Chapter – II

REVIEW OF LITERATURE

“Infant feeding practices are the longest, uncontrolled experiments, lacking informed consent in the history of medicine”.

- Frank Osk71

The literature related to the study was organized under the following headings.

1. Anatomy and Physiology of Lactation.
2. Composition of Breastmilk
3. Mother Infant behaviour at the Moment of Birth
5. Prevalence of Breastfeeding.
6. Efficacy of Education on breastfeeding
7. Efforts taken by the Government and other Organisations to promote Breastfeeding.

ANATOMY & PHYSIOLOGY OF LACTATION

A woman is privileged among the Homo sapiens. She, unlike man can conceive. After conception, the baby grows in her womb for nine months. Following childbirth, the mother has unique power of
nurturing her young one. This tiny tot can sustain life and grow well in the most scientific and advanced way for 6 months on his mother’s milk alone.

The human breasts are highly specialized secretory organs. The shape and size of the breast varies from woman to woman just as the body structure and facial characteristics. Commonly breast, dome shaped is located horizontally from the parasternal line medially to mid axillary line laterally. Each breast usually measures 10-12 cm in diameter. Size of the breast has no relation with milk production.9

**Structure**

The skin of the breast includes the nipple, the surrounding areola and the general skin. The skin is flexible and elastic cover of the breast contains hair, sebaceous glands, Montgomery tubercles, apocrine and sweat glands. Nipple is a conic elevation located in the centre of areola. Each nipple contains 20-25 lactiferous ducts surrounded by fibro-muscular tissue. Bulk of the nipple is composed of smooth muscular tissue arranged in inner longitudinal and outer circular and radial fashion. Nipple is richly innervated by unmyelinated sensory nerve endings and nipple is also well supplied with sebaceous and apocrine sweat glands.72
The breast tissue consists of the stroma and the parenchyma having ductular-lobular-alveolar structures. Ducts with few branching ductules terminating in alveolar clusters are called as Terminal Duct Lobular Units (TDLU). The lobi which are arranged like spokes converging on the central nipple are lactiferous sinuses, 15-20 in number. Each lobus is divided again into 20 to 40 lobuli and each lobulus is subdivided into 10 to 100 alveoli forming tubulosacicular secretory units. Each alveolus is surrounded by a basket of myoepithelial cells which contract in response to oxytocin. Thus milk is pumped from alveoli through the ducts to the lacteal sinus.72

**Initiation of Milk Secretion**

Milk production is a complex but well synchronized process, controlled by variety of hormones. Two stages of lactogenesis have been described by Hartman. Stage 1, starts from 16th week of pregnancy. Some women can express fluid from breast which is called colostrum. Stage II, starts after 2-3 days postpartum and there is copious secretion of milk which involves four secretory mechanisms: Exocytosis, fat synthesis and transfer, secretion of ions and water and immunoglobulin transfer from extracellular space. After delivery of the
placenta, inhibition of milk synthesis is removed and the level of progesterone declines rapidly. The woman experiences breast-fullness and the volume of milk secreted may be adjusted to the requirements of the infant by a local factor secreted into the milk called “Feedback Inhibitor of Lactation” (FIL).  

The two maternal reflexes involved in lactation are the milk production reflex and the milk ejection reflex, which involve hormones, prolactin and oxytocin respectively. Stimulation by the infant of nerve endings in the nipple-areola complex sends impulses through afferent neural-reflex pathway to the hypothalamus. This results in the secretion of prolactin from anterior pituitary and oxytocin from posterior pituitary. Other hormones like corticosteroids, insulin, thyroid, parathyroid and growth hormones also support lactation. Prolactin stimulates milk synthesis in the acinar cells of the breasts, persist in the blood and produces milk for the next feed.  

Oxytocin contracts the myoepithelia cells, forcing the milk ooze out into the ducts for the present feed. Mothers may experience this milk ejection reflex or milk let-down as a warm and tingling sensation in the breast. Oxytocin respond to tactile, visual, olfactory and auditory stimuli and it can also be conditioned.
Infant Reflexes

Sucking reflex is stronger at birth. The normal, full-term, human infant at birth is equipped to breastfeed successfully. In the early minutes of birth, sucking reflex is stronger and the infant is more alert, suckling stimulates oxytocin and prolactin as mother’s sensitivity to tactile stimulus at the aerola and nipple is also stronger at this time. In the first hours after birth, the newborn can crawl from the mother’s abdomen to her breast to have a co-ordinated hand and mouth activity and searching actively for the nipple while the mouth gapes widely and finally attaching itself well to the breast and feeding vigorously before falling asleep, all these activities happen in 120-150 minutes after delivery. 73

Rooting reflex programmes urge the infant to search for the nipple while mouth gaping widely enough to take a good mouthful of breast tissue. Sucking reflex is triggered when something touches the palate. Swallowing reflex occurs when the infant's mouth fills with milk after 2-3 sucks. Proper positioning, attachment, effective suckling, efficient milk transfer ensure adequate milk intake. 27

COMPOSITION OF BREASTMILK

Human milk is a highly complex, dynamic, living, biological fluid when compared to animal milk or expensive formula,
composition of which cannot match mother’s milk in suitability for the infant which is in inert or fixed composition. The composition varies among and within women, changes over a period of time, during different times of the day, indeed during the course of a single feed.

Human milk is species specific, age specific and baby age specific, as it is tailored to the needs and demands of the baby. Much of future-structure and function of an individual depends upon his genetic ‘imprint’, same way events in early life, influence events in later life. Breastfeeding and hormonal signals provide physiological programming and now it is a well known fact that breastfeeding is more than just ingestion of milk.

Infant’s need of energy, protein, calcium and phosphorous is greater than an adult’s need based on per kg body weight. The energy need in the first month of life, is 5 calories per gram of tissue gained and the percentage of total energy intake used for growth is 305 Kcal’s which is ideally met by breastmilk.

Human milk furnishes an array of nutritional, anti-infective, and non-nutritional factors. More details are deciphered about specific, macro, micro nutrients in breastmilk. As breastmilk is precisely
engineered for the human infant, so the clinicians should not have to justify the recommendation of breastmilk, instead should have to justify its replacement with a substitute.\textsuperscript{74}

\textit{“We need to help parents make wise choice”}
- William Sears, M.D.\textsuperscript{77}

Mother’s milk responds to various infectious agents in the environment and produces antibodies (Entero Mammary Circulation) and gives protection from the onslaught of fresh epidemics (Bhavani Belevady, 1999)\textsuperscript{78}. Modulation of immune response to vaccine antigen or infectious agent, by specific components of human milk is of potential benefit to breastfed infants. There are around 100 compounds in breastmilk which are not found in formula milk. E.g. long-chain poly-unsaturated fatty acids (LCPUFA).\textsuperscript{79,80}

There are three distinct stages of human lactation, namely colostrum; the initial milk with a lemony yellow colour,\textsuperscript{81} secreted in the first 2-3 days of delivery and transitional milk; secretion of which starts from 3 days after birth and continues for 2-3 weeks; and then the mature milk is secreted.\textsuperscript{81} The milk secreted for the first 2-3 minutes of a feed is called foremilk which is rich in lactose and satisfies the thirst of the infant. The milk secreted after 2-3 minutes of the feed is called the hind milk and this is rich in fat which satisfies the infant’s hunger.\textsuperscript{9}
COMPOSITION OF COLOSTRUM

Colostrum works as the first defence against infections, by providing 30-80 times higher concentration of white cells, antibodies, lysozymes, anti-oxidants, immune and immuno modulating factors which act as casomorphins. It gives protection, against polio, mumps, influenza, vaccinia, Japanese B encephalitis virus. Hence it is called the first immunization. Utilization of colostrum during infancy is an important determinant of infant mortality. Apart from these benefits colostrum provides energy to the extent of 67 kcal/100ml and Vitamin A is 3 times higher than mature milk which reduces that incidence, severity of any infections and also add on to the stores.

Colostrum contains 2.3gm/dl proteins whereas in mature milk it is 0.9gm/dl. The whey protein casein ratio is 90:10 in colostrum hence it is easily digestible. Growth factors present in colostrum helps the baby’s immature intestines to develop and also prevents allergies.

COMPOSITION OF MATURE MILK

Nutrients in mature milk are perfect for the baby in both quantity and qualitywise. Water is the largest constituent (88%) in mature milk. It has low solute load to suit the infants immature
It is a well established fact that an exclusively breastfed infant does not need water during the first six months of life even during hot and humid climates.\textsuperscript{83}

**Proteins**

Proteins in breastmilk provides amino acids in perfect ratio, (high cysteine, low methionine, tyrosine and phenylalanine) for growth and the anti infective factors and anti microbial factors help to protect the child from infections. Whey protein and casein ratio is 60:40, in contrast to bovine milk which has 20:80 whey and casein ratio, which forms hard, thick, non-soluble curd, difficult to digest and assimilate.\textsuperscript{76} High $\alpha$ casein in bovine milk has a negative effect on the bio-availability of iron and zinc. In breastmilk $\beta$ casein is the major fraction and $K$ casein helps in the growth of lactobacillus bifidus.\textsuperscript{9,84}

Lactoferrin is an iron binding glycoprotein and survives digestion by proteolytic enzymes. It plays an important role in iron absorption and also withholds iron from iron requiring bacteria and protects tissues from pro-oxidant effects of iron.\textsuperscript{84} The following essential amino acids are found in breastmilk: Histidine, Isoleucine, leucine, lycine, methionine, phenylalanine, threonine, tryptophan,
valine and also non-essential amino acids. Breastmilk also provides protective factors SlgA, SC, IgM, IgG, serum albumin, lysozymes, pro-activators C3, C4, enzymes like lipoprotein lipase, α-amyrase, galactosyl transferase, lacto peroxidase, α-anti trypsin, α1-anti chymotrypsin, sulf hydryl oxidase, which act as binding proteins for some hormones and vitamins.

Taurine is a free amnio acid, a neuro transmitter and a neuro modulator found in nervous tissues and retina. It helps in maturation of auditory brain stem to evoke responses. The level of Taurine content is low in animal milk. 80,85

**Fat**

The average lipid content ranges from 3.2 – 3.8gm/dl. Fat provides 50% of the total energy. Fat content in hind milk is double that of foremilk and fat content is higher in afternoon and evening feeds. BSSL (Bile Salt Stimulated Lipase) improves digestibility of milk fat and absorption of calcium. 86 LCPUFA in breastmilk are important for early human growth and development. The endogenous synthesis of LCPUFA from precursors is limited in infants. Bovine and formulae milk are devoid of LCPUFA and the infants who fed on them would
develop depletion, resulting in low visual acuity and decreased brain growth. 87

Omega 6 fatty acids like linoleic acid (LL), arachidonic acid (AA), eicosadienoic acid, di-homo gamma linolenic acid and omega 3 poly unsaturated fatty acids like \( \alpha \)-linolenic acid, eicosadienoic acid, docosapentaenoic acid and docosahexanoic acid are not synthesized by infants, therefore breastmilk is essential for infants. Japanese women have highest levels of DHA in their breastmilk. Free fatty acids like lauric acid and linoleic acid are released during lipolysis and inactivate enveloped viruses, bacteriae, fungi, protozoa, etc. 9

**Carbohydrates**

Lactose is the principal carbohydrate in human milk and meets 50% of infants energy. It promotes growth of normal gastro-intestinal flora. Glucose, Fucosylated and other oligosaccharides, glycoproteins, glycolipids and nucleotide sugars promote the growth of several species of bifido bacteriae. More than 100 oligosaccharides have been identified in human milk. Bovine milk has only traces of these. 78

**Micronutrients**

The minerals and their salts ensure optimum growth of human babies. Calcium, phosphorous ratio is ideal i.e. 2:1. Though iron and
zinc content is low in breastmilk, deficiency does not occur because of high bio-availability. Breastmilk is a modest source of vitamin A, and Vitamins, E, C, D, K, B Complex. Feeding cow milk and formula milk can increase risk of hypernatremia, dehydration due to PRSL (Potential Renal Solute Load).

