

CHAPTER II

REVIEW OF LITERATURE

This chapter deals with literature review. A review of literature can help to clarify a problem, justify research for the proposed problem, throw light on appropriate methodology and contribute towards the development of a conceptual framework.

A review of literature provides with the current and scientific knowledge about a particular problem, and is necessary to narrow the problem to be studied, **Nieswiadomy; (2008)**.

The reviewed literature has been divided under the following headings.

1. Literature related to complementary feeding
2. Literature related to knowledge of mothers regarding complementary feeding
3. Literature related to attitude of mothers regarding complementary feeding.

Literature related to complementary feeding.

Experts at the World Health Organization/ UNICEF Technical Consultation on Infant Feeding in March 2000, reached an informal consensus that the appropriate age for introduction of complementary feeding is "about six months," **Naylor A;(2000)**.

Similarly the Global Consultation on Complementary Feeding reported and recommended by WHO 2001 on appropriate feeding practices and guidance for infants and that they should start receiving complementary foods at 6 months of age, in addition to breast milk. Initially 2-3 times a day between 6-8 months, increasing to 3-4 times daily between 9-11 months and at 12-24 months with additional nutritious snacks offered 1-2 times per day as desired. **ACC/SCN;(2004)**.

A cross-sectional study of complementary feeding practices among 200 mothers of children aged six months to two years - in coastal south India showed that complementary feeding at the recommended time of six months was significantly associated with socio-economic status ($p=0.036$), birth order ($p=0.013$), place of

delivery (0.033), maternal education ($p=0.038$) but not with gender of the child, maternal age, maternal employment status, type of family and advice about complementary feeding during immunization. Advice about breastfeeding and complementary feeding during antenatal checkups and postnatal visits might improve feeding practices. **Australas Med J.; (2011)**

Cunningham AS *et al.*; (1991), Lepage P *et al.*;(1981), Wojtyniak BA *et al.*; (1988) stated that by 8 months the child should receive complementary foods between breastfeed at least three times in a day and at least 4 times a day in the second year. Flavor, aroma, consistency and variety affect the intake of complementary foods. The prospective growth enhancing effect of breastfeeding continues into the second year. Breastfeeding should therefore be sustained in the second year but in the low socioeconomic community in developing countries, child survival may require mother's milk through the third year of life.

Rebhan B *et al.*; (2009) reported that first 9 months of life in Bavaria reveals that there was a considerable variety concerning the time when complementary feeding was introduced. Only 16.4% of the infants ate solid/semisolid food before the age of 5 months.

Fanaro S *et al.*; (2007) reveals that solid food was introduced on average, 22.2 wks after birth and 15.1 wks after term; 6.5% of infants (considering chronological age) and 60.9% (considering corrected age) were weaned before 4 months; 18% of infants weighed <5 kg at weaning. Among maternal factors, only age significantly influenced the weaning schedule. The finding reveals that a matter of concern emerging in almost 50% of cases, the first solid food offered to infants is low in energy density, and its protein, iron, and zinc content is negligible.

Beth H O *et al.*; (2010) reported perspectives of health professionals on assisting low income mothers with infant feeding. Low income mothers interact with a variety of health professionals through medical care and public health programs. The study concluded that a better understanding of health professionals' perspectives on

working with low income mothers on infant feeding will inform nutrition education for these mothers, and may also inform strategies to improve communication between mothers and health professionals, subsequently improving infant health.

M Munirul Islam, et al.; (2008) performed a study on total daily energy intakes and consumption of breast milk by healthy breastfed Bangladeshi children. The result shows the mean amounts of complementary foods consumed were inversely related to their energy density and positively related to the number of meals/d ($P < 0.001$ for both). Breast milk intake decreased slightly but progressively, with greater energy density and feeding frequency of complementary foods; total EIs (kcal/d) increased in relation to both factors ($P < 0.001$ for both).

Schiess, Sonia et al.; (2010) said, solids were introduced earlier in FF infants (median 19 weeks, interquartile range 17–21) than BF infants (median 21 weeks, interquartile range 19–24). Some 37.2% of FF infants and 17.2% of BF infants received solid foods at 4 completed months, which is earlier than recommended in Europe. Solids had been introduced at 7 completed months in 99.3% of FF infants and 97.7% of BF infants, respectively. Thus the study concluded that complementary feeding is introduced earlier than recommended in a sizeable number of infants, particularly among FF infants.

D K Taneja, J P Dadhich; (2000), highlighted that the appropriate timing for introduction of complementary food is based on theoretical calculation of energy requirements of baby and energy provision by breast milk. For infant 6-12 months of age WHO recommends 98 Kcals/kg/day. Early introduction of complementary feeding simply replaces breast milk without contributing to total energy intake and growth prevalent. These include late initiation of breast feeding which associated with practice of prelacteal feeds. This situation is attributable to ignorance, misbeliefs, cultural practices, aggressive promotion of infant milk substitutes and infant foods which undermine the confidence of mothers in adequacy of breast milk and also these being considered as status symbol.

