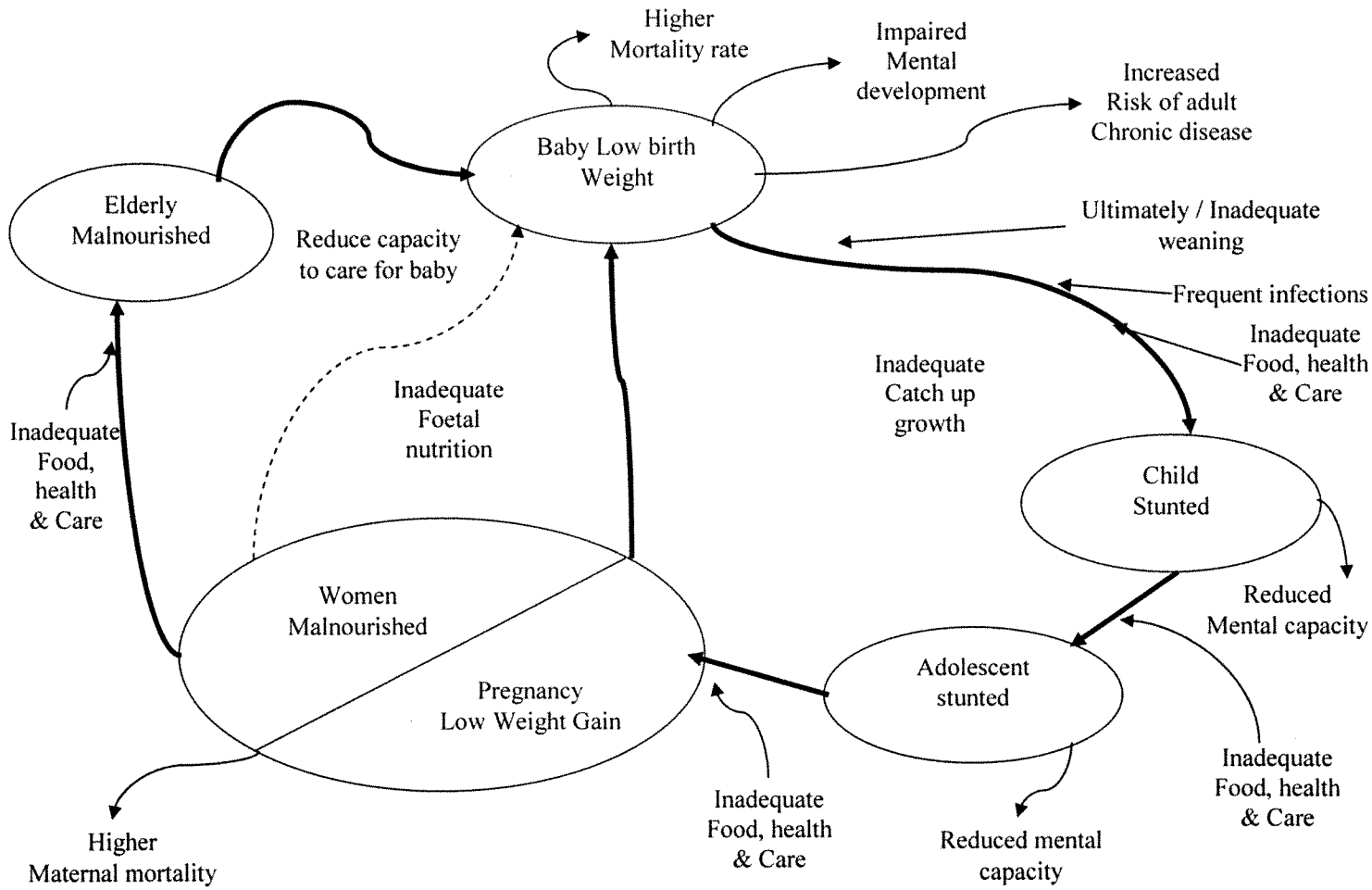
Role of Care in Malnutrition Control

It has been established that even when poverty causes food insecurity and limited health care, enhanced Caregiving can optimize the use of existing resources to promote good health and nutrition in women and children (UNICEF 1998, Engle et al 1992). In fact, it is under these circumstances that Care is most important.

The Definition of Care

'Care refers to Caregiving behaviours such as breast feeding, diagnosing illnesses, determining when a child is ready for supplementary feeding, stimulating language and other cognitive capacities and providing emotional support' (Engle 1992). Care is of importance for young children because the infant and the young child up to age three years almost totally depends on others for food and therefore for good nutrition (Latham 1995).

Figure 2.6 Nutrition throughout the life cycle



Source: ACC/SCN. 4th Report on the world nutrition situation, Sub-Committee on Nutrition, 2000.

Sharma and Kanani, 2008

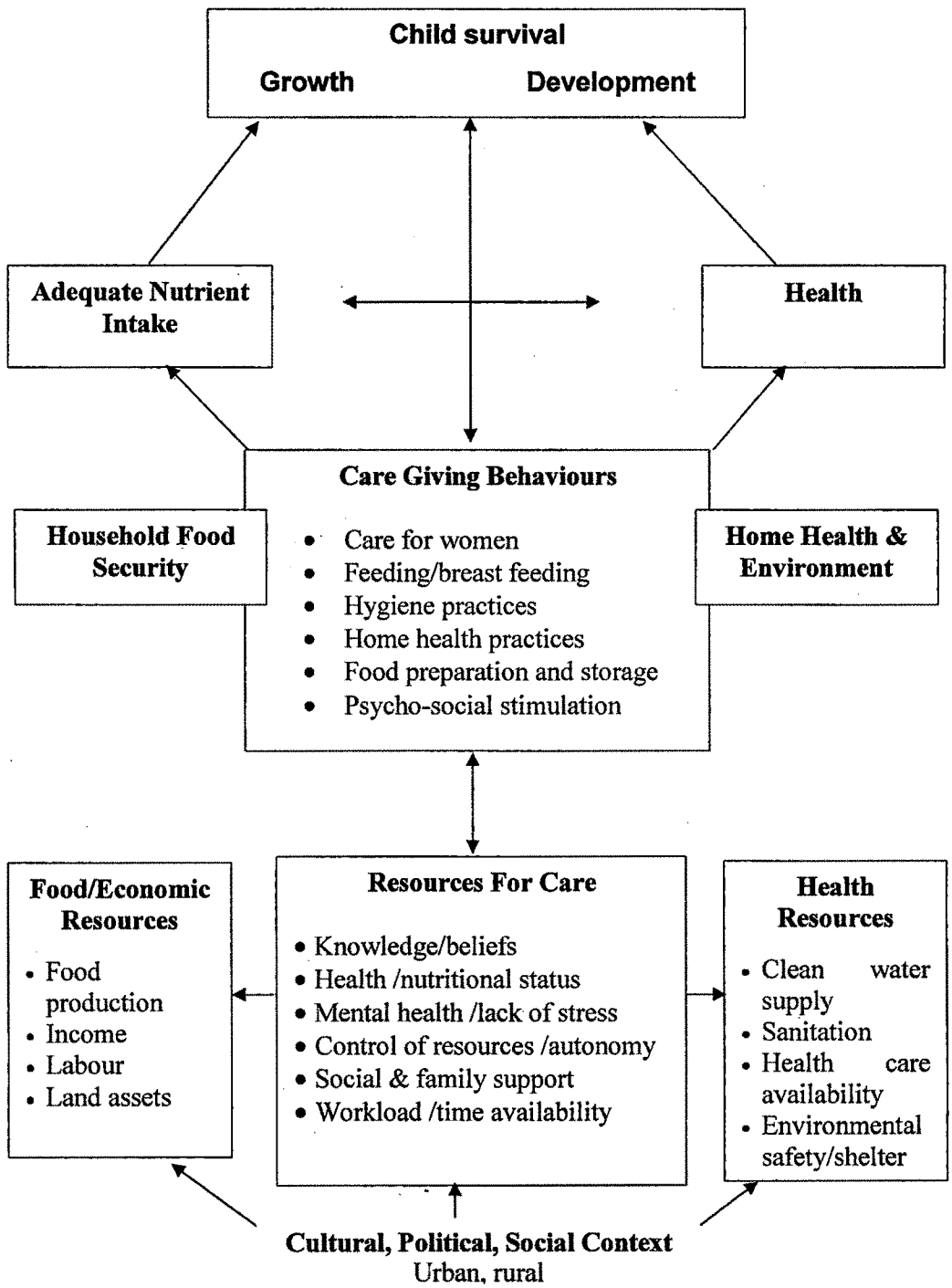
It was observed in Accra (Ghana), that good Care practices can mitigate the negative effects of poverty and low maternal schooling on children's nutritional status. The study on 475 households in Accra confirmed that maternal schooling was an important resource for provision of good child Care and that good Caregiving practices (related to child feeding and use of preventive health services) were in turn a strong determinant of children's HAZ, specially among children from lower income households and children whose mothers had less than secondary schooling. In fact, good Care practices could compensate for the negative effects of poverty and low maternal schooling on children's HAZ (Ruel et al 1999).