**Non-nutritional factors in breastmilk**

At least 70 enzymes have been identified in breastmilk. Lactoperoxidase and sulph hydroxylase have anti-infective properties and the alpha amylase help in digestion. Nucleotides, in breastmilk, function as precursors for nucleic acid synthesis, act as co-enzymes and it is found absent in bovine milk. Apart from epidermal growth factor, the other growth modulators promoting maturation of the intestine are nerve growth factor, somatomedin C, insulin, insulin like growth factor, thyroxine, cortisol, taurine, glutamine, amino sugars, interleukin – 1, 3, 4, 5, 6, 8, 10, 12 and gamma interferon, tumour necrosis factor, β, transforming growth factor, etc.

**Non-specific immune factors in breastmilk**

The following factors provide immunity against infections viz. motilin, lactoferrin, FFA, cytokines, imminoglobulins, somatostatins,
probiotics for lactobacilli, vasoactive and gastro inhibitory peptides neurotensins, IgA, IgG, WBCs cathepsin and antibodies.\textsuperscript{84}

**Hormones in Breastmilk**

Hormones appear to modulate growth and maturation and effect appetite and digestion. Almost all hormones are found in breastmilk. Prolactin, growth hormone, growth hormone releasing hormone, thyroid stimulating hormone, thyroid releasing hormone, luetinizing hormone releasing hormone, gonadotrophin releasing hormone, paratharmone, estrogen, progesterone, erythropoietin, melatonin, leptin, etc, are present in breastmilk.\textsuperscript{88}

**MOTHER INFANT BEHAVIOUR DURING THE MOMENT OF BIRTH**

Infant sucking has the potential to provide an excellent index of neuro-behavioural development, since sucking begins as early as 13 weeks in uterus and undergoes changes within the first day of life. Sucking reflex is an inborn activity and a conditional reflex dependent primarily on physiological maturation and is capable of being strengthened in accordance with learning experience and it is an important aid to the newly delivered mothers.\textsuperscript{89}
The concept of IV stage of labour was developed in 1970's. The time immediately after delivery is optimal for bonding which is the initial attraction and desire to get to know another person. This strong human bonding paves way for the development of love and affection and also leads to a long-term, exclusive and successful breastfeeding.

Peak concentration of oxytocin is recorded within 15 minutes of expulsion of placenta with several peaks coming up to one hour after delivery. Oxytocin induces feelings of increased love for infants. So, it is important to put the child to the breast within half to one hour, if not the bonding may not get firmly established at a later time.

After delivery of the baby, the mother becomes exhilarated, talkative, despite the length or intensity of labour and delivery. She reaches out physically and emotionally for her infant. Her reaction is of elation tempered with the new responsibility of a mother and a sense of accomplishment of motherhood. The new mother is curious and eager to have a closer look at her newborn with an urge to breastfeed.

Nurses can facilitate this transition by providing contact during this sensitive period. If mothers are not given the opportunity they
may experience strong sense of deprivation and loss. Most of the women make requests to breastfeed the baby immediately after delivery. Snatching away the baby on some medical grounds at this time is unfortunate for it shuts the window for the opportunity.27

Every effort must be made to permit the mother to see and touch her baby as soon as possible after birth, especially in the early minutes of birth. Routine transitioning procedures can be deferred until after the first feed.92 Major deficits in mental and motor development may occur if the mother and the baby are separated for long. Late initiation leads to unwanted supplementation practices.93

Pleasant thoughts, sensations, sound or sight of the baby, love for the baby, and the confidence in the mother help to produce more milk instantaneously. On the other hand the stress caused by psychological states, lack of confidence, anxiety, worry, and pain reduces blood flow to the breast decreasing breastmilk production and also the flow of milk.94

Infact stress interferes with lactation performance. A study in Japan revealed that the mothers in the control group who did verbal,
difficult calculations and exposed to noise showed delayed response to sucking so did the number of release pulses.\textsuperscript{94}

Confidence can be built up by providing knowledge. Knowledge dispels fear, anxiety, and stimulates hypothalamus to secrete oxytocin from the posterior pituitary leading to the ejection of breastmilk.\textsuperscript{27}

Within minutes of birth, the infant identifies and follows more of a face like pattern than other patterns of similar brightness. There is a greater response to the proper picture of a face than to a scrambled one, indicating that the organized visual perception is an unlearned capacity and within 9 minutes they turn towards moving stimuli.\textsuperscript{94} It is really a fascinating experience to see the young baby communicating with its mother by rooting, by watching her, crying, clinging to her.\textsuperscript{95} Rooting reflex enables him to find the nipple without his being directed to it. The infant turns to recognize the mother’s milk, smell it, taste it, and by altered sucking patterns it shows the difference between breastmilk and formula milk.\textsuperscript{94}

The process of parental attachment begins in the pre-natal period. Bonding in between the mother and the baby (Reva Rubin)
occurs throughout pregnancy and 6 months after birth. Breastfeeding is not instinctive with humans as with animal species. Immediately after delivery the infant is usually alert with open eyes and appears to be interested in the environment (Klaus & Kenell). Most of the mothers touch their infants in a progressive pattern that begin with placing fingertips against infants extremities, then to proceed to palm to massage, stroke and encompass the trunk. Actual eye to eye contact was recorded with 70 mothers of which many assumed an enface position. Mother-infant eyes meet fully in the same vertical plane of rotation. She speaks loudly to the infant moments after birth and the infant is more attentive to human voices.95

The process of infant feeding is a complex one and the relationship involving the acquisition of nutrients by the infant, and the interaction between infant and mother is more important. Freud’s secondary drive theory (1940) was based on the hypothesis that infant-adult relationship has its roots in the infant’s need for food by the caregiver. Harlow redefined in late 1950’s the infant, food, caregiver and their relationship. In 1970’s Bowlby theorized that infant behaviour is adapted to the caregiver’s behavior. He postulated that in order to survive, the infant develop behaviors that effectively elicit and
maintain maternal proximity like crying, sucking, making eye contact, etc. ⁹⁶

On Bayley scales, early infant feeding and interaction is positively associated with attachment, cognitive, social and emotional development. Holding close and other subtle interaction behaviours like touching, humming and endearing sounds necessitated by the art of breastfeeding are responsible for the improved developmental scores. ⁹⁷

**FACTORS AFFECTING BREASTFEEDING**

Breastfeeding is a behaviour that is influenced by many complex factors and confounders. Various social and psychological factors may then be missed in studies trying to promote breastfeeding. ⁹⁸ An indepth understanding of specific factors that affect a woman’s decision to breastfeed will have far reaching implications for future educational and interventional programmes. Until we understand what motivates a woman to breastfeed, further progress will not occur and most of the factors are subject to modification by education and counseling. Identification of the risk factors should assist targeted women who are at heightened risk of not breastfeeding exclusively. ⁹⁹
Age

Many study findings revealed that there is a strong association between age and breastfeeding. All mothers who are old tend to breastfeed more and the younger mothers do not consider breastfeeding an important one. 100

In Egypt, breastfeeding is reported to be associated with responsibility and maturity of a woman, and very young mothers are not expected to breastfeed. 9

Education

There seems to be a positive association between education and breastfeeding.101

Among the educated mothers exclusive breastfeeding rate decreased to 22% after 3 months and it further decreased to less than 9% by 6 months.102 Some studies reveal controversial findings.

Customs and Beliefs

Customs and beliefs imposed by cultures, have strong influence on infant feeding practices. Beliefs may influence breastfeeding patterns enormously (e.g. after walking outside milk is hot and must be eliminated).9
The belief that grandmothers or sister-in-law should give the first feed, delays initiation of breastfeeding. There is a ritual usually followed in Delhi urban slums, in which the sister-in-law cleans the mother’s breast after a particular star was sighted, then only breastfeeding gets started.9

Study conducted at Baltimore, USA on primary female care givers (n=102) revealed that 44% of infants were given solids at <4 months of age with the belief that child sleeps better with solids.103

Giovanini (2004) have reported that a mother’s perception that her infant was small, increased the likelihood of her not breastfeeding.104

Race

A study on 1247 mothers living in Pacific Islands (New-Zealand) showed low breastfeeding rates.105 Infants born in Asia and China have higher breastfeeding rates. The practice of breastfeeding among Hispanics was 75%, African-Americans was 49% and Whites was 42% and low in blacks.106
Attitude and Psychological Predisposition of Mothers

A woman chooses to breastfeed for many reasons. Recent research suggested that parental attitude as stronger predictors of breastfeeding than commonly cited socio-demographic factors.¹⁰⁷

Failure to breastfeed was triggered by psychological factors and are responsible for volatility of breastfeeding rates. Attitude, insistence, intention and psychological predisposition to breastfeed the baby are important factors, which determine or undermine breastfeeding practices. Attitude fostered by interaction with others in the modern world also affects breastfeeding.¹⁰⁸

A qualitative study by Tarrant et al (2004) on 17 Hong Kong women revealed that Hungsum (determination) was strongly associated with breastfeeding.¹⁰⁹

Study conducted by Adam (1959) showed a relationship between prenatal feeding choice and mothers’ personality and sanctions and standards of her environment. His study on 58 White mothers revealed that mothers who wanted to breastfeed (n=35) were more disturbed on penis envy and mothers who wanted to bottlefeed
(n=23) were dependent, had rejection feelings with their child and more psychosexual problems.\textsuperscript{110}  

Brown et al (1961) studied antenatal mothers. Those who wanted to bottle feed, were more concerned about their freedom, taxing demands of breastfeeding, becoming less attractive to their husbands if they breastfeed, fear of failure to provide the right kind of milk, feeling that breastfeeding, an old fashioned, no desire to breastfeed, ties down the mothers, too restrictive, nasty, conflicts over sexual connotations of sucking, messiness due to milk leaking, and spoiling one’s figure as a result of having to eat more, to breastfeed.\textsuperscript{111}  

**Parity**  

The influence of parity on breastfeeding is controversial. Few studies revealed that parity had a negative influence on breastfeeding and few revealed that parity had a positive influence on breastfeeding.\textsuperscript{112}  

**Socio-economic Status**  

The march to the bottle was began by high income group women in 1920 and march back to breastfeeding had been lead by the same group in 1960.\textsuperscript{99}
Scott et al found that the women from high social class have higher rates of breastfeeding. Special salaried group had higher breastfeeding rates than waged group revealed lower breastfeeding rates in women whose husbands had higher family income.  

Incentives to poor mothers had positive influence on breastfeeding. In contrast a study on 100 mothers revealed that at 3rd month exclusive breastfeeding was higher in the low income group 65% Vs 41% in higher income group.

**Employment**

Female role in the society, effect of social circumstances on the mother infant dyad, social class can affect breastfeeding.

