

**PJN**

ISSN 1680-5194

PAKISTAN JOURNAL OF  
**NUTRITION**

**ANSI***net*

308 Lasani Town, Sargodha Road, Faisalabad - Pakistan  
Mob: +92 300 3008585, Fax: +92 41 8815544  
E-mail: [editorpjn@gmail.com](mailto:editorpjn@gmail.com)

## Factors Associated with Breast feeding as Well as the Nutritional Status of Infants (0-12) Months: An Epidemiological Study in Yaounde, Cameroon

Kengne Nouemsi Anne Pascale, Ngondi Judith Laure and Oben Julius Enyong  
Laboratory of Nutrition and Nutritional Biochemistry, Department of Biochemistry,  
University of Yaounde I, P.O. Box 8418, Yaounde, Cameroon

**Abstract:** Breast feeding is highly recommended as the mode of nutrition of choice for newborn babies as well as infants. This study investigated some of the factors that affect Breast feeding, and how these factors consequently affect the nutritional status of children between the ages of 0 and 1 year. One hundred and seventy one mothers were randomly selected and interviewed in the course of an immunization campaign. After interviewing, anthropometric measures for the infants were collected. Ninety eight percent of mothers breast fed their children (26% exclusively on breast milk, 72% in combination with other foods-complementary feeding); the 2% of mothers who did not breast-feed their children, cited lack of milk flow or the infant's refusal to suckle as the main reason. Malnutrition was observed in 18.525 of children on complementary feeding, compared to 14.61% in breast fed infants. Malnutrition was related to the other's age, level of literacy, knowledge of nutrition as well as working status. The length of time for which the mother breast fed was significantly related ( $P < 0.01$ ) to mother's working status as well as level of literacy, while the mode of feeding of choice was associated ( $P < 0.01$ ) to mother's nutritional knowledge.

**Key words:** Malnutrition, nutritional status, breast feeding

### Introduction

Appropriate feeding practices are extremely important for the growth and development of the child. These practices are age specific, with the proper adhesion to the age brackets for feeding recommended. From birth to the age of six months, exclusive breast feeding is recommended, and constitutes appropriate feeding for the infant (Kramer and Kakuma, 2004). The composition of breast milk undergoes changes in quality to meet the nutritional and immunological needs of the baby at different stages of child growth (Monika *et al.*, 2004). The introduction of breast milk is especially encouraged immediately after birth and up until the third day, when the mother secretes colostrum. Colostrum provides all the nutrients that are needed by the infant in this early period. It is compositionally distinct, with the concentrations of protein, vitamin A and B12 being higher than in mature milk. Colostrum also contains a high concentration of immunoglobulins, especially immunoglobulin A (IgA) which has a protective role against viral and bacterial pathogens in the gut. Although anti-infective agents continue to be present in mature human milk, it is not at the same concentration as in the colostrum.

After six months, the frequency of feeding as well as the quality of complementary feeding is of importance (Ruel and Menon, 2002). Complementary feeding starts when breast milk alone cannot meet the child's nutritional needs, and other foods and liquids are needed in addition to breast milk. The introduction of complementary foods is a critical step in the life of the

infant, and current recommendation regarding the introduction of solid food is that it should be after between four and six months of age. These recommendations are due to concerns over infant food sensitivities to growth and development. Observational studies support the finding that early introduction of solid foods may result in a heavier child (Metha *et al.*, 1998). Some researchers have suggested the introduction before 2 to 3 months or later than 6 months, both of which have more risks than benefits (Schmitz and McNeish, 1998). Based on the results published by Unicef in 1998, breast-feeding prevalence was 67% and the rate of malnourished breast fed infants was 30%. As well as Breast feeding, other non-nutritional factors may influence the nutritional status of infants. For these reasons, we studied the impact of feeding and non-feeding factors influencing the nutritional status of infants in Cameroon.

### Materials and Methods

Infants (171) aged from 0 to 1 year were randomly selected for this study during a vaccination campaign from two separate child and mother health welfare centres of Yaoundé, Cameroon, between the months of March and May 2004. The infants were divided into the following three groups based on their ages: Group I: 0 to 2.9 months; Group II: 3 to 6 months, Group III: 9 to 12 months.

The mothers were classed in groups based on their ages (15-25; 25-35; 35-45 years). The mothers' consent was sought and obtained after the aims and objectives

of the study had been clearly explained to them. Anthropometric measurements of the infants were taken, and using age, weight (WA) index, the nutritional status was evaluated using the Ong *et al.* (2005) standard. The overall acceptance of mothers to take part in the study was 91.5%.