Ghosh (1997) has argued that the high rates of malnutrition in India are not primarily caused by poverty; rather, the behaviours (Care practices) of delayed initiation of breastfeeding, early introduction of water and liquids and delay in complementary feeding result in a period of 'perpetual hunger for the child'. Thus, Care practices have an effect on child growth independent of income and socio-economic level.

Child rearing practices were studied in rural Telengana, among 550 households for children 1-5 years with a focus on positive deviance. Various maternal behaviours were found to be associated with positive deviants (well-nourished, resource poor children): mother breastfeeds or provides food to the child on demand, mother complies with child's request for food even if in a hurry to go to work or is tired, mother gradually stops breastfeeding by giving solid foods, mother insists/scolds child to wash hands before feeding, mother teaches child to eat neatly if child messes with food and mother teaches child about personal hygiene/cleanliness during toilet training. The authors concluded that those Caregivers, who behave and interact responsively and consistently, tend to rear children with better growth and development, even in the face of multiple socio-economic deprivations (Aruna et al 2001).

The capacity and ability of the Caregiver and the family to provide Care can be assessed using the extended model (**Figure 2.7**) of child Care (UNICEF 1990).

Figure 2.7 The Extended Model Of Care



Source: UNICEF 1990

Caregiving Behaviours

Care of the young children can be divided into behaviours that bring the child up to a minimally healthy level or return it to a previously accepted status of health or development (compensatory care), and those that serve to enhance further growth and development (enhancement care) (Zeitlin et al 1989). The Caregiving behaviours of the Caregivers translate food in the household, sanitary facilities, and health services into good nutrition for children (Engle et al 2000).

Caregiving behaviours, can be grouped into various activities practiced by the mother:

1. Breastfeeding and complementary feeding of young children
2. Hygiene practices
3. Home health practices
4. Psychosocial Care
5. Care for girls and women

The key Caregiving behaviours of relevance in this study are related to breastfeeding, complementary feeding, food safety and hygiene.

Infant and young child feeding practices in the community are strongly influenced by what people know, think and believe about these issues. They are strongly affected by social circumstances, economic factors and other forces beyond an individual's intention and ideas (Dobe 2002).

Therefore, it is necessary to know about the different aspects of infant and young child feeding practices such as initiation of breastfeeding, colostrum feeding, prelacteal feeding, exclusive breastfeeding (EBF) for 6 months (not even water), timely and appropriate complementary feeding along with continuation of breastfeeding.

First, the global and Indian recommendations on breastfeeding and complementary feeding are presented, followed by the scenario in India. **Box 2.1** gives the key areas covered under recommended infant and young child feeding practices, which have

been described in detail in 'Guiding Principles for Complementary Feeding of the Breastfed Child' (PAHO/WHO 2003).

Box 2.1 Guiding principles for infant and young child feeding (PAHO/WHO 2003) – the Key Areas Covered

- Exclusive breastfeeding till six months of age; thereafter introduction of complementary foods.
- Maintenance of breastfeeding till two years of age.
- Responsive feeding: assisting older children, feeding patiently, encouraging children to eat, but not force feeding.
- Safe preparation and storage of complementary foods including hand washing and use of clean utensils.
- Amount of complementary food needed appropriate for child's age.
- Food consistency according to child's age.
- Meal frequency and energy density according to child's age.
- Nutrient content of complementary foods including dietary diversity.
- Use of vitamin-mineral supplements or fortified products for infant and mother.
- Feeding during and after illness.

Initiation of Breastfeeding

Breastfeeding should be initiated within half an hour of birth (BPNI 2001) because babies are most active during first 30-60 minutes, suckling reflex is most active at birth, ensures intake of colostrum – the first feed and first immunization of the baby –, promotes emotional bonding between the mother and child, prevents the problem of breast engorgement, postpartum bleeding and helps uterine involution in mothers.

Although breastfeeding is nearly universal in India, very few children are put to the breast immediately after birth. According to the NFHS-3 data (2005-2006) only one-quarter of children started breastfeeding within one hour of birth, and almost half (45%) did not start breastfeeding within one day of birth. Similar low rates of initiation of breastfeeding were prevalent in Gujarat (28% within one hour of birth, 58% within one day of birth). A study conducted by Kanani and Gadre (2003) in urban as well as rural Vadodara revealed that very few mothers (30%) had practiced timely initiation of breastfeeding, mothers in rural areas delaying breastfeeding for longer periods than the urban mothers (initiating breastfeeding after 10 hours of birth: 55% rural, 13% urban).

Colostrum Feeding

Colostrum is highly nutritious and contains anti-infective substances. Thus feeding colostrum to the baby helps in building stores of nutrients and anti-infective substances (antibodies) in the baby's body. The anti-infective substances protect the baby from infectious diseases such as diarrhoea, to which the child might be exposed during the first few weeks after birth.

In India, the common practice of delaying initiation of breastfeeding deprives the new borns from the concentrated source of anti-infective properties, vitamin A and protein available in colostrum. Further, some mothers consider this first milk as something dirty and indigestible (National Guidelines on Infant and Young Child Feeding 2006). According to Shariff and Farsana (1990) most mothers in Bangalore (rural as well as urban areas) discarded colostrum, describing it as 'pus', 'dirt' and spoilt milk left over from the earlier lactation period. From these, mothers in rural areas believed colostrum would stick to the infant's intestines, making it difficult for them to digest food and may cause colic and diarrhoea. While mothers from urban areas regarded discarding of colostrum as a way of cleaning the breasts, which was believed to regularize the flow of breast milk.

Prelacteal Feeding

Prelacteal feeds (that is, giving liquids or foods other than breast milk prior to establishment of regular breastfeeding) like glucose water, honey, *ghutti*, animal milk, or powdered milk, deprive the child of the valuable nutrients and protection of colostrum and exposes the newborn to the risk of infection (Mukuria et al 2006).

According to the NFHS-3 survey (2005-2006) in India, other than breast milk, most mothers (57 %) gave prelacteal feeds like milk, honey (often given as part of a blessing ceremony), sugar or glucose water, and plain water to their last-born child in the three days after delivery. In Gujarat more than half (57%) of the children were fed prelacteals. This practice was more common in rural areas than in urban areas in India.

Exclusive Breastfeeding

Breastfeeding is an unequalled way of providing ideal food for the healthy growth and development of infants. Exclusive breastfeeding means that babies are given only breast milk and nothing else – no other milk, food, drinks and not even water (National Guidelines on Infant and Young Child Feeding 2006).

Unfortunately exclusive breastfeeding at 6 months is not a common practice in developed countries and appears to be rarer still in developing countries (WHO 2002 a). Although India is a country very supportive of breastfeeding, truly exclusive breastfeeding is quite uncommon, as mothers begin to supplement with top milk and water in child's first months (Engle 2002). NFHS-3 data reported that in India only 46 % of children <6 months and 51% children 2-3 months of age were exclusively breastfed. Aneja et al (2001) reported in sample of 115 children that 20% children were exclusively breastfed (EBF) till 5 to 6 months of age; and 41% till only two months of age. Studies in Vadodara have also revealed low rates of exclusive breast feeding (till 6 months of age), ranging from 0-22% (Kanani et al 2005).

Timely and Appropriate Complementary Feeding

Complementary feeding is defined as the process starting when breast milk alone is no longer sufficient to meet the nutritional requirements of infants, and therefore other foods and liquids are needed, along with breast milk. The worldwide consensus is that six months is the appropriate age at which to introduce complementary foods (PAHO/WHO 2003).

Table 2.1 indicates that breastfeeding and complementary feeding practices in many parts of the world are suboptimal. Either the complementary foods are introduced earlier than is desirable; or their introduction is inappropriately delayed owing to misconceptions (Daelmans and Saadeh 2003). Further, complementary foods fed to infants in the second six months of life (and beyond) are often inadequate in energy density, protein, and micronutrient concentration or quality. The frequency and amounts of these foods that are offered may be less than required for normal growth,

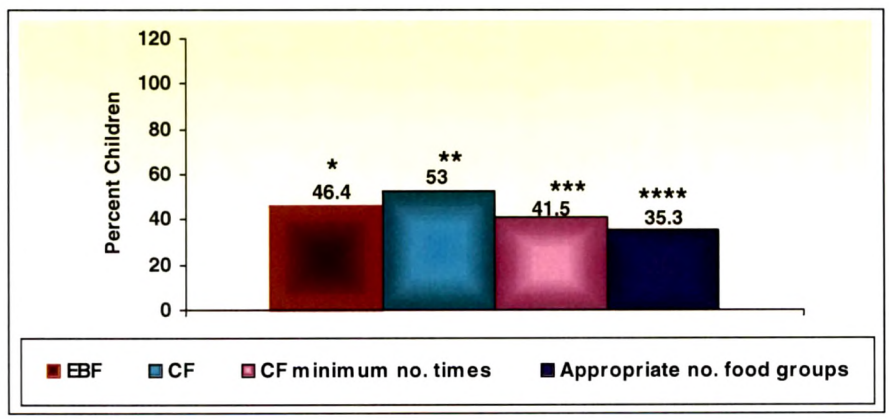
or their consistency or energy density may be inappropriate in relation to the child's needs (Ruel et al 2003). Also, the feeding behaviours or feeding styles are inappropriate and contribute to poor intake of complementary foods among young children (Daelmans and Saadeh 2003).