In a cross sectional study on feeding practices of children in an Urban Slum of Chetla, Kolkata among 120 children, **Roy S *et al.*; (2009)** found that mothers of 81.6% (98/120) were literate and 69.1% (83/120) were housewives. 41.67% (50/120) of the children belonged to families whose income per month is less than Rs.500. A total of 93.33% (112/120) of the children were delivered at health facilities and the rest at home. 29.16% (35/120) received feed prelacteal in the form of water, infant milk formula, cow's milk and honey. Prelacteal feeding prevailed more among mothers who were not informed about EBF and the relationship was statistically significant. EBF was less in literate mothers and the relationship was statistically significant.

Nita Bhandari *et al.*; (1994) stated the association between diarrheal duration and nutritional decline that implications for an empirically validated definition of persistent diarrhea, that the World Health Organization regards illness due to contaminated food as one of the most widespread health problems in the contemporary world. Millions of children in the world die each year from diarrheal diseases; hundreds of millions suffer from frequent episodes of diarrhea and consequent impairment of nutritional status. To sensitize the community in a catalytic manner, health workers, community leaders and community volunteers can act as effective change agent to bring about a behavior that can lead to improvement in their real life practices, thereby reducing the prevalence of diarrheal episodes in young children.

WHO recommendations on the age at which complementary foods should be introduced are based on a consideration of the optimal duration of exclusive breast-feeding. Given that infant formula is defined by WHO as a complementary food, the issue of the optimal age for introduction of complementary foods in formula fed infants has received little attention. In early 2000 a WHO-commissioned systematic review of the optimal duration of exclusive breast-feeding. **WHO; (2004).**

Beginning at 'about six months', breastfeeding should be complemented with appropriate solid foods. Complementation and replacement of breastfeeding are two separate components of introducing complementary foods. It is important to avoid

replacement of breast milk. The additional feed should not be so much that the breast milk production is reduced. **Greiner; (1995).**

Jolly N *et al.*; (2010) in a study felt that most women knowledge about breastfeeding were covered by the peer counselors, while others expressed a desire to learn about complementary feeding and family planning. Individual peer counseling to support exclusive breastfeeding was positively received by the women.

A cross-sectional study by **S Rao *et al.*; (2011)** at two private hospitals - Dr TMA Pai Hospital Udupi and Dr TMA Pai Hospital Karkala and a public hospital, Regional Advanced Paediatric Care Centre, Mangalore, of coastal south India for a two-month period from August 2010 to October 2010. Two-hundred mothers of children between six months and two years attending the paediatric outpatient departments. Findings showed 77.5% mothers had started complementary feeding at the recommended time of six months. Only 32% of mothers were giving an adequate quantity of complementary feeds.

Cristina MGM *et al.*; (2004) revealed that 6 new knowledge acquired about child feeding over the last 20 years have led to a significant change in the current feeding recommendations for breastfed children in relation to the prior recommendations. The study concluded that adequate complementary feeding of the breastfed child is critical for the child's optimal growth and development.

K Srimathi, *et al.*; (1999) conducted a comparative study between the Anglo American and Asian Indian American mothers and found that compared to their AIA counterparts, AA mothers breast-fed for significantly longer durations and introduced formula and solid foods into the infants' diet at a later age ($p < 0.05$).

The WHO is urging countries to promote improved complementary feeding practices to ensure optimal health, growth, and development of young children. To help achieve this, a rigorous 4-phase approach for designing optimal population-specific food-based complementary feeding recommendations (CFRs) was developed. In phase I, an optimized diet is selected, using goal programming (Model #1), which

aims to provide a desired nutrient content with respect to habitual diet patterns and cost. In phase II, their success for ensuring a nutritionally adequate diet is assessed via linear programming (Model type #2) by sequentially minimizing and maximizing the level of each nutrient (i.e., worst and best-case scenarios) while respecting the CFRs. For nutrients that are <70% of desired levels, the best food sources are identified via linear programming in phase III (Model #3). Different combinations of these foods are incorporated into the original draft of the CFRs to produce alternative CFRs, which are then compared on the basis of their cost, flexibility, and "worst-case scenario" nutrient levels (Model type #2) to select, in phase IV, a final set of CFRs. Outcomes include a set of optimal, population-specific CFRs and practical information regarding key "problem nutrients" in the local diet, **Elaine L;(2006)**.