Maternal employment, which is modifiable variable had a strong influence on breastfeeding. It is commonly believed that the most significant factor associated with the decline in breastfeeding and initiation of weaning is women’s need to work outside home for income. Although studies generally do find that work contributes to the decline in breastfeeding, it was reported that there are many
mothers who can continue to breastfeed despite working outside of the home, work is not the most significant factor reported (Agarwal et al, 1998).\textsuperscript{114}

More important factors appeared to influence the breastfeeding behaviour were the woman’s rate of pay, her control of her income, and the flexibility of her work situation. Many studies revealed that employment led to decreased duration and rates of breastfeeding. Few studies revealed controversial findings, which revealed that employment had a positive association with breastfeeding.\textsuperscript{100}

The mother-friendly workplace, pumping facilities in the workplace, part-time job, breastfeeding breaks, supervisor’s attitude, allowances to breastfeed can also influence breastfeeding rates.

**Prelacteal Feeds**

Pre-lacteal feeding practices are common in India and 30-40\% of mothers discard colostrum, thinking that it is harmful. This tendency not only causes infection but also reduces the sucking desire, thereby causing poor stimulation for breastmilk secretion leading to decreased breastmilk production. The belief that smaller infants should be fed additional foods to speed up the catchup growth should be removed by education.
Aggarwal et al (1998) reported that the low-income urban women in Delhi began top feeds before 4 months of age with non-human milks, usually highly diluted and prepared without proper hygienic conditions.114

We have mothers in Northern India who were keen to start artificial feeds right on the first day of birth in contrast to mothers in other parts of India who breastfeed for as long as 5 years.18

The earliest incidence of complementary feeding was seen in Indonesia (Launer and Habicht, 1989; Kardijati, 1996), where rice and mashed bananas are introduced in the first week of life. The belief, that supports this practice, is that children who are fed with a meal will be more calm and sleepy, and this will help the mother carry on with her work.9

Religion

Mother’s religious faith has a strong positive influence on breastfeeding. Religious leaders and clergyman can play an important role in improving the breastfeeding rates.115
The following quotations reveal that the advantages of breastfeeding were appreciated since the Vedic times and in all religions.

May four oceans full of milk, constantly abide in both your breasts, you blessed me for the increase of strength of the child

– Vedic Scripture116

Mothers shall suckle their infants for 2 whole years, that is for who wish to complete the suckling.

- Holy Quran. Surat EtBaqara

Verse – 233117

Having Breastfed

The satisfaction of having breastfed has a strong and positive influence on breastfeeding. 82% of mothers who were breastfed by their mothers also breastfed their babies.

Diet

Good nutrition is often considered necessary to enable a woman to initiate and maintain lactation. Due to paucity of information mother’s diet was mostly cereal based. So, special attention to nutritional supplementation is to be given, in addition to diet during lactation. 118
Quality and quantity of breastmilk depend entirely on the type of diet consumed by mothers. If it is inadequate the stores are mobilized and this is evidenced by the fact that many mothers loose weight during lactation. An insufficient food-intake may affect the amount of breast milk secretion. In India, poor mothers have always practised the salutatory practice of breastfeeding.119

A study by Bishnoi et al (1999) in Haryana revealed that to start the process of lactation, immediately after the delivery, the mother knew that she should take additional nutrients to nourish the rapidly growing infant.118

Women in lactation often report about an increased feeling of thirst than usual, especially near a feed. Lactagogues are special foods, drinks or herbs which are believed to increase a woman’s milk supply. Tea and coffee contain theophylline which can increase pituitary prolactin secretions, thereby increasing milk secretion.9 A study done by Sathiyapriya and Vijayalakshmi (1998) on 55 infants revealed that the increased prolactin and increased milk output was proved by ELISA test, where Satavarex herbal mixture, Asparagus racemose,
garlic supplementation, drumstick leaves were given to nursing mothers. Ginger, garlic, coconut, jaggery, bajra, ghee, fenugreek are also used as lactogogues.120

Marital Status and Planned Pregnancy

Higher breastfeeding rates are observed among married mothers. If the pregnancy is planned, the breastfeeding rate increased as 62% of mothers with planned pregnancies breastfed their babies whereas only 34% of mothers breastfed whose pregnancy was unplanned.77

Drugs

Medications may hinder or enhance breastfeeding. Oxytocin stimulates the milk ejection reflex and helps in emptying the ducts during breastfeeding. It also assists in the release of pituitary prolactin necessary for milk production. Metoclopramide and chlorpromazine also stimulate milk production.9 The use of Contraceptive pills decreased exclusive breastfeeding rates, especially estrogen containing oral pills.73
Time of Making Feeding Decisions

Many mothers take decision about feeding choices early in pregnancy. The decision to breastfeed strengthens the psychological predisposition to breastfeed.99

Cigarette Smoking

It is not ideal to smoke and breastfeed, but it is worse to smoke and ignore breastfeed. Mothers who smoke are less likely to intend, initiate, and also breastfeed for shorter duration. Cigarette smoking had a strong and negative influence on breastfeeding as revealed by many studies.100

Illness of the Mother’s Health Related Factors

Naturally, when the mother is sick, the breastfeeding rate is reduced she cannot take the care role for she herself needs a caregiver. Rest is likely to help in a way, by enabling the mother to feed her infant frequently and from diverting her thoughts from other activities.9

Anaemia, a mother on medications, post delivery surgery, gestational diabetes, painful births, AIDs and birth weight of the baby are negatively associated with breastfeeding.101
Study conducted by Witte PM et al (2004) revealed that out of 215 women who underwent reduction mamoplasty, 90 started breastfeeding and 57 were successful and it was equivalent to breastfeeding rate in non-operated women. Mothers with severe depressive disorders, on radioactive isotope therapy and chemotherapy etc are some of the contra indications.

Co-sleeping

A Study by Stein et al (1997) revealed that co-sleeping increased night feedings which help in milk production. McCoy RC et al reported that bed-sharing increased the frequency and duration of breastfeeding.

Breast and Nipple Problems

The inverted nipples, abnormal nipples, painful, sore, cracked, breast abscess, infections, engorgement, milk coming too slowly or too quickly, (28i) and empty breasts affected breastfeeding negatively.

Onset of lactation was easily identified across cultures with majority of women reported between 1 to 148 hrs post-partum. Delayed onset more than 72 hrs, is a risk factor for shortened duration of breastfeeding and greater weight loss in babies by the age of day 3.
Though infants can feed almost with any type of nipple Gunther (1945) found that nipple protracility of more than 2.5 cms led to successful lactation. 123

**Infant related factors**

Infants with severe illness, VLBW <1500gms, cleft palate, may not be able to suck and those with galactosemia, phenyl ketonuria, and maple syrup urine disease are some of the contra indication.9

**Family support**

When a mother gets the support of the family if or having a breastfeeding mother tends to breastfeed exclusively and also for longer duration.124 With the husband support the breastfeeding rate increased enormously.138,139 70% fathers who themselves were breastfed motivated their wives to breastfeed.

Study conducted in Perth, Western Australia on 425 aboriginal mothers, 89% of whom were breastfeeding and paternal support showed a positive association. 125

**Social Support**

Prior socialization is a strong factor for initiation, exclusiveness and persistence of breastfeeding. Societal attitude affects the infant
feeding. Peer influence can increase or decrease breastfeeding. If friends breastfeed (72%), mothers also breastfeed. Perception from current fashion together with family acceptance of bottle feeding as a symbol of sophistication, convenience, practical considerations led to bottle feeding. Advice from relatives, friends and support from experienced persons are positive factors, which promote breastfeeding.99

**Insufficient Milk Syndrome (IMS)**

Women say “I did not have enough milk, and gave off breastfeeding but the truth is that they only lack confidence and knowledge of, how to improve breastmilk output.9

The commonly cited reason by many mothers, in many countries was IMS and they start weaning before 4 months. Study conducted by Suvrapathi 1998, highlighted that out of 383 mothers, majority of the mothers expressed IMS for not breastfeeding.

In Mexico a study on 165 mothers by Millan SS et al (1994) revealed that 64-86% of mothers started supplements due to IMS. Perceived Milk Insufficiency (PM1) was the reason quoted by mothers (63-73%) using breastmilk substitutes. 61% of mothers reported PMI at
hospital by 1st week after delivery and 47% of them intended to introduce formula. PMI was based on mother’s perception of infants weight gain and misinterpretation of normal infant behaviour.

**Mass Media**

The good news is that we can effectively use the mechanism of globalization to create awareness about breastfeeding. Internet communication, e-mail have helped to connect our global community through which mothers, parents, women groups, health care workers, institutions and networks can find creative ways to ensure that infants are protected through breastfeeding. A study conducted in Abidjan, Africa, on 210 mothers revealed that 16% of mothers knew about advantages of exclusive breastfeeding through mass media. Mass media like television, radio have positive influence on breastfeeding as per WHO/UNICEF reports. At the same time, media portrayal of bottle feeding as normative, misinformation about breastfeeding and commercial promotion of formula, can influence breastfeeding negatively.

Breastfeeding is about peace and justice. It is the natural, universal and peaceful way of nurturing our children. In a world often
wracked by injustice, violence and war, breastfeeding can be a sentinel of peace-inner peace, peace with other people and peace with the environment”.

**Industrialization, Urbanization and Modernization**

The type of infant feeding that a mother chooses is a subject that appeared in the literature as early as 2000 years ago. It was not however until the early part of the 20th century that alternative feeding methods became readily available for the mothers reluctant to nurse.

Breastfeeding is a natural practice, yet many mothers practice artificial feeding. Neither these mothers aware of how they are depriving their babies of the benefits of breastfeeding nor of the dangers their babies face as a result of artificial feeding.

Urbanization has been one of the biggest obstacle to breastfeed in developed countries. Due to increased rate of industrialization and subsequent urbanization changes occurred in the century old traditions of breastfeeding and women are turning away from the established practice of breastfeeding.
After World War II and Cold Wars the decline in breastfeeding was related to psychosocial biases influenced by socio economic and historic trends.99

A serious threat to exclusive breastfeeding, for even up to 4 months, could arise from the fact that in the wake of rapid urbanization, a large proportion of rural women are migrating to urban areas where they get some jobs in unorganised labour sector with no guaranteed maternity leave. Thus, the women in urban slums will now be able to breastfeed for no more than a month. Vigorous and commercial promotion of formulae by industries alarmingly decrease the breastfeeding rate.8

Thus, modern life style stands in the way of quality motherhood, becomes a major obstacle, and encourages the mother to switch over to formula feeding.120 The needs of the infant can easily be jeopardized in this increasingly hostile environment. Baby-friendly practices can be lost, resulting in excess use of infant milk substitutes.

Hospital Policy

WHO/UNICEF (1989) reports revealed that health services failed to support and encourage mothers, interfered with normal
initiation and establishment of breastfeeding by separating mothers from infant at birth, giving glucose water, teats and by encouraging use of breastmilk substitutes. Hospital policies had strong influence in hindering or promoting breastfeeding.\textsuperscript{40}

Leon et al study findings revealed that destructive hospital policies, inappropriate interference of breastfeeding, early discharges, lack of follow up, distribution of free or discounted formula packs on discharge, rooming in only during day time delayed initiation, separation of mother and infant, restricted scheduled feedings, >12 hours interval between feedings, use of water, formula, pacifiers, bottles “exclusive alliance between hospital and formula company giving appearance of institutional endorsement, giving pre-lacteal feeds. When the infant is not discharged with mother, irregular child care allowing mothers only during day time and delay in first feed hinder breastfeeding strongly.\textsuperscript{128}

Rooming-in had a strong positive influence on Breastfeeding Study conducted at Mexico by Huerta S et al (1997) on 90 mother-infant pairs revealed that those who were roomed in had higher exclusive
breastfeeding rates (61%) than mother-infant pairs who were separated (n=88) and the exclusive breastfeeding rate was 42\%.^{129}

Breastfeeding was successful in hospital born infants where cots are kept alongside. Demand feeding led to successful lactation.