Table 2.1 Region Wise Summary of Key Breastfeeding and Complementary Feeding Indicators

Region	Percent children (1996-2005)		
	Exclusive breastfeeding (<6 months)	Breastfeeding with CF (6-9 months)	Continued breastfeeding (20-23 months)
World	36	52	46
Sub-Saharan Africa	30	67	55
Middle East and North Africa	30	59	24
South Asia	38	47	69
Latin America and Caribbean	-	49	26
Developing Countires	36	52	46
Least Developed countries	34	64	65

Source: UNICEF 2007

Figure 2.8 Infant and Young Child Feeding Practices in India (6-23 months)



Source: NFHS-3 2005-06

* Exclusive breast feeding(EBF): <6 months, ** Children 6-8 months given complementary foods, *** Children 6-8 months fed solid/semi-solid food at least twice a day, ≥3 time/day for other breastfed children and ≥4 time/day for non-breastfed children, **** ≥3 food groups for breastfed children and ≥4 food groups for non-breast fed children

Indian data also reveals similar dismal trends with regard to IYCF practices which have not improved substantially from NFHS-2 (1998-99) to NFHS-3 (2005-06). According to NFHS-3 only about half of the children are exclusively breastfed, receiving complementary foods at the right time and one third are fed appropriate number of food groups (**Figure 2.8**).

The quality of complementary foods fed is also poor with only one third of breastfeeding children and half of non breastfeeding children (6-23 months) consuming fruits and vegetables that are rich in vitamin A and only 10% of breastfeeding children and 20% of non breastfeeding children under three years of age consuming meat, fish, poultry, or eggs (NFHS-3 2005-2006). Feeding practices are somewhat better in urban areas than in rural areas.

A study on IYCF practices included of 155 children (6-<12 months) and their mothers attending the "Maternal and Child Health Clinic" from two urban slum communities of Delhi. It was observed that only 47% children were consuming semi-solids at 6 to 7 months of age. The most common complementary semi-solid food given was khichri followed by dhal and rice. More than three fourth of the mothers fed their children less number of times than recommended (≤3 times instead of 5 times). Further, there was a relationship between type of food consumed (solid foods) and nutritional status as well as nutrient intake of the children. Late introduction of semi-solid and solid foods, dilution of top milk, faulty weaning practices including the use of bottle milk by the mothers were among the possible etiological factors for malnutriton in the study children as suggested by the authors (Aneja et al 2001).

Hygiene Practices

Hygiene practices directly affect the cleanliness of the environment and the number of infectious agents children ingest, either through contaminated food or water, or by placing contaminated objects in their mouths. Dirty water, lack of hand washing and contaminated foods are among the factors that account for high rates of diarrhoea during first few years of life. Very young children are particularly susceptible as their

immunity is less developed (Martorell and Woodruff 1998). Hence the Caregivers must follow appropriate hygiene practices relatd to food such as:

Food hygiene: Foods should be cooked thoroughly and fed as soon as they are cool enough to eat. Washing dishes and cooking utensils and cleaning the cooking area also reduce risks of contamination. In addition, use of fermented foods can reduce the risk of microbial contamination (Kimmons et al 1999) and has the added advantage of improving nutrient content (WHO 1998).

Personal and household hygiene: Personal hygiene practices affect the level of contaminants. Caregivers need to wash their hands with soap before handling cooked foods and feeding children, after defecation and after handling children's wastes. They should maker sure that children's hands are kept as clean as possible (especially after defecation and before feeding) and that children are bathed. Household environment must be kept clean and safe water should be used.

In a compilation of series of studies of the Foods and Nutrition Department on the IYCF practices and perceptions (over the years 2000 – 2005) by Kanani et al (2005) nearly half of the women reported having feeding leftover foods to the children and felt that this was perfectly safe. Less than half of the mothers reported washing of hands before cooking meals for children and even fewer (16-22%) reported washing hands with soap before feeding infants. Very few (30%) women understood the importance of clean hands before cooking and feeding children. Further, maternal handwashing before cooking food for child was found to be significantly associated with morbidity of child (last fifteen days).

Studies have explored the relationship between hygiene practices and incidence of diarrhoea as well as child growth. Studies in Bangladesh, Pakistan and Nicaragua found following unhygienic practices to be associated with high incidence of diarrhoea:

- Use of dirty saris by mothers to clean utensils or blow noses.

- Feeding stale food kept for over 12 hours after cooking eventhough kept covered.
- Lack of domestic cleanliness and presence of flies in environment.

(Stanton and Clements 1987, Zaman et al 1993 and Gorter et al 1998).

In Nicaragua study more maternal schooling produced better hygiene behaviour.

Other caregiving behaviours are briefly described below.

Home Health Practices

Studies conducted in a variety of countries show that 70-80% of health care treatment is performed at home by women, particularly by mothers (World Bank 1994). Good home health practices help prevent illnesses, and through good treatment reduce the negative impact that illnesses have on children's growth and development.
According to Engle et al (2000), home health practices include:

Home management of illness: Caregivers should recognize and diagnose diarrhoea and provide home remedies including oral rehydration solution and should increase feeding during illness and convalescence.

Utilization of health services and protection from pests and parasites: For example timely seeking of curative health services when children cannot be adequately treated at home.

In Sri Lanka, De Silva et al (2001) examined the health-care seeking practices of mothers with 2248 children <5 years of age in 60 villages and reported a high prevalence of acute respiratory infections (82.0%) and diarrhoea (14.8%). Although malnutrition was highly prevalent it was not recognized by mothers as an illness. For most illness episodes in children, the mother sought outside care and treatment from both private and public sectors with majority seeking care in the private sector. Seeking outside care is a possible explanation for the low level of childhood mortality despite the prevalence of a high rate of malnutrition.

In a longitudinal study in Pakistan, which followed children at 6 months of age, it was found that during a diarrhoeal episode the mothers from the upper middle class took timely medical help, fed ample food and Oral Rehydration Salts (ORS) to the sick infants. The mothers from the village and periurban slum took the sick child, mostly after the second day of illness, to a doctor but preferred home remedies. (Zaman et al 1993).

Psychosocial Care

Psychosocial Care refers to the provision of affection and warmth, responsiveness to the child and the encouragement of autonomy and exploration. Social, emotional and cognitive interactions between Caregivers and children influence both growth and development of children (Engle and Ricciuti 1995). Elements of psychosocial Care include **responsiveness** (for example feed children when hungry), **attention, affection and involvement, encouragement of autonomy, exploration and learning.** All these can improve children's intellectual development and nutritional status (Engle et al 2000).

There is considerable evidence that poor psychosocial Care is associated with unfavourable cognitive development and poorer nutrition and growth outcomes in young children in both industrialized and developing countries. Mothers or other primary Caregivers of malnourished children have been reported to be less sensitive to the child's needs, less involved and emotionally responsive, and less engaged in reciprocal interaction with their children than mothers or other primary Caregivers of adequately or well-nourished children (Engle and Ricciuti 1995).

Resources for Care

In order for Caregivers to perform Care practices, they must have resources for Care. Resources for the provision of Care may be human, economic or organizational, which contribute to Care at the family, community, national and international levels. Human resources at the family level include the Caregivers knowledge, beliefs, education levels and their own health. Economic resources include Caregivers control of

resources and time available. Organizational resources include family and community support such as sharing of workloads and supervision of children (Jonsson 1995). These resources have direct effect on Care practices and therefore on child growth and development. They also have indirect effects through household food security and use of health services and the healthiness of the environment on child growth and development (Engle et al 1997 a).

Equally important is Care for Girls and Women. Caring for a woman is important for its own sake and not merely because she is a mother. This aspect needs to be emphasized in women's health and nutrition programs. Gender sensitive Care includes the following (Engle et al 1997 a):

1. Care during pregnancy and lactation
2. Reproductive health
3. Physical health and nutritional status
4. Mental health, stress and self-confidence
5. Autonomy and/or respect in the family
6. Workload and time
7. Education

1. Care during pregnancy and lactation

The health and nutritional status of the pregnant and lactating mothers are critical for the outcome of pregnancy and subsequently for children's growth and development. Poorly nourished mothers have higher rates of miscarriage, stillbirth and maternal mortality. Children born to anemic mothers are often stunted and ill. Children born to iodine-deficient mothers may be apathetic, retarded or have congenital abnormalities. The mother's vitamin A status directly affects the infant's intake through breastmilk consumption and affects the child's resistance to diseases. Further, workload during pregnancy has a significant effect on birthweight (Launer and Habicht 1989).