Chantelle N H, Dennis D; (2006) analyzed that maternal knowledge regarding doctors' recommendations for complementary feeding was associated with mothers who introduced solids ($r = 0.25, p < .05$), cow's milk ($r = 0.35, p < .05$), juice ($r = 0.42, p < .001$) and water ($r = 0.38, p < .001$). Maternal nutrient knowledge was associated with when cow's milk ($r = 0.37, p < .05$) and fruit drink/soda ($r = 0.52, p < .01$) were introduced. The quality of maternal problem-solving was associated with when mothers introduced fruit drink/soda ($r = 0.34, p < .05$). Results underscore the role that healthcare professionals play in complementary feeding.

By the age of six months the gastrointestinal functions are adequate to deal with the weaning foods while the kidneys can easily handle the solute load especially under conditions of low fluid intake. Mashed and chopped foods are acceptable between 7 and 12 months while family foods are acceptable usually after 12 months of age. The complementary foods should be prepared fresh from the usual home foods, **IAP;(1995)**.

James KF et al.; (2010) surveyed mothers with infants aged 3 to 12 months. The results showed that at 3 months of age, 83% of infants were already consuming infant cereals. All mean nutrient intakes, except vitamin D and iron, met CF recommendations at seven to 12 months. The study concluded that complementary

foods were introduced earlier than recommended. Although mean nutrient intakes from CF at six to 12 months appear to be adequate among Canadian infants, further attention to iron and vitamin D intakes and sources may be warranted.

Chessa K. *et al.*; (2003) proposed nutrient composition for fortified complementary foods recommended nutrient requirements, contribution of human milk to these requirements, macronutrient interactions, compound bioavailability, methods of production and overage. The proposed fortification levels are based on a daily ration size of 40 g for infant aged 6–12 months and 60 g for children aged 12–23 months. A desired protein–energy ratio of 6–10% is used to estimate energy from protein. The desired percentage of energy from lipid is estimated at 24% for infants aged 6–11 months and 28% for children aged 12–23 months, with the remaining energy to be supplied from carbohydrate.

Singh P K; *et al.*; (2005) in an evaluative study short-termed the effect of frequency of complementary feeding in breast fed infants. The findings reveal that there was no difference in the total caloric consumption with a semisolid feeding frequency of three or four times per day. The frequency of feeding and the breast feeding duration were also comparable ($P > 0.05$). The time required for feeding was higher (mean difference 14.75 min; $P < 0.001$), whereas the per milk intake of semisolids was lower with four semisolid feeds per day; (mean difference -5.5 kcal/meal; [95% CI -10.19 to 0.81]; $P = 0.024$).

Igah, S.A; (2008) highlighted while advocating that breast-feeding be sustained during weaning periods, it also articulates the decision, which guides when to introduce semi-solid foods to infants. Conclusively, complementary and supplementary foods are as important as weaning period is critical to the survival of infants. Therefore, weaning must not be done inappropriately but implemented as a smooth transitional dietary experience of infants, which takes them successfully through breast-feeding to the family's diet.

N. Srivastava, A Sandhu; (2006) conducted a study on infant and child feeding index traditional indicators of child feeding practices that are widely used and appear to be useful, although the validity and reliability of those related to complementary feeding have not been established. The main advantage of creating a composite index is that it allows construction of one variable representing various dimensions of feeding or care practices. This variable, in turn, can be used to illustrate graphically the importance of child feeding or care for child outcomes or to model their determinants. This can be invaluable for advocacy, apart from being an indispensable tool for the purposes of research, monitoring and evaluation.

Nita B *et al.*; (2004) revealed in a cluster randomized controlled trial that complementary feeding practices are often inadequate in developing countries, resulting in a significant nutritional decline between 6 and 18 months of age. The effect was greater in the subgroup of male infants (difference in mean length gain 0.51 cm, 95% CI 0.03, 0.98). Energy intakes from complementary foods overall were significantly higher in the intervention group children at 9 months (mean \pm SD: 1556 \pm 1109 vs. 1025 \pm 866 kJ; $P < 0.001$) and 18 mo (3807 \pm 1527 vs. 2577 \pm 1058 kJ; $P < 0.001$). Improving complementary feeding practices through existing services is feasible but the effect on physical growth is limited.

Nancy F Krebs *et al.*; (2011) conducted a study on complementary feeding: a Global Network cluster randomized controlled trial. A cluster randomized efficacy trial was designed to test the hypothesis that 12 months of daily intake of beef added as a complementary food would result in greater linear growth velocity than a micronutrient fortified equi-caloric rice-soya cereal supplement. Outcome measures, obtained at 6, 9, 12, and 18 months by a separate assessment team, included anthropometry; dietary variety and diversity scores; biomarkers of iron, zinc and Vitamin B₁₂ status (18 months); neurocognitive development (12 and 18 months); and incidence of infectious morbidity throughout the trial.