 Mothers delivering by LSCS, forceps extraction or with episiotomy had difficulty in reaching their baby if placed away. Hence the right thing is to keep them together. In fact, not only they should share the same bed; even the blanket should be shared “Blanketing in”.^{9}

Bloonguist HK et al (1994) infants at a Swedish hospital out of which 25% infants who received supplements were 3.9 times more likely not to be breastfed in 3 months.

Many other studies revealed that delivery at BFHs (Baby Friendly Hospital) increased, exclusive breastfeeding, overall breastfeeding and continued breastfeeding rates. Seth S.S. Hospital, Mumbai, statistical analysis by Parakhe et al (2004) revealed that BFHI programme increased exclusive breastfeeding rates at 6months to 92%
and timely complementary feeding rates to 95% revealing the sustainability of the programme.131

Merten et al (2004) study in Switzerland on 5790 neonates revealed that mothers who delivered in BFHs compared with mothers delivered in other hospitals had 35 and 29 weeks of any breastfeeding, full breastfeeding 20 and 17 weeks and exclusive breastfeeding 12 and 6 weeks.147

Role of Health Professionals

Nurses can play an influential role in consciousness raising, policy development and advocacy of breastfeeding support in promoting good mother-infant bonding.

Health Professionals have a positive role as mothers depend on them for child birth, they are likely to respect their opinion with regard to infant feeding. Also more prenatal visits increased breastfeeding.132

Bhuji survey conducted by BPNI at Gujarat, revealed that exclusive breastfeeding of new born and survey recommended that Anganwadi workers should be trained to educate antenatal, post natal mothers to practice exclusive breastfeeding. When the need arise,
specialized help from health services, with day to day support from a community based easily available person can exert more influence over infant feeding practices.\textsuperscript{132}

The greater the emotional support from health care provider, the better the coping with breastfeeding. Hence, the importance of prolonged guidance. Inadequate preparation during antenatal visits can lead to unsuccessful lactation.\textsuperscript{187}

**PREVALENCE OF BREASTFEEDING IN INDIA**

In developing countries breastfeeding is common since time immemorial but exclusive breastfeeding is not popular. A decline in number of mothers breastfeeding each year was noted in 3 metropolitan cities in India. Breastfeeding was, very much a living tradition in India and infant foods had not significantly affected the breastfeeding habits in India until recent times. Although breastfeeding is universal in India there are wide interstate differences in exclusive breastfeeding rates. The following studies reveal the prevalence of feeding practices in different states of India and many countries all over the world. Despite the fact that breastmilk is best for infants it is unfortunate that about 50\% of infants in the first 3 months of life are not exclusively breastfed.\textsuperscript{3}
## Initiation and Feeding of Colostrum in India

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Place</th>
<th>Sample Size</th>
<th>First Feeding Started (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nita Bhandari</td>
<td>2003</td>
<td>Harayana (R)</td>
<td>412</td>
<td>24% Initiated</td>
</tr>
<tr>
<td>Sharma S (1997)</td>
<td>2000</td>
<td>Harayana (R)</td>
<td>200</td>
<td>&lt;3 hrs – 28% &lt;24 hrs – 82%</td>
</tr>
<tr>
<td>Swamy et al</td>
<td>2002</td>
<td>Chandigarh Bombay</td>
<td>223</td>
<td>Fed Colostrum 66% 17% 71% 100%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Karnataka (R)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Andhra Pradesh (T)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharan et al</td>
<td>2001</td>
<td>Bangalore (R)</td>
<td>306</td>
<td>0% &gt;1 hour &gt;24 hrs – 70%</td>
</tr>
<tr>
<td>Mallikarjun et al</td>
<td>2002</td>
<td>Karnataka (R)</td>
<td>420</td>
<td>&lt;24hrs – 77%</td>
</tr>
<tr>
<td>Anaja et al</td>
<td>2001</td>
<td>Delhi (US)</td>
<td>155</td>
<td>≤6hrs – 56% &gt;48hrs – 22% Not fed colostrum –44%</td>
</tr>
<tr>
<td>Rasania Sachdev</td>
<td>1999</td>
<td>Delhi</td>
<td>327</td>
<td>&lt;2hrs – 20% 2-6hrs - 20% 6-12hrs – 14% 12-24hrs – 15% 24-48hrs – 12%</td>
</tr>
<tr>
<td>Kukarani et al</td>
<td>2004</td>
<td>Kolamboli Mumbai (U)</td>
<td>122</td>
<td>&lt;6 hrs Majority 27% discarded colostrum</td>
</tr>
<tr>
<td>Yadav P. Singh</td>
<td>2004</td>
<td>Bihar all Districts</td>
<td>R - 6676 U - 1279</td>
<td>Urban   Rural</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;24hrs 30% 28% 2 day 35% 36% 3 day 36% 36% Discarded Colostrum 63% 66%</td>
</tr>
<tr>
<td>Reddy S</td>
<td>1995</td>
<td>Hyderabad</td>
<td>100</td>
<td>Mean initiation 45 hrs</td>
</tr>
<tr>
<td>Deeksha</td>
<td>2005</td>
<td>Tonk District, Rajasthan</td>
<td>699</td>
<td>&gt;24hrs 2/3 of the infants</td>
</tr>
<tr>
<td>Suvrapathi</td>
<td>2005</td>
<td>Orissa</td>
<td>699</td>
<td>12-24hrs – 18% 24 - 48 hrs – 41.5%</td>
</tr>
<tr>
<td>Gattani et al</td>
<td>2000</td>
<td>Aurangabad (R) Orissa</td>
<td></td>
<td>&gt;2days – Majority</td>
</tr>
<tr>
<td>Bhale &amp; Jain</td>
<td>1999</td>
<td>Indore Hospital</td>
<td></td>
<td>100% - Fed Colostrum</td>
</tr>
<tr>
<td>Author, Year</td>
<td>Place</td>
<td>Sample Size</td>
<td>First Feeding Started (Hours)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Palival Khanna 144</td>
<td>Jaipur (R)</td>
<td>250</td>
<td>1-4hrs – 7% 4-12hrs – 92%</td>
<td></td>
</tr>
<tr>
<td>Janeja P &amp; Nidhi 145</td>
<td>Jhabia District Madhyapradesh</td>
<td>430</td>
<td>&lt;1/2 hrs – 19% 1-3hrs – 4% 2nd day – 2% 3rd day – 21% 4th day – 54% All discarded Colostrum</td>
<td></td>
</tr>
<tr>
<td>Adikary, Chowdhary 119</td>
<td>Pahariya Rajmahal Hills (T)</td>
<td>2500</td>
<td>&lt;3 days – 100%</td>
<td></td>
</tr>
<tr>
<td>Mridula and Mishra 146</td>
<td>Varnasi</td>
<td>142</td>
<td>&lt;6hr – 1% 6-12hrs – 35% 12-24hrs – 5% &gt;36hrs – 76% Discarded Colostrum – 54% No milk – 40%</td>
<td></td>
</tr>
<tr>
<td>Devadas et al 42</td>
<td>Coimbatore</td>
<td></td>
<td>80-95% - Fed Colostrum 24-35% - Fed Colostrum</td>
<td></td>
</tr>
</tbody>
</table>

**Initiation and Feeding of Colostrum in Other Countries**

<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Place</th>
<th>Sample Size</th>
<th>First Feeding Started (Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Das &amp; Ahmad 102</td>
<td>Bangladesh (R)</td>
<td>242</td>
<td>&lt;1/2hr – 60% &gt;24hrs – 20% &gt;3days – 20% Fed Colostrum – 8%</td>
</tr>
<tr>
<td>Farideh Sliva et al 147</td>
<td>Tehran Hospital</td>
<td>451</td>
<td>&lt;few hrs – 98%</td>
</tr>
<tr>
<td>Batters et al 148</td>
<td>England Whales</td>
<td>7382 mothers</td>
<td>62% 62%</td>
</tr>
<tr>
<td>Merewood A (2005) 149</td>
<td>U.S.</td>
<td></td>
<td>84% 70%</td>
</tr>
<tr>
<td>Bonuck KA (2005) 150</td>
<td>U.S.</td>
<td>Breastfeeding at Hospital</td>
<td>52% (1990) 70% (2001)</td>
</tr>
</tbody>
</table>
## Prelacteal Feeding Practices in India

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Place</th>
<th>Sample Size</th>
<th>Prelacteal Feeds</th>
</tr>
</thead>
</table>
| Dahiya S\(^{152}\) | 1992 | Haryana | 152 | Sugar Water – 50%  
Janam Ghutti – 30%  
Honey and Water – 15%  
Sugar and Omam – 5% |
| Survapathi\(^{44}\) | | S. Orissa | 383 | Honey – 38%  
Hot Boiled Water – 115  
Cow Milk – 9%  
Goat Milk – 9% |
| Sharma S\(^{133}\) | 2000 | Haryana | 200 | 72% - Prelacteal Feeds  
Honey & Janam Ghutti – Majority |
| Paliwal Khanna\(^{44}\) | 2001 | Jaipur, Rajasthan | 250 | Janam Ghutti – 41%  
Jaggery Water – 53%  
Discard Colostrum – 47% |
| Chada K\(^{133}\) | 1995 | Delhi, India | 100 | Janam Ghutti – 40%  
Animal Milk – 14%  
Other – 31% |
| Sharan et al\(^{32}\) | 2001 | India, Sericulture Families | 306 | Formula I - 75%  
Honey II - 68%  
Others III – 78% |
| Sharma D\(^{133}\) | 2005 | Tonk (Dist.), Rajasthan | 799 | Jaggery Water – 65%  
Tea – 30% |
| BPNI\(^{132}\) | 2003 | Gujarat, CARE India BPNI – Survey Bhuji Project |  | Jaggery Water  
Ghee  
Goat Milk  
Water 78% |
ADVANTAGES OF BREASTFEEDING

Advantages for Infants

Breastmilk is ideally suited to human needs. No wonder that ancient Ayurvedic writings described breastmilk as the sap of immortal life divine. - Zimmer

Epidemiological research shows that breastmilk provides numerous advantages for infants with regard to general health, growth and development while significantly decreasing a large number of acute, chronic diseases and deaths.

Psychological Advantages

Sensual contact is important for normal growth and development in infants. Breastfeeding provides frequent interaction between mother and infant, than by any other act of caring and baby gets closer relationship. Breastfeeding strengthens the bonding process, enhances psychomotor, cognitive and social development and forms the basis for necessary independence required by infants.