Information on breast feeding practices as well as the mother's age, level of education, profession, marital status and nutritional knowledge were obtained from an administered questionnaire.

Data were treated statistically using ANOVA test according to the case of SPSS for Windows 10.1.

## Results

### Nutritional Status in the different age groups of infants:

Results suggest that in group 1 we have 37.28%, 29.94% in Group 2 and 32.78% in Group 3. Based on the age for weight measurement, 13.75%, 11.35% and 23.91 % of the infants were malnourished in Groups I, II and III respectively (Fig. 1). There were however some overweight infants in the various groups.

### Relation between mode of feeding and infants nutritional status:

Only 4 mothers used complete replacement feeding. For this reason, they were removed from the study. Malnutrition was observed in 14.61% and 18.52%, respectively for breast-fed and mixed fed infants. It was also observed that cases of over nourished infants were high amongst the mixed-fed ( 48,18%) compared with breast-fed (33,71%) infants (Fig. 2).

### Relation between infant nutritional status and the mother's age:

Mother's ages varied from 17 to 42 years, with 3.82% being below 20 years old, 73.22% between 20 and 29 years, and 22.95% between 30 to 42 years old. The highest incidence of mild malnutrition (9.09%) was in children of mothers aged between 35 and 45 years, and moderate malnutrition in mothers in the 15-25 years group (28.57 %). The highest incidence of over nourished infants was for mothers in 25-35 years bracket (Fig. 5).

### Relation between infant's nutritional status and the mother's profession:

The proportion of jobless housewives was 57.3%, while 42.7% had jobs. The results showed no significant influence of this parameter on the infants' nutritional status (Fig. 6).

### Relation between the length of Breast feeding and profession:

Profession is significantly correlated with the length of Breast feeding ( $p < 0.01$ ), with housewives having the longest time of Breast feeding (Fig. 3).

### Length of Breast feeding in relation to the mothers' age and level of education:

The length of breast feeding varies among the various age groups. The majority of

mothers below 19 years, weaned their babies between 6th to 8th months, although 30% of them weaned their babies before the sixth month. It was noticed that in other age groups the proportion of mothers weaning their babies between 9th and 12th months increased with the mother's age, meanwhile the proportion of those weaning their babies after 12 month was decreased. Based on the level of education, the length of Breast feeding was inverse and significantly correlated ( $P < 0.01$ ) to the mothers literacy status. The proportion of mothers who weaned their babies between the 9th and the 12th month increased in mothers whose level of education was from the primary to the secondary before dropping . In effect the proportion of mothers who weaned their babies after the 12th month decreased gradually as the level of education was increased (Fig. 4).

### Relation between nutritional knowledge and mode of feeding:

The mothers' nutritional knowledge was highly correlated ( $p < 0.01$ ) the mode of feeding. Mothers who were knowledgeable in nutritional issues, exclusively breast-feed their children until 4 to 6 months, however the nutritional status of the infants were not significantly affected by mothers nutritional knowledge (Fig. 7)

### Food consumption and food supplements used:

We noticed that infants who were exclusively breast fed sucked the milk 'on demand', while those on mixed feeding received 2 to 4 breast meals per day regularly scheduled between the morning and the evening. Between breast meals, the children were fed with a variety of baby foods of the mother's choice. We thus observed that more than 50% of babies received artificial food as well as maize porridge supplemented with 15% groundnut, 30% soybeans and 30% artificial milk. Other food supplements used were yoghurt, mashed potatoes, and adult food at almost the same proportion

## Discussion

Mixed feeding (MF) was practiced by 72% of the mothers, exclusive Breast feeding (BFO) by 26% and exclusive bottle feeding (BF) by 2.18%. When infants were classified based on the mode of breast-feeding, of those who were mixed fed, 3.78% presented moderated malnutrition, while 12.12% presented mild malnutrition. In contrast the proportion of malnutrition among BFO was 25 and 6.6% respectively. About 44% of infants on MF and 40% of infants on BFO had a good nutritional status.