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A prospective feeding practice study of 179 healthy infants in Brazil revealed that 50.3% of the infants were no longer being exclusively breastfed. Of these, 12.0 and 6.7% among the infants younger and older than 6 months, respectively, were fed with infant formulae instead of breast milk. Therefore, most infants received whole cow's milk. Infant formula dilution was correct in only 23.8 and 34.7% of the infants younger and older than 6 months old, respectively. With regards to complementary feeding, we found that the median age was 4 months for its introduction and 5.5 months for the introduction of family diet. There was high quantitative inappropriateness of micronutrient intake for infants between 6 and 12 months old who were not exclusively breastfed, mainly in terms of zinc (75%) and iron (45%). It showed high frequency of inappropriate feeding practices and dietary intake in very young infants. These practices may lead to an increased risk of development of chronic diseases in the future **Michelle Cavalcante Caetano;(2010)**.

Literature related to knowledge of mothers regarding complementary feeding.

Laanterä S, et al.; (2010) assessed the knowledge on breastfeeding where the respondents correctly answered 68% of the items related to breastfeeding knowledge. The most usual lack of knowledge concerned how to increase lactation, sufficiency of breast milk in hot weather, sufficiency of breast milk for 4 months after birth, and the need to pump the breasts after alcohol consumption. It was concluded that parents need more information about ways to increase lactation and reasons to start complementary feeding.

Knowledge of 168 mothers at Pokhara municipality area regarding 'Infant feeding practices' was assessed by **Subba SH, et al.; (2007)**. The findings revealed that 99.4% (167) mothers breast fed their babies and only 43.5% of the mothers

initiated breast feeding within one hour of birth and 60.5% were practicing exclusive breastfeeding at 5 months. Almost 40% of the mothers started complementary feeding before the recommended age of 6 months and 22.5 % delayed introduction of complementary feeding beyond the recommended age.

Bhatia R, Jain U; (2015)In a semi-structured survey on 100 mothers attending the pediatric OPD of a private medical college showed that early feed (< 2 hours after birth) was just 4%. The commonest pre lacteal feed given was honey (33%) – another being sugar water (4%). Within starting 6 months, 31% mothers had given breast milk along with extraneous milk, while 2% mothers were giving only extraneous milk. 32 % mothers were giving complementary food < 3 times, while 12% were giving > 6 times. As complementary food, biscuit (32%) was nearly as popular as daliya (32%) or banana (31%). 12% mothers introduced complementary feeding before 6 months while another 14% didn't start it even after 6 months. The commonest complementary food used was infant formula (62%), followed by dal paani (52%). 37% mothers agreed to having given pre lacteal feeds. It concluded that awareness needs to be generated regarding the importance of exclusive breast feeding, avoidance of pre lacteal feeds and the benefits of timely and appropriate complementary feeding.

Rana Firdouse et al.; (2008) in a cross sectional study selected 100 Females with at least one infant by Systematic random Sampling & their Knowledge, Attitude and practices regarding Breast Feeding & weaning were assessed through a pre designed questionnaire, by taking personal interviews. Statistical analysis revealed that 46% were illiterate and 54% were Educated. Early initiation of Breast Feeding was practiced by only 36% subjects, whereas 47% had knowledge about it. Mothers having correct knowledge about continued duration of Breast Feeding up to 2 years were 38% and a statistically significant difference was noticed among illiterates & educated ($\chi^2 = 5.131$, $P < 0.05$) only 13% subjects knew about the Benefits of Breast Feeding to mothers and 9% preferred Bottle Feeding. Many (60%) practiced colostrums Feeding & 46% gave pre lacteal feeds. Only 43% mothers practiced Exclusive Breast Feeding (EBF). Majority (62%) knew that weaning should be initiated by 4-6 months of age but

only 35% mother initiated it by the correct age of 6 months. Only 18% knew about the harmful effects of delayed weaning. 81% mothers preferred liquid foods for weaning and a statistically significant difference was found among illiterates & educated ($\chi^2 = 4.747$, $P < 0.05$). 85% agreed to solid food by 1 year of age. It concluded all mothers should be educated about Basic principles of Breast Feeding & weaning during antenatal period.

Li L, et al.;(1998), investigated on 251 mothers of infants aged 6-12 months in urban areas of Beijing, China found that maternal education level (OR = 2.44, 95% CI: 1.42–4.19, $P < 0.05$), employment (OR = 2.05, 95% CI: 1.13–3.74, $P < 0.05$) and antenatal nonexclusive breast-feeding plans (OR = 4.10, 95% CI: 2.24–7.50, $P < 0.001$) were found to be correlated to inappropriate feeding practices. It concluded that feeding practices for most of the urban infants were in accordance with the Chinese government and WHO recommendations.