Early mother-infant contact even for few minutes assures positive experience. Early separation leads to disturbed infant behaviour during first year, viz. anxiety during nights, crying, screaming, colicky pain, vomiting, decreased weight gain, etc.
Successfully breastfed infants cry less. As they grow, they are more likely to develop stable personality, better cognitive and affective functions, perform better on developmental and intelligence tests and have better social adjustment.27

Breastfed infants were found to be more out going, assertive and comfortable in social situations. Thumb sucking, toilet training problems, sibling jealous are negatively associated with breastfeeding (Singh M 2002).27

Breastfed babies had higher cognitive scores. This was attributed to long chain fatty acids (AA and DHA) and other superior nutrients in breast milk and to the psychosocial stimulation intrinsic to breastfeeding.27

**Growth and Development**

Given that human growth and development represents a continuum beginning at conception, it is not surprising that neonatal nutrition has been shown to impact physiologic parameters later in life.154
The lowest protein content in breastmilk is adequate for the growth of human infants (Singh 2002). Breastmilk is the only scientifically established infant food, when exclusively fed ensures supply of all nutrients needed for growth and development till 6 months. The breastfed infant is the reference or normative model against which all alternative feeding methods must be measured with regard to growth, health, development and all other short and long term outcomes.

A study conducted at Nigeria at Ile Ife, on 345 mothers revealed that 76.5% infants were exclusively breastfed upto 6 months and the growth was above the 50th percentile.

In the first year of life, brain utilizes 60% of energy intake and weight of the brain increases from 350gms to 1000gms. Much of the brain weight is phospholipids, which differ from that of infants fed on formula. The healthy breastfed infant has appropriate strength and neurological maturity to perform the complicated maneuvers of rooting, fixing, sucking and swallowing.
In breastfed infants milk intake is slower but gastric emptying is faster. Energy intake and growth velocity are lower than US-NCHS standards in breastfed infants even in affluent, well-educated population. Neuro-transmitters and hormones present in breastmilk might affect the central control of nutrient intake.\textsuperscript{157}

A study conducted by Gulbin Gok Cay et al (2003) on 169 boys and 163 girls revealed that the mean weight of infants fed exclusively on breastmilk at one month was significantly higher. At 6 months the difference was 400gms more than predominantly breastfed and 500 gms more than partially breastfed and 200 gms more than non breastfed infants.\textsuperscript{158}

A study on 50 new borns, by Dipika Sur et al (2001) revealed that proportionate gain in weight of the exclusive breastfed infants was 111gms compared to 89gms in the partially weaned infant group.\textsuperscript{48}

A study conducted at Belgium on infants in their first month of life showed that those fed on hypoallergenic formula had 50\% reduction in weight and 30\% reduction in head circumference.\textsuperscript{159}
Recent evidence showed that formula fed infants have slightly lower IQ levels. There is scientific evidence that breastmilk promotes physiological, psychological, neurological, motor and cognitive development higher IQ levels, also higher scores on 2 language tests, better visual acuity and auditory ability.\textsuperscript{160}

Study on mothers (n=267) by Aruna et al (2001) revealed that mothers who breastfeed are stable during specific child rearing situations (positive deviance). Maternal response in terms of breastfeeding on demand rather than on schedule is the significant factor associated with positive deviance in motor, mental and overall development of infants.\textsuperscript{161}

**Nutritional Advantages**

Breastmilk provides ideal nutrition, endorsed as the best, healthiest, unparalleled way to feed infants. 100ml of breastmilk gives 66 kcals. Breastmilk is better digested, absorbed and utilized by infants immature gastro intestinal tract. Breastmilk has complete mixture of Vitamin B\textsubscript{1}, B\textsubscript{2}, B\textsubscript{3}, B\textsubscript{5}, B\textsubscript{8}, B\textsubscript{12}, A, D, E and K at optimum levels, also minerals like calcium, phosphorus, iodine, potassium, zinc, copper,
magnesium, selenium, molybdenum, sodium, etc. and carbohydrates, proteins like DHA, AA and their pre-cursors (Sally, 2000).162

Darling Study conducted in California, USA, showed that the energy, protein intakes were lower in breastfed infants due to self-regulation and not to inadequate maternal milk production. The lower intake and weight gain of breastfed infants are not related to adverse functional outcome like motor, developmental activity or morbidity.80

A study conducted by Bhalani et al (2002) on 417 infants breastfed upto 11months of age, the growth was comparable in infants of Europe and North America. Also, infants well nourished were 65% at 6 months and infants with Grade II and Grade III malnutrition were respectively only 5% and 1.4%.163

A study conducted at Burkino Faso, on 152 children, aged 12 to 36 months, admitted with diagnosis of malnutrition were compared with healthy controls revealed that children received solid foods had a 3 fold higher risk. The authors offered 3 possible explanations that are nutritional content and protective agents in breastmilk and the fact that ill children continue to feed on breast while rejecting other foods.164
Morbidity and Mortality

Many mothers have been denied the joy of seeing their children grow up not because of rare diseases, sudden disasters or poverty, but because they were deprived of the right to breastfeed.

Breastmilk ensures decreased risk for many acute and chronic diseases. It saves life more than any other health intervention strategy.\textsuperscript{120}

Numerous studies support that breast milk protects infants from many pathogens till the infant develops his own immune system. Breastmilk is the source of immunologic information. The breastfed infant ingests $10^8$ cells/day through breastmilk majority of which are macropages.\textsuperscript{80}

After vaccination, breastfeeding also enhances response to BCG, OPV, tetanus, human influenza type b and Diphtheria vaccines. Breastmilk may induce passive transfer of B cell, T-cell-immunity from mother to infant. It has growth factors for maturation of organs.\textsuperscript{79}
There is decreased rate of morbidity and mortality in breastfed infants who belong to poor strata (Dr. Hiro Shi Nakajime, D.G., WHO (1993) The post neonatal mortality rate decreased by 21% in breastfed infants. Prolonged breastfeeding is associated with significant risk reduction reflecting greater protection and decreased risk of death in infants.¹⁶⁵

Bottle and Artificial Feeding related Under Nutrition and Immune Deficiency Syndrome, (BAFUNIDS), a new syndrome coined by Kushwaha et al studied 75 such infants. All infants were from poor strata, fed artificially, did not receive breastfeeding advice. Not breastfeeding must have played a greater role in the death of (42%) these infants.¹⁶⁶

**Gastro intestinal Infections**

Breastfeeding prevents and attenuates severity of diarrhoeal diseases, specially enteric pathogens such as rotavirus, giardia lamblia, shigella, entomeba histolytica, cryupto sporidium parvum, compylobactor, E.coli, etc.¹⁶⁷

Breastfeeding supports gut maturation by providing growth factors such as epidermal growth factor, insulin like IGF growth factor,
(IGF) etc. Insulin interacts with gut mucosa and promotes its maturation. The level of insulin in breastmilk is no way comparable with levels found in cow milk and to the worse, insulin is barely detectable in formula.\textsuperscript{168}

Breastfeeding is an extreme, effective means of protecting infants from enteric infections. During diarrhoeal episodes, breastfeeding is a proved life saver. Partial breastfeeding also has stronger protective effect even at highly contaminated environments.\textsuperscript{80}

Breastfeeding has strong, protective effect against mortality due to diarrhoea up to 18 months of age. Exclusive breastfeeding protects infants for the first 6 months of life from diarrhoea. Non-breastfed infants have 30 times greater risk for attacks of severe diarrhoea requiring hospitalization and breastfed infants are 14 times less likely to die from diarrhoea.\textsuperscript{48}

A study on 114 infants revealed that the incidence of diarrhea was only 12% Vs 40%. Out of 114 infants who were partially breastfed the incidence of diarrhoea, cold, fever, vomiting were significantly lesser in the exclusively breastfed infants.\textsuperscript{135}
A study was conducted at Karachi on 106 infant deaths, on analysis the causes found were diarrhoea (34%), respiratory infection (9%), under nutrition (10%), sudden deaths (7%), and neonatal deaths (13%) and infants. The infants who died were 12 times more likely not to have been breastfed.\textsuperscript{169}

Breastmilk appears to be protective against NEC as IgA in breastmilk coats newborn’s gastro-intestinal system and prevents penetration against bacterial invasion and macropages provides resistance against NEC.\textsuperscript{71}

**Respiratory Infections**

Breastfeeding prevents and attenuates pathogens like influenza, streptococcal pneumonia, etc. Breastfeeding reduces the incidence of respiratory infections. A study conducted in Perth, Western Australia by Oddy et al (2003) on 2602 children revealed that risk for \( \geq 4 \) upper respiratory tract infections were greater when breastfeeding was stopped. The breastfed infant is 4 times less likely to die from respiratory infections and less often hospitalised.\textsuperscript{71}

A study was conducted at Poto Alegre, Brazil, on children 510 healthy controls, 510 cases with pneumonia revealed that non-breastfed children had a 3 times greater risk of contracting pneumonia.\textsuperscript{170}
Urinary Tract Infections (UITs)

There is reduction in the incidence of UTI in exclusively breastfed infants. It has also long term effects on renal function.80

AIDS

A study conducted by Coutsoudis et al (2001) in Durban, South Africa revealed that infants exclusively breastfed for 3 months or more had no excessive risk of HIV infection at 6 months than those never breastfed.19

Protection Against Other Diseases

Bacterial meningitis, botulism, dental caries, bacteremia, neonatal convulsions, multiple sclerosis, rickets, otitis media, xerophthalmia, hypoglycemia, hypocalcemia, tetany and liver diseases are also lower in breastfed infants.71

Obesity

Formula fed infants are fatter than breastfed infants as the latter self-regulate their intake. A study conducted at Germany revealed that breastfeeding had a protective effect against obesity in children at 5 years of age.80
Gillman conducted a study on 15,000 children between 9-14 years almost confirmed that infants fed with breastmilk primarily and for longer duration, have reduced risk of obesity.\textsuperscript{196c} 

Pettitt et al did a study on Pima Indians found that children breastfed for atleast 2 months exclusively, had significantly reduced rate of NIDDM as adults.\textsuperscript{154} 

The greater insuline release in formula fed infants leads to excess of fat deposition and excess of adipose tissue predisposes to adulthood obesity.\textsuperscript{33} 

**Malaria** 

Lactoferrin enhances production of superoxide and hydroxyl radicals which damage the cell membrane of pathogens. (e.g. plasmodium falciparum) . Thus breastmilk has protective in vivo role in the possible modulation frequency, severity and mortality due to malaria. This is a strong rationale for encouragement of breastfeeding as a means of providing infants passive immunity against malaria in the endemic population. \textsuperscript{54}
Hyperbilirubinemia

Colostrum has laxative effect and thus early initiation of feeding with colostrum prevents physiological jaundice. If breastfeeding is not initiated successfully and become associated with dehydration, caloric deprivation and excessive weight loss, may cause higher Total Serum Bilirubin (TSB) levels in breastfed infants which is most often benign.\textsuperscript{215} AAP, Sub-committee on management of hyperbilirubinemia prioritized breastfeeding as the first guideline.\textsuperscript{172}

Anemia

Fifty percentage of the iron in breastmilk is absorbed compared to only 10% from cow milk. A study on 164 infants revealed that the risk of iron deficiency is less among infants with birth weight $>3000$gms and who are exclusively breastfed for 6 months.\textsuperscript{9,173}

Allergy

It is not a surprise that breastfed infants ever had developed intolerance. Breastfeeding protects from allergic diseases. Breastmilk is nature’s hypo allergenic, antiallergenic food. Eczema, asthma and food intolerance are lesser in infants who are breastfed even with family history of allergic disease and breast milk prevents allergy.
As SLgA inhibits absorption of macromolecules. Eczema is 7 times more common in infants fed on cow’s milk. 83.3% of infants fed on formula or cow milk developed wheezing or eczema compared to 30.7% of breastfed infants.28