Therefore, during pregnancy and lactation, the family should support the women in obtaining extra and higher quality foods, reducing workloads, attending antenatal clinics and obtaining safe birthing and receiving adequate postpartum rest. Fathers can make especially important contributions during this period.

2. Reproductive health

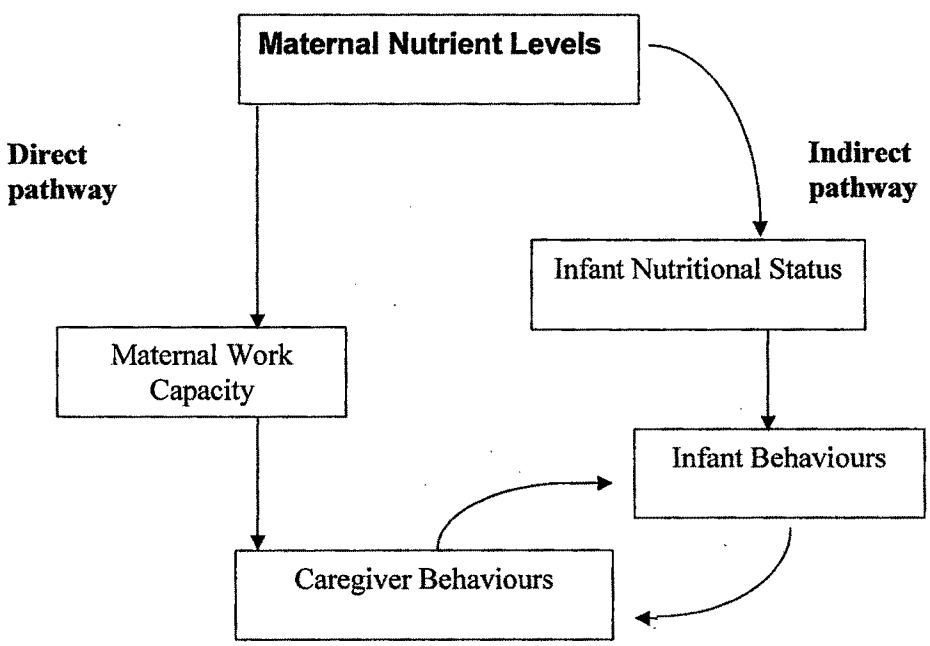
When girls begin childbearing before their own growth has been completed, risks both for them and their children are greater. Families can support adolescent girls in delaying their age at first birth and support women in their use of family planning.

Supporting women in spacing births allows them to have increased time following delivery before subsequent pregnancies, enabling them to replenish nutrient stores and have more time for the care of each child. Children born following short birth intervals have higher infant mortality and higher rates of malnutrition.

3. Physical health and nutritional status

Nutrition needs to be seen from a lifespan perspective. The nutritional status of the young girl will play a significant role in the birth weight and subsequent nutritional status of her children. Families can care for women by ensuring them a fair share of the family food and resources at all ages and protecting them from abuse.

Figure 2.9 Maternal Health and Caregiving



Source: Winkvist 1995

The linkage between Caregiver nutritional status and Caregiving has rarely been studied. There are two possible pathways for linking maternal health to Caregiving (**Figure 2.9**).

- A direct link between nutritional status and Caregiving capacity and practices through maternal energy levels.
- An indirect link whereby the biological consequences of malnutrition for the pregnant and lactating woman could affect the characteristics of her child, both physical and behavioural, which in turn could affect Caregiving practices.

The direct link: Malnutrition, reproductive tract infections, AIDS, menstrual disturbances, and gender-based abuse affects millions of women worldwide, draining their physical and emotional energy. Some of the child caring activities require physical effort, whereas others require attention, imagination, and inspiration. Therefore, ill health of the Caregiver leading to reduced work capacity, fatigue, apathy, or depression will likely limit Caregiving ability, as will ill health leading to reduced status in the family with resulting decreased access to resources and support (Winkvist 1995). Women between the ages of 15 and 49 spend a significant proportion of their lives in a state of pregnancy or lactation, or both, and the stresses of these periods may lead to a considerable depletion of maternal nutrient levels (Merchant et al 1989, McGuire and Popkin 1989).

The indirect link: Maternal nutrition has a strong influence on the pregnancy outcome, particularly birth weight (Abrams 1991). It has been found that combination of a high birth order and short interval between pregnancies alone is associated with increased risk of premature births and low birth weight (Miller 1994 and Mavalankar et al 1992). A malnourished, lethargic child may get less attention from an overworked mother.

Only a few studies have been identified that directly examine the effect of Caregivers' health and nutrition status on Caregiving capacity.

Forty-one mother child pairs from semi-rural Egyptian households were studied to assess the association between diet during lactation and infant behaviour, and Caregiver infant interaction. It was found that mother's deficient intakes of animal source foods and certain B vitamins were the strongest indicators for infant drowsiness (a proxy for activity and alertness). Alertness of children was further compromised when there were several children in the households. The small, less vocal and less alert infants received less vocalization and Care from mother. The authors concluded that in this environment, infants of undernourished mothers may not receive the extra Care and stimulation needed and are at risk for subsequent developmental difficulties (Rahmanifar et al 1993).

McCullough et al (1990) found in Egyptian mothers that those having marginal vitamin B6 status (indicated by low vitamin B6 concentration of their milk) were less responsive to their infant's vocalizations, showed less effective intervention to infant distress, and were more likely to use older siblings as Caregivers than were mothers of better vitamin status. A possible mechanism suggested by the authors was maternal clinical depression as a result of poor vitamin B_6 status. Allen (1993) reported that lower maternal postpartum haemoglobin levels of Egyptian mothers were significantly associated with less response to infant vocalizations. Overall, anemic women spent substantially less time taking Care of their infants.

Maternal undernutrition and child nutrition: In Kerala Sanghvi et al (2001) observed that current maternal body mass index and excessive maternal vomiting in pregnancy were significant risk factors for current child underweight status.

4. Mental health, stress and self-confidence

More confident Caregivers are more active feeders when children refuse food. The Caregivers emotional heath may also affect children's nutritional status through increasing her capacity to be affectionate and responsive to children's needs. Self-confidence and self-esteem are often related to status within the family and society.

When Caregiver's self-confidence improves, they may have a belief that they can take needed actions to improve Care (Engle et al 1997 a).

Similarly, a Caregiver who is experiencing depression or anxiety, or who is living under lot of stress, will find it difficult to provide patient, loving Care. Unfortunately stress, anxiety and even depression appear to be disturbingly common among poor women. Anxiety, little self-confidence and a 'learned helplessness' or passivity often result from the stresses of poverty, low status in the family and community, and lack of control over basic life decisions such as reproduction and child (Engle et al 2000).

A report on slum improvement project in Bangladesh suggested that the social isolation of women and lack of extended family networks in urban areas affects their mental health, and reduces the quality of child Care (UNICEF 1994).
A study was carried out in rural Chad to identify the Caregiver characteristics that influence child nutritional status, when controlling for socioeconomic factors. Sixty-four household with 98 children from ages 12-71 months were part of this study. It was found that Caregivers who reported a positive outlook on life had children with significantly higher height-for-age than children of mothers who were dissatisfied (Begin et al 1999).

5. Autonomy and/or respect in the family

Autonomy and control of resources refers to the Caregiver's ability to play a role in decisions made within the household and the community (Engle et al 1997 b). The low status of women in many cultures means that often they do not have much control over family resources, nor do they have much decision-making power in the household. They may have responsibility for child-rearing without control over the resources to carry out that responsibility (Engle and Ricciuti 1995). The decisions regarding the Care and feeding of young children may be made by the child's father, or in many cases, by a mother-in-law, or older female in husband's family (Engle et al 1997 b).

A number of studies, for example by Haddad and Hoddinott (1994) suggest that mothers are more likely to allocate extra resources under their control to children than are fathers. Women generally enjoy greater autonomy in female-headed households, and studies show that inspite of lower incomes, children in these living situations do better than might be expected, probably because intrahousehold distribution practices favour children more in female-headed households than in households headed by men (Haddad 1992, Johnson and Rogers 1993).

For example, a study in rural Kenya in six villages reported that although headship did not relate significantly with nutritional status of children, it was found that dietary diversity and monthly per capita expenditure on food was significantly higher in female headed households (Onyango et al 1994).

In Amman (Jordan) Doan and Bisharat (1990) explored the association between the mother's position within the household (n= 1341) and her ability to provide health for her children. It was found that weight-for-age of children whose mothers had low autonomy was significantly lower than that of children of mothers with high autonomy whether or not other relatives were present.