AK Hussein; (2005) revealed on a study of breastfeeding and complementary feeding practices in Tanzania that median duration of breastfeeding for children below 36 months of age (20.9%) and percentage of breastfed babies $7 \leq 10$ months who received complementary foods in the last 24 hours (90.7%). Further the study recommended strong advocacy on the importance of optimal breastfeeding and complementary feeding practices, and raising awareness of working mothers on their entitlement to paid breastfeeding breaks during working hours.

A study on Maternal education and complementary feeding by **Perveen L et al.;** (2006) showed positive relationship between the nutritional status of infants and educational status of mothers ($P < 0.001$). Similar relationship was observed between the educational status of respondents and the introduction of complementary foods at an appropriate age (six months) of infants ($P < 0.001$).

Chauhan M et al.; (2007) revealed that 30.9 % infants were not receiving CF and 21.9% mothers initiated CF at the right age. This was significantly associated with the literacy status of the mothers ($p < 0.05$). 81.1% infants were receiving family pot

feeding. The CF fed to the infants were mostly (88.6%) of semi-solid consistency. Demand feeding was being practiced by 66.7 % mothers. The practice of cleaning hands before feeding was very poor with only 17.1%.

While, **Aggarwal *et al.*; (2008)** investigated on the practice of complementary feeding (CF) in infants 6 months to 2 years, knowledge of mothers regarding CF and reasons for inappropriate CF practices among 200 children by applying semi-structured questionnaire. Knowledge regarding appropriate timing and consistency varied significantly with maternal education and paternal education (Chisquare $P < 0.05$). On multiple logistic regression only maternal education of graduate level correlated with knowledge of timing of CF ($P = 0.089$, OR-3.5, CI 0.826–15.2). Most common reason for inappropriate practice in 154 mothers who delayed feeds was “tried but did not eat, vomits everything” (52%). It concluded that CF practices were inappropriate and knowledge inadequate in majority of the children studied.

In a research among 500 mothers of Pakistani infants on the “association between complementary feeding practice and mother’s education status in Islamabad **Liaqat P, *et al.*; (2007)** found positive relationship between the nutritional status of infants and educational status of mothers ($P < 0.001$). A similar relationship was observed between the educational status of respondents and the introduction of complementary foods at an appropriate age (6 months) of infants ($P < 0.001$).

R Rama *et al.*; (2006) in a study on breast feeding practices in the rural community of West Bengal showed that 85.5% of the mothers initiated breast feeding within 7-18 hours after delivery, 55% of mother got information about breast feeding from their family members. Education and socio-economic status had a significant association with duration of breast feeding. Babies of both the bottle feeding and complementary feeding groups had significantly higher average number of episodes of diarrhea than those exclusively breastfed children.

Cape W *et al.*; (2007) showed that breastfeeding had been initiated in the case of 96% of the infants. Milk feeds at the time of the survey included breast milk alone

(58%), breast milk plus bottle feeds (23%), and bottle feeds alone (18%). Formula feeds were either dilute (54%) or concentrated (14%). First solid foods given were maize meal porridge (55%), infant cereals (32%), and ready-to-eat bottled baby foods (9%). Biochemical data showed that 20% of infants had serum retinol levels < 20 [micro]g/dl, 67% had serum ferritin levels < 12 [micro]g/l, 49% had haemoglobin levels < 11 g/dl, and 32% had serum zinc levels < 60 [micro]g/dl. Anthropometric data showed that 16% were stunted and 6% were underweight.

R O Abidoye et al.; (2000) did a comparative study on weaning practices and growth pattern in 3–24 months old infants fed formula and food in Nitel Health Centers and PHC's of Mushin Local Government area of Lagos, Nigeria emphasized the need to deal with nutritional problems in the country. Mothers should be educated on the appropriate feeds for each stage in the growth of the infant and the appropriate time for introduction of such foods.

Similarly a survey conducted by **Guldanet al.; (1993)** on 185 infants (4-21 months of age) belonging to rural Bangladesh found that education of mothers had a significant effect on child care and feeding behaviours. In developing countries breast-feeding is common, but complementary foods are frequently introduced at an early stage before the age of six months.

R Kruger, GJ Gericke; (2003) highlighted that breast-feeding was the choice feed and bottle-feeding was only given when breast-feeding was impossible. Solid food was introduced early (at 2–3 months) and a mixed family diet at 7–9 months. Milk feeds were stopped completely from 18–24 months. The women adhered to their cultural beliefs regarding food choices and preparation practices. The study revealed that inadequate nutrition knowledge and adherence to cultural practices lead to poor-quality feeding practices.

To facilitate optimal growth of newborns, many countries have developed infant feeding recommendations, usually suggesting 4–6 months of exclusive breastfeeding and then the gradual introduction of complementary foods.