Sudden Infant Death Syndrome (SIDS)

Incidence of SIDS in the first year of life is low in breastfed infants. A study conducted by Horney et al (2004) on 43 term infants using nasal air jet stimulation, at 2 to 4 weeks, 2 to 3 months and at 5 to 6 months showed that breastfed infants had longer sleep cycles, were more arousable at 2-3 months of age from active sleep. During this time only the peak incidence of SIDS occur in formula fed infants. 174

The New Zealand Cot death Study of 356 cases, when compared with 1529 healthy term infants, revealed that breastfeeding was associated with lower risk of SIDS. 164

Pain

Breastfeeding provides the most potent, pleasant stimulation for the baby. For newborns, non-nutritive sucking and skin to skin contact
during breastfeeding decreases pain associated with invasive procedures (e.g. heel stick procedure).\textsuperscript{139}

A study conducted on 180 infants revealed that pain scores were nil to <3 for significant number of babies (16 out of 45) on DAN pain scale who were breastfed (Group I) during the venepuncture. Rest of the babies had pain scores >3. (Group II, held in mother’s arms; Group III given sterile water; Group IV given glucose water).\textsuperscript{39}

**Advantages for High Risk Infants**

Contemporary research shows that breastmilk is by far the safest for Low birth weight (LBW) infants.\textsuperscript{29} Moderately LBW infants, fed with breastmilk, grow more rapidly equivalent to intra uterine rate of growth without metabolic stress than formula fed counter parts had neurological developmental advantages and NEC also is reduced. LBW infants who can suck can also be put on the breast immediately after delivery.\textsuperscript{175}

In urban slums of Calcutta, Dipika Sur et al (2001) (n = 50) the proportionate weight gain of LBW infants who were exclusively breastfed showed that breastmilk is THE IDEAL FOOD, for LBW infants and their proportionate weight gain exceeded infants who had
normal weight at birth and exclusively breast fed and the incidence of diarrhea also was significantly less.\textsuperscript{48}

A study conducted by Yun Boo et al (2000) in Malaysia on 152 LBW infants revealed that 32.2\% of these infants survived and first, out of the three factors significantly associated with survival was exclusive breastfeeding.\textsuperscript{176}

In pre-term infants (33 weeks) the fractional excretion of sodium falls to less than 1\% soon after birth, which is easily achieved by feeding breastmilk.\textsuperscript{36} An inverse relationship between exclusive breastfeeding and long terms benefits for pre-terms by many studies, viz, hypertension, hypercholesterolemia and coronary artery diseases ischemic heart disease, higher scores on psychomotor development by 18 months and intellectual performance by 8 years.\textsuperscript{138}

Breastmilk is best suited for pre-term. Hence biological mothers can feed their infants as breastmilk ensures remarkable catch-up growth, in spite of adverse social and environmental conditions. Pre-term infants fed on breastmilk only when compared with preterm infants on mixed feeding showed significant gain in weight at 4 months
of age. The head circumference also was significantly higher (p < 0.001). Late onset sepsis is less common in exclusively breastfed pre-terms.\textsuperscript{177}

**Long term Advantages**

The benefits of breastfeeding are not only for the present, also for the future. Breastfeeding prevents or reduces the occurrence of diseases like; atherosclerosis, Crohn's disease, leukaemias, Hodgkin's disease, ulcerative colitis, chronic digestive diseases, lymphoma, malignant neoplasms in childhood, atopic dermatitis, hypertension, arterio sclerosis, bronchial asthma, multiple sclerosis and celiac diseases. Breastfed babies tend to have lower incidence of Juvenile onset DM.\textsuperscript{9,27,71}

Breastfeeding during early life, imprints favourable cholesterol metabolism later in life and lowers BP levels. There is decreased endogenous synthesis in children, as adults and there is decreased fractional synthesis rate of cholesterol levels.\textsuperscript{33}

An important factor in the development of diabetes in genetically susceptible infants is that they have antibodies to 17 amino acids fragments of bovine serum albumin (BSA) which are formed as a
result of exposure to cow milk in early life, instead of a stepwise exposure which triggers the auto immune system precipitate the auto-immune process and destroys the β-cell mass.\textsuperscript{178}

Adults who had been breastfed showed higher significant scores in the test of reasoning and word power than men who were bottle fed.\textsuperscript{179}

Healthy adults reflect and remind that they have been breastfed during their early life.

**ADVANTAGES OF BREASTFEEDING FOR MOTHER**

There are number of studies that indicate the possible health benefits for mothers because of breastfeeding. Breastfeeding ensures the fulfillment of mothering instinct, helps her to recover physically from delivery, gives her emotionally and psychologically gratifying experience. So when the baby is delivered, before the cord is cut, the baby should be placed on mother’s abdomen.\textsuperscript{180}

**Psychological Advantages**

Placing the baby at the mother’s breast immediately after delivery is an excellent way of beginning mother-infant bonding.\textsuperscript{181}
Mothers who breastfeed immediately after delivery spent more time playing, kissing, had face to face contact more often, talking to infants, held them close on their left side, nearest to their heart, spoke with fewer commands, used more adjectives which showed their love and praise for the infant, twice more, for as long as four years than the other mothers, who were separated from their infants after delivery.179

Satisfactory breastfeeding in infancy is a firm basis, on which to build future mother–child relationship. The ecstasy of breastfeeding gives sense of fulfillment, self-respect and improved sense of self-esteem which leads to reduced incidence of child abuse, neglect and battery. It allows more time for other family members. Thus, breastfeeding benefits the whole family emotionally and economically.80

Women who breastfeed are calmer, have less intense response to adrenaline due to higher prolactin levels. Leading to fewer depressive symptoms, low moods, and enhanced physical and mental health. 27

**Physiological Advantages**

*Advantages at the time of delivery of the placenta*

It is proved beyond doubt by many studies, that the cry of the infant and sucking at nipples immediately after delivery, causes a direct reflex stimulation to the posterior pituitary gland to secrete the
hormone oxytocin. This causes not only contraction of the myoepithelial cells of the breast to eject milk, also contraction of the uterus, resulting in expulsion of the placenta during third stage of labour. Breastfeeding in third stage reduces its duration also minimizes blood loss, thus minimising the risk of post-partum hemorrhage and which can kill the mother if proper monitoring is not done. Continued sucking is considered to be important to promote normal involution of the uterus as oxytocin released in response to sucking strengthens uterine contraction and women experience painful cramping.82

Anemia

The total amount of blood loss immediately following delivery is reduced to minimum if suckling starts immediately and reduces the severity of anemia a mother would have. Lactational amenorrhoea causes recovery of iron stores as it decreases life time menstrual blood loss.138

Osteoporosis

Secondary analysis from National Health and Nutrition Examination survey (1994) revealed that breastfeeding reduced the incidence of osteoporosis.66 A study conducted in Sacramento, U.S.A.
the BMD of adolescent mothers who breastfed their infants (n=94) were compared with adolescent mothers who did not breastfeed (n=151), adult mothers who breastfed their babies (n=67), adult mothers who did not breastfeed (n=89) and with nulliparous adolescents (n=418). The BMD was higher in adolescents who breastfed than who did not and the BMD was equal to that of nulliparous adolescents.\textsuperscript{182}

**Obesity**

Breastfeeding helps mother’s body to return earlier to normal after delivery, than non-breastfeeding mothers. She drains the extra fat which she gained during pregnancy. Secondary analysis of 61 studies from Medline search by Ownes et al (2005) showed that there is immense association between breastfeeding and obesity in later life. The association was strong in 11 small studies (<500 subjects) and still apparent in larger studies (> 500 subjects).\textsuperscript{26}

**Sleep**

Prolactin, the hormone, responsible for milk secretion is secreted more at nights and has calming effect on mothers. Study by Quillin and Glenn (2004) at Johnson City, USA on 33 mothers and newborns revealed that co-sleeping increased breastfeeding mothers total sleep time.\textsuperscript{183}
Breast, Ovarian and Uterine Cancer

Breastfeeding has been reported to reduce the risk of ovarian cancer, pre and postmenopausal breast cancer and uterine cancer by many studies.99

Icelandic Cohort I Cancer Society Reports on 80,219 women who attended the screening program showed that breastfeeding reduced the risk of breast cancer, under the age of 40 and it may offer protection for older cases also.184

A study done by Zheng T et al (2001) in Connecticut, 609 breast cancer cases were age matched(30-80 years) with 609 controls. Parous women who reported ever lactated had a significantly reduced risk of 17%. Reduction of 50% risk was observed in those having breast fed more than 3 children for more than 13 months than mothers who never lactated.185

Lactational Amenorrhoea Method (LAM) of Family Planning

Medical literature from Aristotle, the Renaissance and occasionally thereafter noted that women who suckle are less likely to
become pregnant. The phenomena was forgotten or disbelieved in recent decades.\textsuperscript{173}

Breastfeeding causes diminished pituitary response to hypothalamic release of GnRh pulse generator and LH response to GnRH bolus occurs.\textsuperscript{72}

Breastfeeding can be considered as one of the natural family planning method, effectiveness are comparable very favourably with other natural family planning methods.\textsuperscript{27}

In 1988, research findings of several countries around the world were shared at Bellagio’s consensus. Where here, LAM was developed as a clinical algorithm and guidelines were prepared and is recommended by WHO as natural, family planning method with the 3 criteria 1) Menses has not yet commenced. 2) Exclusively breastfeeding 3) Mother is within 6 months postpartum with effectiveness 98\% upto 6 months and 94\% between 6-12 months post-partum. Postpartum amenorrhoea is lactation induced contraception which increases the secretion of prolactin which inturn decreases estrogen and progesterone thus inhibiting ovulation.
Middle class urban mothers (n=170), who have planned to return to work were educated on LAM, exclusive breastfeeding, and use of expressed breast milk and the cumulative pregnancy rate at 6 months was 5.2%.

So the integration of LAM into overall strategy of Maternal and Child Health Family Planning (MCHFP) is a strong ground for national policy makers to halt the decline in breastfeeding, and already it is included in Family Health and MCH policy of several countries.138

Social Advantages

Breastfeeding is easy, economical, any time but requires only time and will on part of the mother. It does not need storage, sugar, bottles, teats, fuel, money etc. 27

Social acceptability (community approval) is more, going out is made very easy for mothers who breastfeed. Breastfeeding empowers women as it makes her indispensable to the baby. 27

Breastmilk is available to the infant whenever and wherever he needs it, and at the correct temperature too. It is easy to feed at nights
while traveling and mother need not worry about milk spoiling and running out of supply. It is inexpensive as it is produced at the mother’s expense and the cost of nutritional upkeep of a lactating mother is easily affordable.

ADVANTAGES FOR THE NATION

Breastmilk is neither traded nor priced. Its economic value is lost to planners and economists. The idea that breastmilk should be replaced by artificial milk is akin to say that normal kidneys should be replaced by dialysis machines. The benefits of breastfeeding are not only to babies and mothers but also to the nation. Breastmilk is one of the few foodstuffs, which is produced, delivered and utilized without pollution and wastage.