We notice however that the proportion of exclusively breast fed infants (0-3 months) was low (26.01%). This confirms the observed drop in the practice of exclusive breast-feeding in industrialized countries and in urban areas of developing countries, despite the known advantages of Breast feeding, which has reduced infant

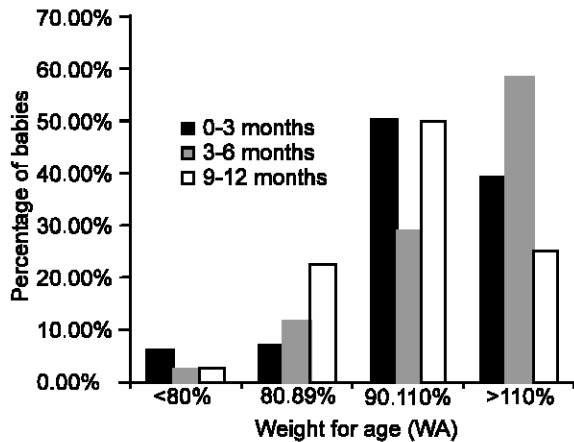


Fig. 1: Nutritional status in the different age groups

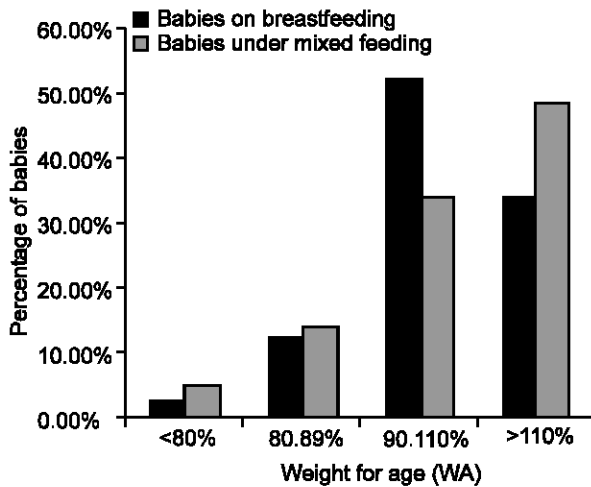


Fig. 2: Effect of different feeding patterns on nutritional status

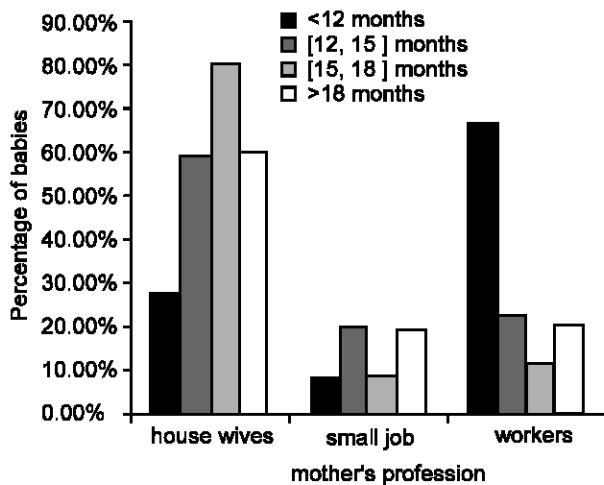


Fig. 3: Effect of mother's profession on breast-feeding duration

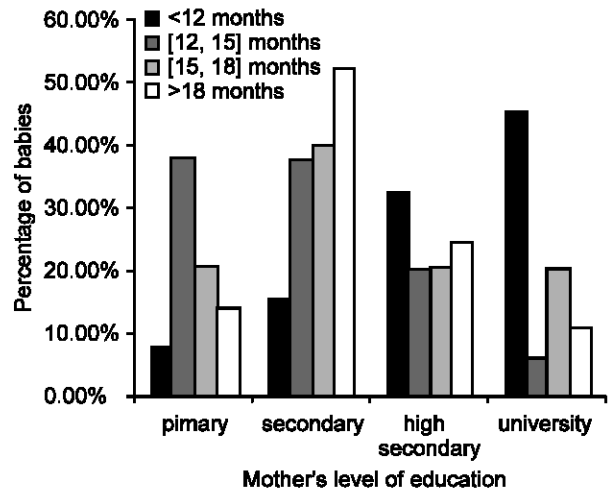


Fig. 4: Effect of mother's literacy on breast-feeding duration

mortality and morbidity in many countries (Monika *et al.*, 2004). The fact that the mother's age influenced the nutritional status of the child could be due to the low level of awareness usually encountered with young mothers, who usually have little time to care for their children. In contrast the low rate of malnutrition observed with infants whose mothers were between 25 to 35 years of age could be explained by the fact that the level of education of these mothers was usually between the second cycle of the secondary and university level. This applies mainly to those who practiced mixed feeding.