Complementary foods and family foods were introduced at median ages of 2.5 and 6.3 months, i.e. much earlier than recommended. Exclusive breastfeeding is uncommon and complementary foods were introduced early to newborns among these rural families, **M Vaahtera et al.; (2007)**.

S Malla, SM Shrestha;(2004) indicated 92% households were found practicing traditionally complementary feeding practices (TCFP), 8 %t households were found practicing commercial complementary feeding practice (CCFP). Traditional foods fed children were found more severely malnourished compared to commercial complementary food fed, which clearly indicated that complementary feeding practices have direct impact on nutritional status of young children.

Kulkarni RN et al.; (2004) observed that 29.16% received prelacteal feed in an urban slum of Mumbai and the result of prelacteal feeding was about 36.1% ⁷⁰, while in a Chandigarh slum, it was to the extent of 40% (2006).

B F Kalanda et al.:(2006) conducted a study to compare growth, morbidity incidence and risk factors for under nutrition between infants receiving complementary feeding early, before 3 months of age, with those receiving complementary foods after 3 months in a poor rural Malawian community. The result revealed mean age at introduction of water was 2.5 months (range 0–11.8), complementary foods 3.4 months (range, 1.0–10.7) and solids 4.5 months (range 1.2–13.8). Over 40% of infants had received complementary foods by 2 months and 65% by 3 months. The proportion of exclusively breast-fed infants, which included those receiving supplemental water, was 13% at 4 months, 6.3% at 5 months and 1.5% at 6 months. Infants with early complementary feeding had lower weight for age at 3 and 6 months ($P<0.05$), and at 9 months ($P=0.07$) and at 2 months they were approximately 200 g lighter. Early complementary feeding was significantly associated with increased risk for respiratory infection ($P<0.05$).

A cross-sectional analytical study design and was carried out at the Kebele in Jigjiga town among the randomly sampled 110 mothers and their children. A

researcher-administered questionnaire was used to collect data. The respondents were mostly young (mean age 27.7 ± 4.7 years), married (87.3%), housewives (70%) with mainly primary school level of education (48.2%). The main sources of income for most households were business (48.6%) and casual labor (31.8%). Mothers had high knowledge on complementary feeding practice (90%) out of the 20 knowledge questions. All (100%) the children aged 6-8 had been introduced to solids, semi-solids and soft foods. Maternal knowledge on complementary feeding was significantly associated with nutritional status of their children. Mothers knowledge on complementary feeding practices was not significantly related to her complementary feeding practices ($p>0.05$), **Global Journal of Nutrition & Food Science; (2018)**.

Christina A. Nti*; (2011) conducted a study in Ghana involving one hundred mothers with young children between the ages of 6 and 18 months using a combination of methods. About 16% of the study children were underweight while 8% were both stunted and wasted. The mean dietary diversity score was 4.6. Significant differences were observed between dietary diversity groupings and energy/nutrient intakes of the children. Dietary diversity was significantly associated with weight-for-age, length-for-age and weight-for-length. As dietary diversity increased, child nutritional status also improved. It is concluded that high dietary diversity improves energy and nutrient intakes, child growth and nutrition.

A descriptive, cross-sectional study was conducted to assess the mother's knowledge and practice of complementary feeding from 28 locations cities, towns and villages across Kosovo. The sample of 492 mothers with infant between 6-24 months, with a confidence level of 95%, acceptable margin of 5%, the expected prevalence of knowledge 50% and effect of 1.3, were interviewed from all regions. Mother's knowledge shows significant distinction according to higher level of education regarding perceptions that complementary feeding is the act of giving foods and liquids other than breast milk to the infants (96%), complementary food should be given to the infants after 6 months (61.9% both high school and university) and food

supplementary vitamins should always be given to children 6-24 months if he or she shows signs of malnutrition (90.5%),**Med Arch; (2017).**

Kumudha Aruldaet al.;(2010)in a formative study in rural Uttar Pradesh shows that among children aged 6-23 months (N=2,386), only 24 percent were given appropriate complementary food, an increase of just 2 percent points since 2005-06 (NFHS-3).³ Appropriate complementary feeding, measured by the type of food and frequency of feeds given, was low across all age groups. Only 13 percent of children were started on complementary food at the correct age of 6 months. While in most cases (46 percent) complementary feeding was initiated between 7-9 months of age, 17percent were started on complementary feeding much later, after the age of 10 months. Finding shows that 11 percent of children, mainly in the age group 6-8 months, had not been given any complementary food. The practice of initiating complementary feeding at 6 months of age was relatively higher in the Eastern region (18 percent) as compared to the Western (12 percent) and Central regions (10 percent). Complementary feeding findings show that 63 percent of children aged 6-23 months were given the minimum recommended number of feeds in a day. It reveals that only 30 percent were fed at least three types of food as recommended. In most cases, the food given was cereal based (85 percent), followed by vegetables and fruits (45 percent).