Another study in Chad on 98 rural children (12-71 months) examined mother's influence on child nutritional status and found that, children of mothers with influence on child feeding decisions were taller than children of mothers with less influence. Mothers who had inputs in child feeding were also more involved in decisions on household food expenditure (Begin et al 1999).

6. Workload and time

Time is an important economic resource for Care. Women are largely responsible for maintaining household continuity through reproduction and nurturing children, and perform most of the key and energy-demanding tasks for the households. They are also engaged in non-domestic production activities such as agricultural work, informal labour and formal labour market activities. Heavy demands on women's time due to

income-producing and home production activities limit the time available for child Care (Wandel 1992).

Mothers who are not working may be better able to ensure frequent meals and to monitor intrahousehold food distribution to ensure that weaning-aged children get their fair share. On the other hand, mothers who are working may be better able to purchase the more expensive oils, legumes, and animal source proteins needed to provide energy- and protein-dense diets for their weaning-aged children (Leslie 1988).

Dahiya and Sehgal (2002) carried out a study on 50 working and 50 non-working mothers of Hisar city (Haryana), having children aged 6-18 months, to determine the effect of mother's employment on infant feeding practices. Significantly more working mothers breastfed their children for shorter duration of time period and introduced top milk as early as 3 months (as they had to return to their jobs) as compared to lower proportion of non working women.

In Thane (Maharashtra) a study on 252 children (below 24 months) found that more than half of the mothers who resorted to bottle feeding were working and the babies were bottle-fed in the absence of the mother by the child's grandmother or older sibling (Gurav et al 2001).

Literature on the effect of women's employment on children's health and nutritional status reveals a complex relation with positive as well as negative influence. For example, in an evaluation of about 2,000 rural mothers in India, Abbi et al (1991) found that children of mothers who worked in agriculture for 5-6 hours per day were likely to be significantly malnourished if the women did not have control of their earnings. Whereas a study in the Philippines showed that when the income was in the hands of the mother, or when the child was more than one year old, the effects on either child nutrient intake or nutritional status were positive (Blau et al 1996).

7. Education

The excessive workload of women and lack of freedom and mobility often limits their access to educational opportunities as young girls and as adults. Ensuring women's access to education both as children and as adults is an example for Care for women.

Research from all areas of the developing world has shown that maternal education has a consistent positive effect on child health and survival (Caldwell 1981, Chen 1986). More educated mothers may be more assertive and make better use of health services, provide better child Care such as feeding, have more hygienic household practices and personal habits, have an increased knowledge of child rearing, or have higher status in the family and thus more control of family resources.

In a study conducted among 556 households with children less than three years in Accra, Ghana, poor maternal schooling (even when controlling for socioeconomic factors) was found to be the main constraint to good child Caregiving practices related to child feeding, the use of preventive health services, and good hygiene (Armar-Klemesu et al 2000). However, it was also seen that among poorly educated mothers, good Care practices had a large positive effect on children's nutritional status and that Care played less important role among better educated mothers (Ruel et al 1999). Thus it was suggested that nutrition education could be a short-term alternative (to maternal schooling) towards improved child Care and nutrition.

The NFHS-3 (2005-2006) survey in India also found the influence of mother's education on child feeding practices and nutritional status. Initiation of breastfeeding within one hour and avoidance of prelacteals tended to be higher among the more educated mothers as compared to less educated mothers. Further, the percentage of children given food from the appropriate number of food groups and the percentage fed according to three recommended IYCF practices generally increased with the mother's education. Undernutrition also had a strong negative relationship with the mother's education. The percentage of children who were severely underweight was

almost five times as high for children whose mothers had no education as for children whose mothers had 12 or more years of education.

Maternal knowledge and beliefs

Beliefs, attitudes and knowledge about child Care practices can have important influences on child's dietary intake and thus significantly impact on child's development.

For example, research in Bihar (Yadav and Singh 2004) and West Bengal (Bandyopadhyay et al 2000) indicated that about two third mothers discarded colostrum, delayed initiation of complementary foods and were not aware regarding protein energy malnutrition and its causes.

The compilation of studies in urban and rural slums of Vadodara by Kanani et al (2005) revealed that the mothers were not following most of the recommended BF-CF practices. The major highlights of this review were less than 50% of the mothers practiced timely initiation of breastfeeding, gave colostrum, exclusively breastfed (EBF) the child till 6 months and practiced active feeding. As regards hygiene, few mothers washed their hands with soap before cooking or feeding the child and more than half of mothers thought that it was perfectly safe to feed left over food to the child.

Family Support as an Important Resource for Child Caregiving

Family support to the Caregiver can be in the form of help provided to the mother in child Care and sharing of workload for household or agricultural tasks or emotional or informational support. Provision of alternate child Care is one of the most important types of social support (Engle 1997 b).

In African, Asian, Latin American and the Pacific societies, older women, or grandmothers, traditionally have considerable influence on decisions related to maternal and child health at the household level (Aubel et al 2002). The authors

reported from rural Senegal that grandmothers served as primary advisors for all health-related matters to both women of reproductive age and their husbands. They also supervised all maternal and child health practices within the family and were directly involved in caring for young children on a daily basis.

In rural, Eastern Uzbekistan it was found that household strategies and practices related to maternal and child health (MCH) were primarily determined by senior women, or grandmothers and the women themselves had a relatively limited degree of autonomy to adopt MCH practices which were not approved of by these senior women. While many of the practices proposed and used by the grandmothers were beneficial to women and children; some of their practices were not optimal, particularly those related to the nutritional needs of women and children and the nutritional values of local foods (Project Hope Child Survival Project 2003).

In United States, Kannan et al (1999) observed that Asian-Indian American mothers relied more on support of the grandmother for feeding during the infant's first 6 months of life hence it was suggested that grandmothers should be included in nutrition education sessions for improved child feeding practices.

An ethnographic study in United States with low income adolescent African-American mothers and the maternal grandmothers found that complementary foods were initiated much before the recommended age. The maternal grandmother's advice on feeding played a dominant role in deciding what the infant should eat and the timing of introduction of solid foods because the mothers wanted to avoid confrontation and believed that the grandmothers knew more than they did (Bentley et al 1999).

Kanani and Gadre (2003) observed in a comparative study in urban and rural Vadodara that most of the grandmothers (60-80%) were involved in child Care activities like feeding the child, keeping the child clean and playing with the child. They also helped in household tasks, the support being more in urban area than in

rural area. However, most grandmothers had inadequate child feeding knowledge and reported passive feeding behaviours.

In contrast to the above studies, in rural Bolivia, Cross-sectional interviews with 420–502 Bolivian mothers with an infant less than or equal to 1 year of age, showed that the attitudes of the infant's grandmother towards breastfeeding did not influence the infant feeding pattern (Ludvigsson 2003).

Few studies have examined the relationship between family support and child's nutritional status. In rural Chad it was found that Caregivers who received more help to accomplish their domestic or productive tasks had taller children. The number of tasks for which Caregivers received assistance was more important than the task itself (Begin et al 1999). Similarly Caregivers in Jamaica (Kerr et al 1978) and Nigeria (Morley et al 1968) who received less support from the family had malnourished children than Caregivers who received assistance. Thus adverse conditions usually associated with child malnutrition may be tackled to some extent by family or social support (Begin et al 1999).

In Maharashtra and Uttar Pradesh it was observed that caste, type of family and presence of mother-in-law were significant factors associated with the nutritional status of children under five years of age (Griffiths and Mathews 1997).

Fathers are also important as a source of emotional and informational support (Engle and Breaux 1994). Fathers can have a positive effect on Caregiving by supporting mothers in breastfeeding and obtaining health care, sharing more of the workload, providing direct child Care and giving warmth and affection to the child (Engle et al 1997 a) There is some evidence that when they contribute a higher percentage of their incomes to family budgets, children are better nourished (Engle 1993, 1995). Their opinions about child Caregiving can have significant effects on decisions about infant feeding, particularly breastfeeding (Scrimshaw et al 1987).

A study in United States reported that father's education level and his strong approval of breastfeeding was strongly associated with a high incidence of breastfeeding (98.1%), compared to only 26.9% breastfeeding when the father was indifferent to the feeding choice (Littman et al 1994).

Kanani and Gupta in 2002 (Department of Foods and Nutrition) reported that among slum families in Vadodara, more the father's help in household tasks, greater was the number of positive Caregiving behaviours practiced by the mother and better was the child's nutritional status.

How do Children's Characteristics Affect Care?

Not only the behaviours of parents, but also the characteristics of a child will influence outcomes for that child such as: appetite and interest, temperament of the child, capacity of eliciting attention, activity level or nutritional status and gender of the child (Engle et al 1997 a).