The length of Breast feeding is affected by mother's working status and literacy; with housewives Breast feeding their infants longer than those doing 'handy' jobs or on part-time or full time work. This can be explained by the lack of time by the working mothers. These results are in agreement with those obtained by Visweswara *et al.* (1982) in Singapore.

Nutritional knowledge is significantly associated to the mode of feeding; with mothers with highest nutritional knowledge preferring to exclusively breast feed their infants until 4-6 months. This can be explained by the fact that these mothers know the importance of breast milk and Breast feeding for infant health and growth this is in agreement with Schwartz (1976).

As for the age at which food supplementation should begin for infants, opinions were varied. The majority of mothers preferred to start at the age of 3 or 4 month though nowadays there are controversies concerning supplementation of babies feeding before or after the 6th month (Visweswara *et al.*, 1982; Chandra, 1981).

The infants' nutritional status varies according to age group. Using weight for age, we had 11.25% cases of mild malnutrition and 2.18% case moderate malnutrition among babies of 0 to 3 months. In this same group we had 52% cases of good nutritional status and 33.75%

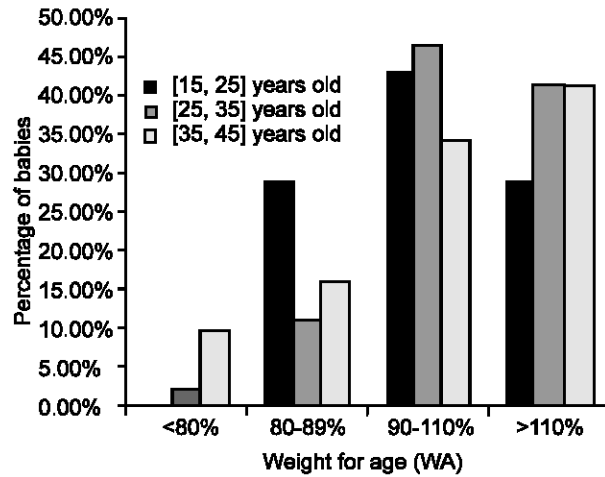


Fig. 5: Effect of mother's age on the nutritional status of the child

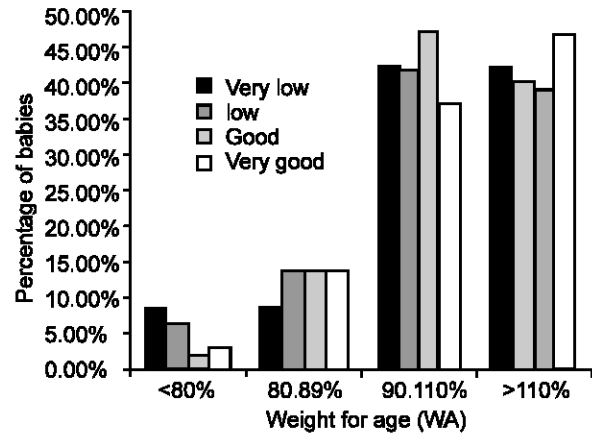


Fig. 7: Relation between mother's nutritional knowledge and children's nutritional status as indicated by weight for age

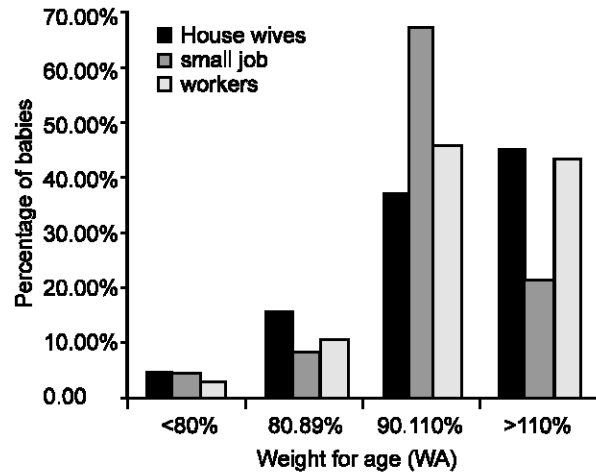


Fig. 6: Relation between mother's profession and infants nutritional status

cases of over nutrition. Among babies of 9 to 12 month of age we observed no cases of moderate malnutrition. However the level of mild malnutrition was increased (23.90%) while cases of well nourished (45.5%) and cases of over nourished (30.43%) babies decreased. This could be explained by the fact that between 0 to 3 months babies are exclusively nourished with breast milk, which seemed sufficient. Several studies have shown that the breast milk composition is unique, is best for the growing baby and helps keep the baby healthy (Monika *et al.*, 2004). We noticed that the number of malnourished babies in the 0 -3 months age group was lower than that in the 3 - 6 months and 9 -12 months age groups and that the over nourished number of babies was lower than those of the last two age groups. This could be due to the fact that it is at this period that supplementation is introduced to the infant's food.