Bottles, teats and related equipments require plastic, glass, rubber and silicon which are usually reused but rarely recycled. All these products waste natural resources and incineration of plastics releases dangerous dioxins. Women who do not breastfeed start menstruating early and the sanitary material that may be flushed down the toilet, causes pollution, of ground water. Artificial milk requires to go through many processes before it reaches the infant, all of which consume huge amounts of time, energy, finance, and human resource
also earth’s valuable natural resources and leave polluting wastes which exist in our environment, at dangerous levels for long periods.9

Breastfeeding is a natural source of enormous value which is overlooked by all of us. In India About 22 million nursing mothers on an average secrete about 3.7 million tonnes of milk annually.9 It would take 135 million cows to replace the breastmilk of the women of India. 48 per cent of the surface area would have to be devoted to pasture cows. Deforestation leads to soil erosion and depletion, decrease in the flora and fauna species. Cattle produce 100 million tons of methane annually. The disposal of excreta cause water pollution. The ammonia from open slurry tanks and cow peats is a cause for acid rain it attacks leaves. The nitrate fertilizers used to grow fodder, contaminate water.9

The cost of bottle feeding for a three month old baby per month comes to Rs. 742. This is equal to 50% of minimum wage of an urban worker, 40% of the income of a class IV employee, 10% salary of a class I officer. Cow milk costs Rs. 340 per month to feed the same baby.

The mother requires 185gm of rice and 30gm of pulses in addition to normal diet to produce one litre of milk costing around Rs.4. The total cost of producing 3944 million litres of milk is approximately Rs. 1578 crore. If we deduct this cost from the market
value of realistic breastmilk production (based on tinned milk), the value of breastmilk would still be 10,254 crores.9

**Breastmilk as a National Resource**

The economic value of breastfeeding each year is comparable as per central budget (1998-99), Government of India, to various central plan developmental sectors. It is equal to the plan outlay of Department of Industry and Department of Power, more than the allocation for Railway and three times that of Department of Education, Department of Health and Family Welfare, and Department of Science and Technology. It is almost 10 times the allocation for Department of Women and Child Development. The value of breastmilk is almost 12% of our central plan outlay (Rs. 1,05,187 crores).9

A number of valuable non-monetary contributions made by human milk emerge, which may or may not be quantifiable.

The list of advantages goes on A – Z : A for Amenorrhoea upto Z – Zero waste : 26 reasons to nurse your baby amplifies the advantages of breastfeeding (Leaven, 1997).
EFFECTIVENESS OF EDUCATION ON BREASTFEEDING

Milk secretion is a robust process that proceed normally in at least 85% of post-partum women. Anecdotal evidence suggest that with assistance in the techniques of breastfeeding 97% of women can successfully breastfeed. Scientific advances of 20th century have brought changes about what could be termed as World Renaissance on Breastfeeding.

Breastfeeding is a major public health issue extensive research documented and reconfirmed the diverse and compelling advantages of breastfeeding.186

Knowledge dispels fear and anxiety, which arise out of the unknown, builds up confidence, self-esteem and ultimately empowerment. Antenatal classes, face-to-face interaction in the immediate postpartum period can improve breastfeeding rates. Providing education removes anxiety and has a positive effect on hypothalamo pituitary axis to secrete the hormone oxytocin. Many mothers attempt to breastfeed but do not continue it. Breastfeeding can always be successful, provided mother wishes to do so and she receives encouragement to early initiate which leads to longer
breastfeeding. Given the knowledge about benefits of breastfeeding who would not want to make the choice of breastfeeding for their baby.\textsuperscript{27}

Support, guidance and counseling, and education can always increase initiation and rates of breastfeeding. At the same time too much stress on breastfeeding preparation may decreases interest of mothers.\textsuperscript{187} Most health professional use their old knowledge or own experience to help breastfeeding mothers. To produce smart children, smart society comprising of skilled front line workers are essential.\textsuperscript{9}

NFHS II (1998-1999) revealed that advice to mothers about feeding of colostrum, not to use bottles, nipples and exclusive breastfeeding for 6 months and beyond along with appropriate complementary foods could reduce the prevalence of stunting by 30\%.\textsuperscript{188}

Much has been learned about effective interventions to enhance the practice of exclusive breastfeeding during first 6 months. A review by Coahrane Collaboration (2005) on breastfeeding intervention concluded that to enhance optimal breastfeeding practices women need support from health professionals from community, work place and from campaigns.\textsuperscript{189} Rural communities in Gambia incorporated
traditional beliefs, practices, into modern message included husbands and elders as an expanded target group who are found to be highly influential in the practice of breastfeeding. (IBFAN Asia Pacific - BPNI 2006).

Not seeing colostrum on hand expression does not mean that it is not there but it is produced in very small quantities (36 ml/day and 6-13ml/feeding).

A normal infant may breastfeed 2000-3000 times/ year. It should be done, in a way which brings enjoying experience for both mother and infant.71 Newborns should be nursed whenever they show signs of hunger, such as increased alertness or activity, mouthing, or rooting. Crying is a late indicator of hunger. When the baby is well-positioned at the breast, the baby’s mouth is wide open, the tongue is slightly visible, lips are everted, chin is touching the mother’s breast and most of the areola is well inside the baby’s mouth. Newborns should be nursed approximately 8 to 12 times every 24 hours until satiety, usually 10 to 15 minutes on each breast. In the early weeks after birth, non-demanding babies should be aroused to feed, if 4 hours have elapsed since the last nursing. Appropriate initiation of breastfeeding is facilitated by continuous rooming in.27
Should hospitalization of the breastfeeding mother of infant be necessary, every effort should be made to maintain breastfeeding, preferably directly, or by pumping the breasts and feeding expressed breastmilk, if necessary.27

**Studies related to Education and Support from Health Care Providers**

A study conducted in Brazil by Santiago et al (2004) revealed that the role of pediatrician in the promotion of breastfeeding was found to be similar to a multi professional team in terms of promoting exclusive breastfeeding.190

A study conducted by Chertok et al (2004) in Israel on Jewish. Muslim mothers who underwent caesarean section revealed that exclusive breastfeeding rates increased for mothers (n = 306) who received guidance on Breastfeeding than the control groups (n = 264).191

A longitudinal study was conducted by Barros et al 1995 in Brazil on 605 infants from birth to 6 months, delivered at hospital and who were roomed in during hospital stay. Mothers in intervention group were referred to lactation centre 1st home visits at 1, 4, 6 months were given. Exclusive Breastfeeding rate at 1 month, 4 months, 6
months was 55% and 31%, 43 and 18%, 15% and 6% in the experimental and control group respectively.\textsuperscript{192}

A study conducted by Kramer et al 2001 in Republic of Belarus under PROBIT (Promotion of Breastfeeding Intervention Trail) with one year follow-up in 31 maternity hospitals and poly clinics on 16,491 mother infant pairs, where mothers in the intervention group received health care provider’s assistance postnatally for initiating and maintaining breastfeeding. Results showed that at 3 months and at 6 months the exclusive breastfeeding rate was 43.3% and 6.4, 7.9% and 0.6% in the intervention and control group respectively.\textsuperscript{193}

A study conducted by Lana et al (2004) on 80 mother infant pairs at Brazil to assess impact of 17 steps to promote breastfeeding revealed that significant increase in the breastfeeding duration when compared with controls (n = 67).\textsuperscript{194}

A study was conducted in Tema, on antenatal women by Aidam et al (2005). Mothers in the intervention group 1 (n = 43) received breastfeeding educational support pre, peri and postnatally along with educational sessions and 9 home visits. Mothers in intervention group
II (n = 44) received all above but breastfeeding support was given only peri and postnatally. All mothers had equal contact with lactation counselors. Results revealed that exclusive breastfeeding rate at 6 months were significantly higher, was 90%, 74.4% and 47.7% for mothers in group I, group II and controls respectively.\textsuperscript{195}

A cohort study from 1984-1997 was conducted by Saleem et al (2004) at Lahore, Pakistan, on postnatal mothers. Mothers in Cohort A (n=482) were not given counseling. Mothers in the Cohort B (n=544) Cohort C (n=578) and Cohort D (n=444) were given counseling on breastfeeding. Percentage of mothers in 4 cohorts A, B, C, D initiated breastfeeding were within 44-47hrs, 9-12hrs, 3-6hrs and <3 hrs, respectively and the percentage of mothers who had given pre-lacteal feeds were 99.9, 18, 10 and 4 and the percentage of mothers exclusive breastfeeding at one month and 4 months were 18 and 10, 82 and 14, 82 and 70 and 93 and 70 for Cohort A, B, C and D respectively.

A study conducted by Yeo A et al 2005 in Abidjan, Africa, on 210 mothers (n=210) revealed that many (90%) knew that breastfeeding is best, rich in nutrients, fights infections, free of cost and bottle is bad and 58% of mothers knew about exclusive breastfeeding. Of these 58%
mothers, health care providers were the source of information for 47% of mothers.\textsuperscript{196}

**Studies Related to Breastfeeding Education by Trained Peer Counselors**

Study by Chapman et al (2004) on Latina population, Puerto Rico, USA, revealed that Peer Counseling services one in antenatal period, daily perinatal visits, 3 postpartum visits and telephone contacts as needed, caused initiation to 91% than the controls (77%) and risk of stopping breastfeeding at 1 month decreased to 36% and 49% and at 5 months 56% and 77% in experimental and control group respectively.\textsuperscript{197}

The Bunso study findings led to the development of counseling of mothers (n=1000) in urban Manila who in turn, were able to invite mothers breastfeeding education classes, added with home visits had improved the initiation rates significantly.\textsuperscript{198}

Study on low income antenatal mothers enrolled in a health project, Chile, found that mothers in the intervention group who had 2 breastfeeding educational sessions, 1 antenatal visit trimester, a visit immediately after delivery, frequent post natal visits at home and
clinical check-ups when compared with controls who had visits in the clinic at 1, 2, 4, 6 months postpartum, revealed that peer educators influenced significantly the exclusive breastfeeding rates to 100% and 76% at 4 months 90% and 8% and at 6 months 42% versus 0% in the experimental and control group, respectively (Alvarado et al, 1996).199

Study conducted by Morran et al (1993) in peri urban city, Mexico, revealed that trained, community based peer counselors influenced exclusive breastfeeding rates significantly. Mothers in group I had 6 home visits, group II, had 3 home visits and the exclusive breastfeeding rate at 3 months was 62% in group I and 50% group II and 12% in the control group.200

A study to evaluate the impact of BFHI, in Taiwan by Gaumal (2004) on 4614 lactating women revealed that, mothers who had training from BHFI training program showed significant increase in the rates of overall, and exclusive breastfeeding, also higher knowledge and positive attitude towards breastfeeding.201

All these studies address, that mothers are in dare need for interpersonal and skilled support, to initiate and sustain optimal breastfeeding and appropriate complementary feeding practices, along
with continued breastfeeding upto 2 years or beyond which requires skilled training at various levels.

Mothers and Young girls need to be educated about the advantages of early Breastfeeding, giving colostrum, avoiding pre-lacteal feeds and also the disadvantages of bottle feeding. While adolescent girls are totally out of focus in our present health care system, a great deal of lip service is being paid to difficulty to reverse the decision not to breastfeed. Viewing breastfeeding as one of the number of health and nutrition policies, merits encouragement by everyone in the society.

Study recommended that health education programmes should focus on faulty, infant feeding practices. More in-depth studies to be done, to monitor and to initiate Breastfeeding and its continuation and incorporation of breastfeeding information in staff training and retraining.