A cross-sectional study in rural areas of Navsari district, Gujarat, included 243 women, who had one child aged 12 to 23 months preceding data collection. Only 56.4 % of mothers initiated breastfeeding within one hour; 36.2 % of infants were exclusively breastfed for 6 months and 97.5 %had received complementary feeding at 6–9 months of age. There was 11.5% prevalence of underweight, 15.6% prevalence of stunting and 8.6% prevalence of wasting. There was significant association between time of initiation of breast-feeding with the birth order of the child and type of delivery. Efforts are needed to promote early initiation of breastfeeding, exclusive breastfeeding for 6 months and age-appropriate complementary feeding among infants,**Shreyash J Gandhiet al.;**(2014)

Hasnain Set al.; (2013) in a cross – sectional study was conducted in Pediatrics OPD Jinnah Hospital Lahore on 250 mothers of the babies aged 6 – 12 months were selected by non-probability purposive sampling technique. Their knowledge and practices regarding complementary feeding was assessed by using a close ended pre-tested questionnaire. About 79.6% mothers exclusively breastfed their babies and 84% continued breastfeeding along with complementary feeding. The correct knowledge of initiation of complementary feeding was found in 54% of mothers but it was practiced by only 43%. The overall knowledge of 24% mothers was good and 28% had poor knowledge of complementary feeding whereas only 7% women had good overall practices. There is statistically significant association of education of the parents with the practices of complementary feeding (p-value = 0.012 and 0.0295 of mothers and fathers). Occupation of the mothers and type of family had also shown statistically significant association (pvalue = 0.018 and 0.001 respectively) with the overall practices about complementary feeding. It was concluded that more than one third of mothers had poor overall knowledge regarding complementary feeding and a very few mothers had good overall practices. Education of parents, occupation of mothers and type of family had statistically significant association with complementary feeding.

Literature related to attitude of mothers regarding complementary feeding.

Mothers choose to wean their infants for a variety of reasons including traditional beliefs, nutritional status of the infant, new pregnancy or onset of illness. When weaned too early, there is a possibility the infant cannot ingest enough food to attain adequate macro and micronutrients which can lead to under nutrition, failure to thrive and death (**WHO, 2002**). When weaned too late, breast milk may delay consumption of foods that are more nutritionally appropriate for the infant's need and may also result in poor nutritional status (**Brown & Dewey,1998**). WHO and UNICEF recommend weaning 12 infants at two years of age or older based upon studies that indicate breast milk is not an adequate source of nutrition beyond this age and that

prolonged breastfeeding can reduce total food intake and thus predispose to malnutrition,WHO;(2001).

D Anjalin, et al.; (2009) in a study on effectiveness of planned teaching programme on knowledge and attitude about complementary feeding among mothers of infants showed that most of the mothers were in the age group of 22-24 years (44%) and most of them (48%) were primi mothers. Majority of the mothers were from joint families (80%), 70 % belonged to lower socio-economic status, and 76 % of mothers got information about complementary feeding from their mothers.

Ann-CathrineBramhagenet al.; (2006) interviewed 18 mothers concerning complementary feeding experiences and identified 2 major categories of mothers' attitudes in feeding situations – a flexible attitude and a controlling attitude. Flexible attitude mothers' were sensitive to the child's signals and responded to them in order to obtain good communication. Mothers who expressed a need for control established rules and routines regarding the feeding situations.

A cross-sectional study of 126 caregivers was taken to assess the dietary practices of ill children using an open-ended pretested questionnaire. Statistical package for social sciences software was used for data analysis. Simple proportions, percentages and Chi-square were used. It was believed that a child must be fed less during illness. Educational status did not play a role in maintaining beliefs, but elders and religion did,Asha D Benakappa; (2012).

NorhanZeki Shaker et al.; (2009) surveyed the knowledge, attitude and practices of mothers on child feeding. The results showed that mothers have efficient practices and attitudes toward breast, formula and complementary feeding. It was concluded that majority of infant and young child's feeding pattern was mixture feeding, or mixture and complementary feeding. The study recommended to revitalizing and expands the Baby-friendly Hospital Initiative and establishing of breastfeeding intervention programs for protection, promotion, and support of breastfeeding.

An investigative study by **B.O. Ogunba, (2006)** regarding breast-feeding, complementary feeding and attitude towards child feeding of 384 women with children between the ages of 0-24 months in Osun State revealed: only 24% of the women practiced exclusive breast feeding and majority (48.8%) terminate breast feeding at age 12 months. Children were fed only when they are hungry (49.9%) and 89.2% used feeding bottle for feeding. (81.3%) of the women have indifferent attitude towards the feeding of their children. Mothers with favourable attitude were only 20% and 3.5% had unfavourable attitude. It recommended that mothers should be intimated with recommended feeding practices and be encouraged to adopt optimal nutrition for under-five children.