Appetite and interest: Children with good appetite and interest in food are likely to eat enough. Unhealthy children are often less hungry and they may demand less food and finish less on their own than healthy children. Factors that reduce a child's appetite may include a monotonous diet, lack of nutrients needed for appetite (e.g. zinc), illness such as diarrhoea, malaria, measles, intestinal parasites, chronic malnutrition, sores in mouth (such as caused by teething) or anxiety (Dettwyler 1986 and 1987). When anorexia is a problem, Caregivers need to actively encourage food consumption, particularly for the child under three. But this means ensuring that Caregivers have the time, knowledge, resources, self-confidence and support to encourage anorexic children to eat.

Temperament of the child: Temperament, a biologically based tendency such as the ease or difficulty with which a child approaches routine and novel situations, also influences Care. A difficult or irritable child will probably evoke different and perhaps less patient Caregiving than a sunny, easy-to-manage child. These individual

differences in temperament and condition have major effects on Caregiving (Engle et al 2000).

Capacity of eliciting attention: Caregivers and children influence each other. For example, children with more advanced motor, social or language development may be more effective in eliciting their caregivers affection and attention. Timid children may also receive less attention when there are many children and few Caregivers. High birth order children (fifth or higher) receive less adult attention.

Activity Level or Nutritional Status: The activity level or nutritional status of the children may also influence the attention they receive: an overworked Caregiver may spend less time with a less active, possibly poor nourished child than with a more active, better nourished child because the well nourished child has the energy to ask for Care, through talking, motor actions and gestures or crying.

Gender of the child: In south Asian countries, girls are less preferred as compared to boys. They are also less likely to receive timely health care, less breastfeeding, a smaller proportion of family food and have higher mortality rates (Haddad et al 1997). The gender effect operates through differential Care practices and allocation of resources within the household.

Need for Intervention Studies: a Focus on Nutrition Education and Communication

The review of literature has revealed that the Caregiving behaviours of mothers especially those related to breastfeeding, complementary feeding and hygiene are inappropriate in India as well as Gujarat.

Effective nutrition education and behaviour change strategies are the nutrition interventions, which can promote optimal breastfeeding and complementary feeding practices (Caulfield et al 1999). In this context, nutrition education refers to the transmission of appropriate information to enable and encourage Caregivers to

improve existing child feeding practices and or types and safety of foods offered. The information or messages may be disseminated through interpersonal contact or formal print or electronic media (WHO/UNICEF 1998).

The following should be considered for planning and implementing nutrition education interventions (Caulfield et al 1999 and Engle et al 2000):

- Before formulating the behavioural and counseling strategy, it is necessary to undertake ethnographic study of health and nutrition beliefs and practices of the community members, and mothers, and their sources of information. This would help to identify and understand the motivating as well as deterrent factors for the Caregivers for improved behaviour.
- Because the Care perspective is family centered, parent's desires for their children should have central significance. Parents want their children to be 'happy and healthy'. The Caregiver/mother should have the time and energy to follow the recommendations hence family is important.
- Programs should incorporate a comprehensive approach to improve infant feeding practices in general, not just complementary foods *per se*. For example review of nutrition education programs by Caulfield et al (1999) revealed that the key messages usually included were: exclusive breastfeeding for four to six months, feeding complementary foods three to five times per day, use of selected nutrient-rich foods or recipes, age-appropriate guidelines regarding the consistency of the foods, feeding during and after illness, hygienic methods of food preparation and storage, and continuance of breastfeeding. Efforts should be made to incorporate nutrition education about complementary feeding into growth monitoring and health programs because such integrated approaches have shown success in improving child growth.

The **nutrition education messages** and their communication for improved feeding practices if based on locally appropriate feeding recommendations, have proven to be effective in improving feeding practices, even in environments where the availability or adequacy of complementary foods is limited. The key messages should be easily

understood. The message should be communicated in such a way that optimizes the probability of being remembered and implemented. Thus the counseling skills also need attention (Lutter 2003 and Daelmans and Saadeh 2003).

In Indonesia the Manoff group (1991) carried out a project to improve feeding practices for children less than 2 years of age. Based on formative research, a set of educational messages on breastfeeding and complementary feeding was formulated and disseminated by local health volunteers, other health personnel, midwives and local community leaders. After one year of intervention, more mothers in the project areas reported that they had been counseled by local health volunteers as compared to those in control area. The mother's knowledge and practices of appropriate feeding behaviours was also significantly higher in the project areas especially feeding of colostrum, proper preparation and feeding of a suggested complementary food and later introduction of adult food. There was also a significant increase in the energy intake of children from complementary foods and nutritional status (weight-for-age and height-for-age). The success of the intervention was attributed to use of multiple channels of communication and direct interpersonal communication by the health workers using detailed counseling material.

The nutrition education project of AED (1995) in four regions of Mali aimed at improving specific infant and child feeding behaviours of mothers (for e.g. exclusive breastfeeding upto 6 months, increase meal frequency, provide encouragement and use of separate bowl for feeding, healthy food choices) of children less than 3 years. The nutrition education message were also targetted to elicite father's support. The communication strategy relied on counseling and group talks by health workers, supported by training and materials to help health workers negotiate changes in individual practices. Radio extended the reach of the program and motivated communication agents. The impact evaluation revealed that mothers in program villages reported better child feeding practices, such as introducing porridge, fruit, green leafy vegetables, cow's milk, and meat or liver into a child's diet in a reasonable time; using separate bowl and more purposeful feeding than mothers in comparison

villages. The prevalence of acute malnutrition among children under 3 years of age (weight-for age <-2SD) was reduced from 38 % to 28% in program villages, while it remained virtually unchanged (1 % increase) in comparison villages.

In Vietnam, during 1993-1995, nutritional rehabilitation and improvement of children under three years was carried out by 'Save the Children' in four different provinces. Under the program, local health volunteers involved identified 'positive deviants' (mothers with well-nourished children despite living in poverty) and observed their feeding behaviours and based on their practices, the health volunteers actively involved mothers of malnourished children for their nutritional rehabilitation (by providing sufficient nutritious food) over a period of two weeks. The intervention also consisted of 12 day sessions in various homes where the health volunteers imparted behavioural messages and cooking demonstrations related to Care as well as improving dietary quality without increasing household expenditures to mothers of the malnourished children. The pre-post analysis found that malnutrition among children under 3 years decreased by 40%. Even after 3 years of intervention, significantly more mothers in experimental region practiced some of the positive Care beahviours (appropriate meal frequency, feeding snacks to child and hand washing) as compared to those in control (Sternin et al 1997).

Caulfield et al (1999) reviewed effectiveness of nutrition education interventions to improve dietary intake and growth in 6-12 months old infants in developing countries. In general it was seen that there were large shifts in maternal knowledge regarding optimal feeding in first year of life. Also the efficacy trials were able to improve infant dietary intakes by 65-302 kcal/day and infant growth by 0.04-0.46 SD. The successful interventions were based on behavioural messages and the concept that food and nutrition are related to child's development.

In a slum of Delhi, Sethi et al (2003) carried out a nutrition education intervention to improve infant feeding awareness and practices of 35 mothers with infants 5-19 months. Based on formative research, individual counseling, participatory learning

methods and positive deviance approach, aided with education communication materials (posters, flashcards and growth chart) were used to impart nutrition education for two months. Post nutrition education results revealed improved awareness among mothers about infant feeding. There was an increase in variety, quantity and consistency of complementary foods fed and active feeding behaviours (6.6% pre vs. 66.6% post). The nutritional status of the children also showed improvement. It was suggested that nutrition education programs of shorter duration with a 'communication mix' of channels and repeated reinforcement could improve not only awareness but also infant feeding practices.

Community Based Interventions for Improving Care and Feeding Behaviours

The 7th plenary meeting on 'infant and young child nutrition' at the fifty-fourth world health assembly (May 2001) endorsed the importance of community based interventions in improving Care and child feeding behaviours. It urged member states to develop, implement or strengthen sustainable measures aimed at reducing all forms of malnutrition in young children through a combination of strategies that include supplementation, food fortification and diet diversification, including promotion of recommended feeding practices that are culture-specific and based on local foods as well as through community-based approaches (BPNI 2001).

According to the Global Strategy on IYCF, mothers, fathers and other Caregivers should have access to objective, consistent and complete information about appropriate feeding practices, free from commercial influence. It further states that mothers should have access to skilled support to help them initiate and sustain appropriate feeding practices, to prevent difficulties and overcome them when they occur (WHO 2003 a).

Community workers are respected members of the community, most often volunteers. They are the 'strategic allies' for outside catalytic support for community change

(Jonsson 1997). Building their capacity should therefore be an essential element of efforts to improve infant and young child feeding and Care.

Capacity Building of Community Workers

Training or capacity building is the process of teaching, informing, or even educating the learners to enable them to do their work better and/or able to perform in a higher position. The aim of training is to develop new knowledge, skill or expertise. Training is more than just learning. Training should have a goal of improved performance at some specified task (John 1992).