United States Preventive Service Task Force Meta analysis US-PSTF revealed that combined with education, counseling and problem solving were more effective for breastfeeding in the first three months.202
A RCT to evaluate efficacy of lactation by Karen et al (2005) in US born women revealed that lactation consultant intervention which consisted of 2 pre-natal meetings, 1 post natal hospital visit and home visit and telephones calls revealed that 62% attempted to breastfeed in the intervention group.203

EFFORTS TAKEN BY THE GOVERNMENT AND OTHER ORGANISATIONS IN THE PROMOTION OF BREASTFEEDING

Every day, between 3,000 and 4,000 infants die from diarrhea and acute respiratory infections because the ability to feed them adequately has been taken away from their mothers. Thousand more succumb to other illness and malnutrition (UNICEF).40

Around 13 million deaths among children occur due to lack of exclusive breastfeeding. Optimum IYCF practices can prevent 19% of deaths among under 5 children, which means in India over 450,000 lives could be saved and this means saving 3000 babies everyday.71

For the past few decades only humans have tried to replace the natural means of feeding newborns, which is given to every mammalian species on earth. Each child comes with a message that “God is not yet discouraged of man”. If that be so, then all of us are
morally bound to look after the health and welfare of our children.

“The future of mankind cannot afford to disregard the crucial role of breastfeeding in discharging our duty”.204

Director General of WHO, Gro Harlem Brundtland, (World Health Report 2002) stated that in poor countries today there are 170 million under weight children over 3 million of whom will die this year as a result.

Any action, which helps women to save and improve their children’s lives, should be supported. Several recent developments have created a particularly favorable climate, for reintroducing the word’s health care practitioners to the unparalleled benefits of breastfeeding.5

In global economy, trade agreements and the economic interests of the transnational corporations often take precedence over the sovereign rights of the nation, where the need of mothers and children can easily be jeopardized. Viewing breastfeeding as one of the important aspect of health and nutrition policies merit encouragement by everyone in the society.5
WHO and UNICEF pointed out that poor infant feeding practices and their consequences is one of the world’s major problems. Efforts are needed at political, professional and at people level. Breastfeeding promotion is a co-operative endeavour in which governments, industrial groups and developmental agencies, organizations and mass media must participate.9

In 1939, Dr. Cicely Williams, a pediatrician in Singapore, found the link between promotion of breastmilk substitutes and increased malnutrition and deaths of infants, and spoke of this in a public address to the Singapore Rotary Club entitled “Milk and Murder”. She stated that ‘misguided propaganda on infant feeding should be punished as the most criminal form of sedition and these deaths should be regarded as murder”. In 1972 the International Organization of Consumer Unions (IOCU) suggested a “Code of Practice for Advertising of Infant Foods”.9

World Heath Assembly’s 1974 Resolution recommended that the general decline in breastfeeding in many parts of the world are to be taken care and urged Member States, including India, to review sales
promotion activities of baby foods and to introduce appropriate remedial measures, including advertisement codes and legislation where necessary”.9

The issue of world’s largest consumer boycott in support of Nestle was taken by the WHO and at the 31st World Health Assembly in 1978 it was recorded that the Assembly recommends that Member States give the highest priority to health of children by supporting and promoting breastfeeding. It was in 1979 that the first historical, international meeting on Infant and Young Child Feeding (IYCF) took place at the WHO office, recognized inappropriate practices as a hindrance to development. Since then a number of international and national events have taken place that support and emphasis on breastfeeding. Thereafter, in October 1979 the Joint WHO/UNICEF Committee recommended that an international code be developed to regulate unethical marketing practices.40

Afterwards in 1980’s governments throughout the world initiated national campaigns to promote breastfeeding. Early breastfeeding rates were low and the proportion of infants less than 6 months of age that are exclusively breastfed ranged from 9% to 55%.133
A global campaign by health organizations and citizen’s groups led to adoption of the International Code of Marketing of Breastmilk Substitutes by the World Health Assembly Act in 1981. The Code was intended to regulate the advertising and promotional techniques used to sell infant formula. Till date, 20 country have implemented the Code by means of law decree or other legally enforceable measures. But even in the few countries that have since incorporated the Code’s provisions into law, enforcement has been lax or non-existent. Despite the Codes’ best intentions, bottle-feeding continued to increase and breastfeeding continued to decline in 1980’s.

The Association for Consumer’s Action on Safety and Health (ACASH) was started in 1986 and played its role as a watchdog in monitorings, reporting violations of the IMS Act.

A Joint WHO/UNICEF Statement (1989) listing “Ten Steps to Successful Breastfeeding helps to determine weather services are baby friendly. It is a convenient yardstick to assess whether maternity services are protecting, promoting and supporting breastfeeding: The 11th step is the additional requirement identified in the innocent declaration i.e. BFHs abides by the international code of
Marketing of Breastmilk Substitutes and that it pays for infant formula that it may need. 99

Later in 1990, 32 Governments and 10 United National agencies developed and signed the Innocent Declaration, a unanimous agreement on the need for, and the road to, global support for breastfeeding. The Declaration endorsed health experts recommendations; children should be exclusively breastfed for the first four to six months; (now it is up to 6 months) along with complementary foods, breastmilk should be continued past the child’s second birthday.40

In September 1990, 71 heads of States and Governments agreed at the World Summit for Children on a set of goals in its plan of action, high priority should be given to recreating an environment that would enable all women to breastfeed.40

In September 1991, on the first anniversary of the World Summit for Children, there was a remarkable meeting on breastfeeding. All forces influencing breastfeeding policies and practices were represented; by governmental and non-governmental groups, consumer organizations, infant formula manufacturers, worldwide
associations of health service professionals, nurses, midwives, obstetricians, gynecologists and trainers. Hospitals and maternity centers are targeted as the critical starting place for national baby friendly initiatives, to make breastfeeding the first step in the world, that allows babies to survive and thrive.40

The Convention on the Rights of the Child entered into force in 1990; among its provisions is the legal obligation of states to provide mothers and families with the knowledge and support needed for breastfeeding.40

With world leaders committed in writing to specific goals on breastfeeding, a consortium of major international NGOs formed the world Alliance for Breastfeeding Action (WABA) in February 1991. There was a major break-through later: the International Association of Infant Food Manufactures promised to stop, both free and low cost distribution of breastmilk substitutes to hospitals and maternity centers throughout the developing world by the end of 1992.40

The BPNI (Breastfeeding Promotion Network of India) was founded in Dec 3, 1991 at Wardha, Maharashtra a registered, non profit, independent, national organization with international
collaboration. It is India’s largest network having order 2000 members working. It works towards protecting, promoting and supporting breastfeeding. To empower all women to breastfeed their infants exclusively for the first 6 months of life and to continue breastfeeding along with appropriate complementary foods up to 2 years of age and beyond is the motto of BPNI.41

Encouraged by their experience in other global child survival initiatives, UNICEF and WHO consulted their partners and selected 12 developing countries to lead the initiative and insisted that all countries should achieve baby friendly goals by the end of 1992.9

The International Paediatric Association (IPA) called for stopping free and low cost supplies of infant formula. The Infant Formula Distributors (IFD) association unanimously agreed to stop, free, low cost supply of breastmilk substitutes and infant foods to all health facilities BPNI (1992).9

During World Breastfeeding week August 1992, The Ministry of Health and Family Welfare announced an agreement with importers and distributors of infant formula, to stop distribution of all free,
subsidized breastmilk substitutes to government and private maternity clinics.\textsuperscript{9}

The annual general body meeting of IAP (Indian Academy of Pediatrics) passed a historic resolution in January 1996 to stop accepting money from the manufacturers of infant formula and related products.\textsuperscript{9}

As per the V central pay commission report (1997) Government of India issued orders to enhance maternity leave for all female central government employees to 135 days of paid leave with added provision for male government servant (including an apprentice) to have paid leave for 15 days during confinement of his wife. (BPNI WBW-2000)

Increasing maternity leave to 5 to 6 months will be a very useful measure to encourage practice of breastfeeding. Government of Haryana has already done a commendable job by doing this. In Punjab maternity leave is extendable up to 6 months.\textsuperscript{206}

The prevalence and duration of breastfeeding is very high among Scandinavian women who are given paid maternity leave for atleast 1 year.
In India, infant feeding practices are far from adequate. One of the reasons has been identified as the commercial influence of baby food manufacturers. Recognizing this, the Government of India enacted the IMS Infant Milk Substitutes Feeding Bottle and Infant Foods, (Regulation of Supplies and Distribution) Act, 1992.5

Violation of the IMS Act may lead to imprisonment for a term, which may extend upto 3 years, with fine upto Rs.5000/- or even more.

Amendment of the IMS Act was passed on 1993.5

In Finland, Monitory incentives are given following birth, parents are entitled to maternity, paternity or parents leave upto 10 months. These leaves are government funded through social insurance institutes. Allowances were given even for unemployed parents.206

Many countries have adopted the Code of marketing of IMS. IBFAN, commissioned a study to review the implementation of the code in 6 countries. The study in India, revealed that inspite of the IMS Act, baby food industries had stepped in unethical practices, misleading consumers and undermining breastfeeding in many ways,
to promote their sales. Study also revealed that awareness about the IMS Act was low among health professionals.\textsuperscript{9}

In 1998 BPNI met the Honorable Minister of Information and Broadcasting and conveyed that the T.V. Channels are violating the IMS Act, which led to the “Cable TV Networks Act and Amendment on September 2000 which included a ban on advertisement of feeding bottles and infant foods through cable services.\textsuperscript{40}

In 2003, the parliament passed the new IMS Amendment Bill 2003. In January 2005, The Government of India proposed repealing the country’s 1992, IMS Act Food Safety and Standards Bill 2005, The results might have been due to a weakening of national base on commercial promotion of products that compete with breastfeeding.\textsuperscript{9}

The BPNI organized in 2005 a campaign “Save the IMS Act” to tackle the suggested repeat against IMS Act and it was successful and Indian Government dismissed the repeat. Full backing was offered by IBFAN, WABA, ACASH, IMA, IAP, FOGSI, TWAI, UNICEF, JSA (Jan Swesthya Abhiyan) IACR The Indian Alliance for Child Rights) and VHAI (Voluntary Health Association of India).\textsuperscript{9}
Guidelines on promotion of breastfeeding should form an integral part of the child development programmes for women and children. They should be effectively operationalized through the managers and functionaries of the ongoing programmes primarily related to women and child development such as Integrated Child Development Services (ICDS), Child Survival and Safe Motherhood Programme (CSSM), Urban Basic Service for the Poor (UBSP) Development of Women and Children in Rural Areas (DWCRA), and programmes implemented by the nongovernmental organizations (NGO’s).9

**WHA Resolutions on Promotion of Breastfeeding**

WHA is taking efforts continuously for the promotion of breastfeeding. Further in the year 2005 WHA resolution underscores that that financial support and other incentives for health professionals working in infant and young child health programmes do not create conflict of interest” (IBFAN – BPNI, 2006). According to Global Strategy for Infant and Young Child Feeding **Malnutrition has been responsible, directly or indirectly for 60% of the 10.9 million deaths annually among children under five, 2.42 million of these (roughly one quarter) deaths are in India alone.** BPNI recommends that people should be fast forward furious and be flexible in the battle against violation of IMS Act. (BPNI WBW 2006).