SN Okoloet al.; (1999) investigated on knowledge, attitude and practices regarding breastfeeding in five rural communities in Toto Local Government in Nassarawa State, Nigeria on 310 mothers through questionnaire. One hundred and sixty-two (52.3%) mothers were illiterate while 148 (47.7 %) had either primary or secondary school education. Giving babies colostrum, was seen more amongst mothers with higher levels of education ($p < 0.001$).

Rana Firdouse; (2009) conducted a cross sectional study in Karimnagar district (AP). 100 Females with at least one infant were selected by Systematic random Sampling & their Knowledge, Attitude and practices regarding Breast Feeding & weaning were assessed through a pre designed questionnaire. Statistical analysis showed 46% were illiterate and remaining 54% were educated. Majority of the subjects (62%) knew that weaning should be initiated by 4-6 months of age but only 35% mother initiated it by the correct age of 6 months. Mothers education about Basic principles of Breast Feeding & weaning during antenatal period is very important, it concluded.

Studies by the Nutrition Foundation of India (NFI) in urban slums of three major cities (Mumbai, Kolkata, and Chennai) documented that exclusive breastfeeding was practiced in only 30–40% of infants, colostrum was discarded in up to 90%, use of

prelacteal feeds was almost universal, use of feeding bottles, animal milk, and commercial milk formulae was very common. Also it was found that the introduction of complementary foods is markedly delayed and the foods lack the consistency, energy density and are feeding inadequate amounts and in unhygienic ways,**Ghosh S; (2004).**

Similarly, a descriptive study by **YasmeenMemonet al.;(2001)** on 100 mothers of infants stated that 71% of mothers discarded colostrums. The frequency of breast-feeding was high initially but due to variety of socio-cultural reasons, it declined rapidly with early supplementation of bottle feeding. Pre-lacteal feeding was a major reason for breast feeding delay. Inadequate weaning in terms of quality and quantity was observed common. Cultural beliefs and taboos were affecting the weaning in majority of the cases. Therefore, a need to educate the mothers about correct feeding practices so that healthy growth of the infants can be maintained.

Malnutrition is responsible globally for 60% of deaths among children under 5 years and is often attributed to suboptimal feeding practices The World Health Organization recommends exclusive breast-feeding for the first 6 months of life. In this cross-sectional study 374 children between the ages of 6 and 23 months was conducted and Knowledge and behavior of mothers regarding introduction of water and CFs were assessed. Water was introduced to about 85% of the children in the first 3 months of life and 62% were fed CFs before 6 months. Overall, 16% had clinically significant wasting (weight-for-length Z-score (WHZ) less than -2) and 20% had stunting (height-for-age Z-score (HAZ) less than -2). The results suggest that early introduction of water and CFs is frequent and is not associated with increased risk for malnutrition among children,**Gupta N et al.;(2007)**

MallaSa and ShresthaSMb; (2004) interviewed mothers of 0-24 months old children with a set of questionnaires and Anthropometric assessment, focus group discussion, twenty-four hours dietary recalls, nutrient analysis of the complementary foods and market survey were adopted as a research methodology for data collection. Finding of the study indicated that traditional about 92 percent households were found

practicing traditionally complementary feeding practices (TCFP) were 8 percent households were found practicing commercial Complementary Feeding Practicing (CCFP). The study clearly indicated that complementary feeding practices have direct impact on nutritional status of young children.

N M El Nour; (1992) selected 50 mothers aged 15-40 of mean age 24 years from Shoubramant village participated in a study to assess the effect of teaching about weaning. 76% of mothers and 54% of fathers were illiterate. The mothers were interviewed at baseline on their weaning knowledge and practice, and then re-interviewed after having been taught relevant information by community nursing students. Mothers' weaning-related knowledge, attitude, and practice were significantly improved by the nutrition education intervention. Mothers' level of education was found to be an important factor affecting knowledge, attitude, and practice.

Merita Berisha et al.; (2017) in a cross sectional study assessed knowledge, attitudes and practices regarding complementary feeding among 492 mothers with children between 6-24 months at the national level with a confidence level of 95%, the acceptable margin of 5%, the expected prevalence of 50% knowledge and effect of 1.3, were interviewed from all regions, in all Kosovo. Overall, 88.4% of respondents had good knowledge of complementary feeding, while only 38.4% of mothers had good practices regarding time for starting complementary feeding. There was association between maternal knowledge and level of education for complementary feeding.

Summary:

This chapter dealt with the review of literature in four areas that is review related to breast feeding, literature related to complementary feeding, literature related to principles of complementary feeding and literature related to knowledge of urban and rural mothers regarding complementary feeding.