Capacity building should also aim at addressing not only the immediate causes but also the underlying causes of malnutrition. Examples include good feeding practices including exclusive breastfeeding and mixed feeding, protection against disease, immunization, how to use home foods and fluids for diarrhoea; and home hygiene – sanitation to prevent diarrhoea and intestinal parasitic infections (Latham 1995).

Capacity building is required since the community groups might not have any nutrition or communication skills or they may be inadequate. Experience has shown that even if a community group is engaged in nutrition and health partnerships, capacity needs to be built gradually by starting with only a few activities at a time (WHO/ Basics/UNICEF 1999).

In a subcentre area of South 24-Parganas district of West Bengal, capacity building training was provided to 34 community influencers (volunteers from the villages) related to infant feeding practices (new born feeding and breastfeeding, complementary feeding and care during illness) through lecture, group discussions, question-answer session and hand-on-training by trained health workers. Method of community involvement through meetings with mothers and home visits was also included. The mean score of knowledge of influencers during pre training assessment increased from 13.3 to 25.2 at final assessment after 6 months. Reinforcement training (carried out at frequent intervals within a period of 3 months) was useful. The authors

concluded that capacity building training and its reinforcement was a useful strategy for generating human resources on health care from within the community (Haldar et al 2001).

Adopting Individual Counseling and Mobilizing Community Groups is effective for behaviour change. Home visits, group meetings, growth monitoring sessions and cooking sessions are all good opportunities for sharing information and for individual counseling (WHO 2003 b).

Within the community groups, there are several mechanisms for increasing community-level support of exclusive breastfeeding and continued breastfeeding with complementary foods for children up to two years. Such strategies as suggested by UNICEF (2003) include Lay/peer counselors (volunteer or paid), Village support groups and Women's groups.

Lay/Peer Counseling

There is strong evidence base for lay/peer counseling. These counselors are not health care professionals; they are community members trained to counsel mothers in appropriate infant and child feeding practices. Their supervision may be delegated to local committees, NGOs, or local health units. Examples can be drawn from evaluations of lay counselor programmes in Mexico and Guatemala (Morrow et al 1999). The data revealed that mothers who had support from community-based peer counselors were able to exclusively breastfeed infants longer than control group mothers. Another randomized controlled trial of community based breastfeeding counseling by peer counselors, in Bangladesh, also achieved measured improvements in breastfeeding practices (Haider et al 2000).

Village Support Groups

The Baby-friendly Community Initiative in the Gambia is an example of a community based strategy to improve IYCF that is built around village support groups trained in infant feeding. The aim is to create an environment where nutrition becomes

"everyone's business". The Gambia programme is based on the 10 steps to successful infant feeding and involves everyone in the community – men, women and children. In fact, they found the support of men is crucial to sustainability. Both men and women received the same knowledge about the nutritional needs of the mother and baby and could advise and encourage women and their partners in improved infant feeding practices. In addition, the village support groups taught mothers and caretakers the connection between maternal and infant nutrition and a clean environment and adequate personal hygiene. An evaluation took place 12 months after the initiation of the intervention in 12 pilot communities in the Gambia and found that 100% of mothers were initiating breastfeeding within 24 hours of delivery, in contrast to the 60% at baseline (Jallow 1998).

A community-based pilot nutrition education intervention) was undertaken in four rural townships (one township comprised of 12 villages), in China (n =250 infants each in two Education and two Control groups (Guldan et al 2000). The goal of the year-long intervention was to improve infant growth by improving infant feeding practices through growth monitoring and individual counseling. Local village nutrition educators (one from each village) were trained (3 session throughout the year) and mobilized to make monthly growth monitoring and age appropriate complementary feeding counseling visits to all pregnant women, and families with infants born during the intervention in the study villages. The village educators were also trained in good two-way communication skills for educating household members. An infant feeding guide book and growth chart were used in the counseling visits.

Results: After one year, a majority (64%) women stated these visits were helpful and the Education group (E) mothers showed significantly higher nutrition knowledge and better infant feeding practices than their Control (C) group counterparts. For example: giving fruits and eggs, daily rice porridge, fish/meat broth after 6 months. E mothers reported to feed their infants (7–9 months) significantly more times than the C mothers (1.6 ± 1.3 times vs. 1.3 ± 1.1 times). Hygiene practices also reportedly improved in E group. The E group infants were significantly heavier and longer, at 12 months, had higher breast-feeding rates overall (83% vs.75%) and lower anemia rates (22% vs.

32%) than the C group infants. **Strong points of the intervention were**: clear goal (improvement in growth) and focus (improved feeding practices related to higher energy intake and increased amount of food intake during after 6 months), stress on individual behaviour change rather than dissemination of information and low cost (home based complementary foods). It was recommended that the training and incentives for the village nutrition educators should be strengthened to include more emphasis on counseling techniques, as well as stronger supervision of their work.

In rural Bangladesh, a community-based weaning intervention used volunteers to teach complementary feeding to families of 62 breastfed infants aged 6-12 months (Brown et al 1992). The preliminary messages were developed by the village level workers and technical staff and included in-home demonstrations of snack-type recipes and instructions for enriching meals with energy, protein and other nutrients by adding oil, molasses, milk, fish and lentil flour to foods or by offering vegetables or seasonal fruits. The messages also encouraged continued breast-feeding in addition to frequent and persistent feeding of new foods, proper food storage and the need to wash hands and utensils adequately before cooking and feeding. The approach to teaching was family oriented, involving the other family members like father and grandmother. **Results:** Over 5 months, treatment children consumed more fish, oil and vegetables and a significantly greater percentage of their energy and protein requirements from complementary foods than did control subjects. Treatment children gained on average 0.45 SD (approx. 460 g) more in weight-for-age (WAZ) than the 55 control subjects, and were approx. 0.5 kg heavier at the final measure. The differences were statistically significant ($p<0.001$). The percent median weight-for-age (WAPM) of treatment children held steady at 76% of the National Centre for Health Statistics' reference, whereas the WAPM of control subjects dropped from 78% to 72%. Severe malnutrition (WAZ<-3SD) increased by only 5% in the treatment group compared to 26% rise in the control subjects. **The findings concluded** that improvement in infant feeding practices and resulting improved growth is possible if appropriate messages are marked through appropriate channels. The authors also suggested that, incorporating the nutrition messages into other development programs like infection

prevention and control or income generating programs may enhance the potential impact of the education.

Another intervention study was conducted under the Bangladesh Integrated Nutrition Project (BINP) in rural Bangladesh, among 282 moderately malnourished children (6-24 months) who were divided into two intervention and a control group (Roy et al 2005). Mothers of the first intervention group received intensive nutrition education (INE group) from the community nutrition promoters, twice a week for three months. The second intervention group received the same nutrition education, and their children received additional supplementary feeding (INE+SF group). The intensive nutrition education, designed on the basis of food security, caring practices, and disease control was delivered to groups of 10-12 mothers, using posters and leaflets. The comparison group received nutrition education twice a month according to the standard routine service of BINP. **Results:** The practices and awareness regarding infant feeding and health (use of separate feed pots, increased frequency of feeding, cooking of additional complementary foods and ability to identify malnutrition) improved significantly in both the intervention groups after three months of interventions and six months of observation. After the intervention, a significantly higher proportion of children in the INE and INE+SF groups improved (37% and 47% respectively) from moderate to mild or normal nutrition compared to the comparison group (18%) and their nutritional status improved further at the end of six months of observation. It was concluded that intensive nutrition education with 'specific knowledge' messages, explaining the functions of dietary ingredients and their role in child growth and risks of malnutrition, significantly improved the nutritional status of children with or without supplementary feeding.

Hotz and Gibson (2005) implemented a participatory nutrition education intervention in 3 intervention villages of Malawi, central Africa and all the mothers with children 6-23 months were enrolled. Another village served as control. Experienced and trained field staff members trained community health committee members and local health surveillance agents to deliver four group education lessons per village over a period of

8 weeks. The education lessons related age appropriate quantity of complementary feeding, increasing nutrient density of complementary foods, encouraging children to eat and demonstration of preparation of energy and nutrient dense porridges. **Results:** Through nutrition education, participating mothers were able to use existing food resources to improve complementary feeding practices and this was associated with enhanced adequacy of energy and several micronutrients in the complementary diets.

Similarly, in Haryana, a large community based study also confirmed that Care and feeding practices can be improved if information and support are given to families and Caregivers through various channels within the health system and community. The study evaluated the effect of interventions to improve exclusive breastfeeding during the first six months and complementary feeding practices thereafter and the impact on infant diarrhoeal diseases and growth. In the intervention communities, the opportunities used for counseling were: monthly home visits for children up to 12 months, weighing once every 3 months for children below 2 years. conducted by Anganwadi workers, immunization clinics run by the auxiliary nurse midwives, and sick child contacts with health care providers, monthly neighbourhood meetings by the community representatives with caretakers of children below 2 years and women's groups meetings. The key findings of this study were that exclusive breastfeeding rates were high (at 3 months) while the 7-day diarrhoea prevalence (at 3 and 6 months) was lower in the intervention as compared to the control communities. The complementary feeding practices (meal frequencies, energy intake and active feeding) also improved substantially in the intervention group. Further, intervention group children had significantly higher lengths at 12 months of age but there was no impact on weight (Bhandari et al 2003 and Bhandari et al 2004).