The prevalence of malnutrition was highest among children in the 9- 12 months age group. This also corresponds to the weaning period, and justifies why this period is associated with the period in which infant mortality is high in developing countries (UNICEF, 1998). It is at this period that there is total suppression of maternal breast feeding, which is replaced either with adult food or artificially prepared baby foods, supposed to contain not only nutrients necessary for the baby at that age but also in quantities sufficient to fill up the caloric needs of the baby.

Based on the weight and the height, in almost all age groups it was observed that up to 50% of babies were over nourished, except for the age group 0 to 3 month where 6% of babies were malnourished and 38% of these had a good nutritional status. By comparing this figure with that obtained with PA, we noticed a great difference among the age groups 0 to 3 months and 9 to 12 months of age. Within the 0 to 3 months age group, the proportions of malnourished babies as well as that of good nutritional status decreased while the proportion of over nourished increased. This situation could be due to the fact that babies at this age put on weight more than they grow. Within the 9 - 12 months age group, the percentage of malnutrition was 2.18% in contrast to 23.9% obtained by P.A. There was an increase in the percentages of over nourished babies (from 30.43% to 52.17%). This could be due to the fact that these children are heavy for their age.

**Conclusion:** Breast feeding was well practiced by the Cameroonian mothers in this study, because only 4 babies out of 171 were artificially fed, the principal reasons being the lack of flow of breast milk or refusal by the baby to suckle. Other factors such as the mother's

literacy and the nature of her professional activity were associated with the length of Breast feeding. Although the infants' nutritional status was generally not significantly associated to mothers' literacy, age, working status or mothers' nutritional knowledge, the percentage of malnourished infants was affected by these factors. The mother's nutritional knowledge was also strongly associated to the mode of feeding, so it will be very important to teach mothers how to feed their children.

### Acknowledgements

We acknowledge the General Manager of Chantal Biya foundation who gave authorisation to collect data and to all the foundation workers for their collaboration. Our thanks to Dakam William for translating the work into English as well as doing some editing.

### References

- Akora, D.D. and K.K. Kaul, 1973. Feeding practices during the first five years among central indian communities. *Ind. J. Pediat*, 40: 203.
- Chandra, R.K., 1981. Breast-feeding growth and morbidity. *Nutr. Res.*, 1: 25-31.
- Kramer, M.S. and R. Kakuma, 2004. The optimal duration of exclusive breastfeeding: a systematic review. *Adv. Exp. Med. Biol.*, 554: 63-77.
- Metha, K., B. Specker, S. Barthomey, J. Giddens and M. Ho, 1998. Trial on timing of introduction to solids and food type on infant growth *Pediatrics*, 102: 569-573.
- Monika, Shubhangna and Raj, 2004. Factors affecting infant feeding practices among women of Baijnath block of Himachal Pradesh. *J. Hum. Ecol.*, 16: 29-32.
- Ong, G., M. Yap, F. Li and T.B. Choo, 2005. Impact of working status on breast-feeding in Singapore *Eu. Pub. Health*, 15: 424-430.
- Ruel, M.T. and P. Menon, 2002. Child feeding practices are associated with child nutritional status in Latin America: innovative use of demographic and health surveys. *J. Nutr.*, 132: 118.
- Schmitz, J. and A.S. McNeish, 1987. Development of structure and function of the gastrointestinaltract : relevance for weaning in weaning : why, what and when? A. Ballabriga, Rey J. Nestlé (eds) *Nutr. workshop vol 10, vevey/Raven press*, New York.
- Schwartz, H.F., 1976. Nutrition knowledge, attitudes and practices of Canadian public health nurses. *J. Nutr. Edu.*, 9.
- UNICEF, 1998. *Regard sur la situation des enfants dans le monde*. New York.
- Visweswara, K. Rao and P. Rau, 1982. Appropriate age for introduction of supplement tary foods for infants. *Statistical appraisal. Courier*, 32: 307-317.