In another successful community mobilization, in addition to functionaries from the health and Panchayat Raj Institution, community mobilizers i.e. socially active women (n=831) in two rural blocks of Agra were trained on issues related to maternal and child health nutrition. These women promoted behavioural changes at community level and created demand and utilization for health and nutrition services through

counseling. These women were followed up initially every month and then after every 3 months for reviewing their activities and problem solving. Assessment after 3 years revealed that this initiative could bring about an improvement in child feeding practices and nutritional status. One of the reasons for easy acceptability of the messages was that they were disseminated from a member of the community who was respected and accepted by the community (Nandan 2004).

Kilaru et al (2005) evaluated a nutrition education intervention using monthly nutrition education delivered by locally trained counselors targeted at Caregivers of infants aged 5-11 months (n=173 intervention, 69 control) in rural Karnataka. The mothers were counseled to improve the quality and quantity of the child's diet through questions and probes asked in a friendly manner, including personal examples from the counselor regarding the ways of overcome challenges in feeding young children. **Results:** Impact evaluation revealed that intervention infants had a higher mean daily feeding frequency, higher dietary diversity, and were more likely to be fed foods suggested by the counselors such as bananas compared to non-intervention infants. Statistically significant improvement was found in weight velocity for female infants in the intervention group and they were also more likely to exhibit at least four positive feeding behaviours. It was suggested that, community based nutrition programs that emphasize appropriate feeding and Care behaviour can be used to prevent and address early childhood malnutrition in poor households.

Women's Groups as Change Agents

Women's groups including micro enterprise programmes can make excellent partners for nutrition interventions (WHO/Basics/UNICEF 1999). There is evidence that women's support groups can be remarkably self-sustaining on a volunteer basis with minimal resources. The main factors that appear to be key to the success of mother support groups are (a) high personal motivation of the various participants, (b) strong support structure, and (c) good coordination with local health facilities and authorities.

There are several models of women's support groups, such as the Breastfeeding Support Group where mothers interested in breastfeeding meet together and the Mother's Support Group, which has a broader purpose.

An example of this is La Leche League's Mother-to-Mother Support Project in the peri-urban areas of Guatemala City that involves trained volunteer breastfeeding counselors who provide home visits and one-on-one breastfeeding counseling to other women in the area, refer them and their children to health clinics, and organize mother support groups. LLLG staff train, supervise and support the volunteers, in addition to establishing mother support programmes in the low-income communities (Burkhalter and Bashir 1998). Research is limited but survey data suggests that participants in women's support groups have better breastfeeding outcomes.

Mother -to- mother support groups affiliated with the Ghana Health Service's Baby-Friendly Hospital Initiative (BFHI) are committed to improving infant and young child feeding practices and maintaining formal links between health institutions and communities. The mothers' group model promoted by World Vision empowers women to help themselves and their families lead fuller, more productive lives through peer education on topics such as home hygiene, family planning, breastfeeding, malaria, and HIV/AIDs (Linkages and partners 2003).

Only a few interventions are reported in literature that involve women's groups including women members of savings groups/micro credit to act as change agents to improve maternal and child nutrition.

In the Linkages (2002, 2006) program of Madagascar, members of women's social, religious, and income generating groups (n=4300 women in 2 provinces) were trained as "nutrition volunteers" to promote breastfeeding within the context of 7 "essential nutrition actions": optimal breastfeeding, adequate complementary feeding beginning at 6 months with continued breastfeeding, feeding of the sick child, improved women's nutrition, and the control of vitamin A deficiency, anemia, and iodine

deficiency. These women with the use of IEC materials, conducted educational activities during home visits, at community health centers; promoted improved behaviours at group discussions and during informal contacts with mothers. They also participated in national or community sponsored health and nutrition events. Evaluation of the program revealed that the community based volunteers were successful in reinforcing nutrition messages locally; became a local neighbourhood resource for health and nutrition information, and many employed innovative strategies to better promote nutrition messages. As a result infant feeding behaviours improved with regard to: timely initiation of breastfeeding (from 34% to 78%), exclusive breastfeeding (from 46% to 68%), complementary feeding at 6 months, increased dietary diversity and washing child's hands before feeding. However, feeding frequency, especially in infants older than 12 months remained low and the use of soap for hand washing was much lower. Strong point of the intervention were focused messages, cost effectiveness as it advised home based complementary foods and continued supervision, Training of large numbers of community members was advantageous as it could replace losses that occur with staff transfers and dropouts, particularly in the public sector. Further, using existing groups in communities instead of creating new ones allowed for quicker start up and fostered sustainability.

In Senegal, existing women's groups were invited to develop partnerships with health centers in the district to carry out monthly weighing and nutrition education activities run by their own members at the neighbourhood level. The problem was lack of access to health facilities and limited outreach by clinic staff to carry out essential nutrition actions. Training sessions were used to transfer knowledge on infant feeding and counseling skills to community-based volunteers. The use of women's groups resulted in greater community involvement and ownership of nutrition activities. Coverage increased significantly (WHO/Basics/UNICEF 1999).

In rural Nepal women's groups (n=111), facilitated by local women have been utilized in a randomized contrail trial to reduce perinatal and neonatal mortality rates. These groups developed varied strategies including Nutrition Education Communication to

tackle problems of maternal and newborn care: establishing mother and child health funds, producing clean home delivery kits and operating stretcher schemes. These groups also served as a medium for links between health service providers and the users (pregnant women). The impact of the women's group intervention was evaluated in a cluster randomized controlled trial which showed a 30% reduction in neonatal mortality rates and a reduction in maternal mortality rates in the first 30 months of the trial (Morrison et al 2005).

As regards India, not many experiences appear to be reported regarding strategies that have utilized the potential of women's groups including women members of savings groups/micro credit groups. Little is known about their effectiveness as change agents to improve household level Care practices, in particular breast feeding (BF) and complementary feeding (CF) and hygiene.

In Karnataka a community intervention for reduction of maternal anemia hypothesized that decentralized distribution of iron supplements with community health volunteers (CHVs) and community participation would decrease the prevalence of anemia (Stephens 2000). A total of 145 women (94 rural; 51 urban) many of whom were traditional birth attendants (TBA) were designated as CHVs and trained as regards communicating with pregnant women and their families regarding anemia and iron supplementation and to motivate women towards better compliance. These CHvs were also responsible for distribution of iron supplements in the community. IFA was obtained from Government Primary Health Centre. An evaluation of the trial after 7 months revealed better distribution and reported improved compliance. IEC intervention strategies resulted in increased amount of iron tablets being requested by pregnant women from health care providers in both the private and government sectors. The TBAs who were interviewed knew the protocols for anemia reduction and management of side effects and had the confidence of their villages. The prevalence of anemia among pregnant women (n=210) also reduced from 67% to 59%.

In North India, World Vision (international voluntary organization) conducted community outreach for improved infant feeding, involving not only government health workers and village leaders but also women's groups i.e. *'mahila mandals'*. The trained *mahila mandals* counseled families and reinforced infant feeding messages at least once a month and also conducted healthy baby contests. The training of *mahila mandals* was reinforced and their activities were monitored by reviewing the registers monthly. In World Vision's Area Development Programme (ADP) in Jagriti, Dehradun District, Uttaranchal, the proportion of mothers who initiated breastfeeding as advocated, rose from less than 1% in 1999 to 22% in 2001. Data collected by partners on other indicators also clearly showed the impact of the collaborative behaviour change interventions for improved infant, child, and maternal nutrition (AED/LINKAGES 2004).

Rationale for the Present Study

The above review highlights the importance of optimal child feeding and Caregiving behaviours for optimal development and nutritional status of the child. Unfortunately research is inadequate in the important area of Caregiving in this region, especially the various dimensions of infant feeding, hygiene and Caregiving behaviours including how resources available for Care influence Caregiving.

Also there is inadequate knowledge regarding how Care and feeding practices for young children at the community level can be improved using local community groups or volunteers. There is scanty literature available on mobilization of local women's groups (including savings groups) for improving house hold level child feeding and Care practices.

Finally, the 'how to' of Nutrition Education and Communication, (i.e. how best can local women's groups be trained in messages and communication skills) needs further study.

In view of the above, the present intervention study in rural Vadodara studied Care practices and resources available for Care in relation to breastfeeding and complementary feeding practices in children below 2 years. Further, it also built capacity of local community groups i.e. *Bachat Mandals* or savings groups, which are run by the local Non Governmental Organization (NGO) to improve IYCF practices in rural Vadodara.