# Nutritional Status of Children on Complementary Feeding Practices

N. B. Jadav[1], Mamta Kumari[2]* and Jagdeep Singh[3]

[1]Senior Scientist and Head, [2]Subject Matter Specialist, Krishi Vigyan Kendra, Junagadh Agricultural University, Pipalia, Rajkot-360410, Gujarat
[3]Senior Consultant and Director, Recap Consultancy LLP, Varanasi-221007, Uttar Pradesh
*Corresponding author e-mail id: mamta.kumari27@gmail.com

## ARTICLE INFO

## ABSTRACT

Complementary feeding is transitional phase where the infant is introduced with the solid foods. It is a gradual change from breastfeeding to family foods to the baby achieving six months of age. Introduction of timely, adequate and balanced weaning food is perhaps one of the most important measures to combat infant's malnutrition. Poor feeding practices results in poor performance in later life. For the study, 25 children were selected from an Anganwadi Centre and discovered the prevalence of malnutrition among the children (1-5 years) on the basis of height, weight, head/chest circumference, MUAC, etc. The degree of malnutrition was higher in boys than girls due to poor socio-economic conditions, lack of knowledge of mothers, dietary pattern, early marriages, lack of weaning/supplementary food, etc. To prevent childhood malnutrition mother's knowledge and good feeding practices should be prioritized. Thus, promotion of appropriate feeding practices should focus not only to mothers but also on other family members through Anganwadi Workers to prevent malnutrition.

## INTRODUCTION

The nutritional and health status of the infants mainly depends on the feeding practices of the community. It is being observed that the child rearing practices differ from state to state, districts and in the people living in different regions in the same state (Ram et al., 2000). Child is the chief victim of interplay of nutrition, socio-economic and health factors that cause malnutrition. The steep rise in malnutrition in children during the first two years of life is indicative of poor infant feeding practices (MHRD, 2004). Infant feeding practices comprising of both the breastfeeding as well as complementary feeding and plays a major role in determining the nutritional status of the child. The link between malnutrition and infant feeding has been well established. Recent scientific evidences reveal that malnutrition has been responsible, directly or indirectly, for 60 per cent of all deaths among children under five years annually. Over 2/3 of these deaths are often associated with inappropriate feeding practices and occur during the first year of life. The reason behind this may be the complementary feeding begins either too early or too late with foods which are too often nutritionally inadequate and unsafe. Poor feeding practices in infancy and early childhood, resulting in malnutrition, contribute to impaired cognitive and social development, poor school performance and reduced productivity in later life. Poor feeding practices are, therefore, a major threat to social and economic development as they are among the most serious obstacles to attaining and maintaining health of this important age group (Singh et al., 2002).

Breast feeding is an unequalled way of providing ideal food for the healthy growth and development of infants; it is also an integral part of the reproductive process with important implications for the health of mothers. As a global public health recommendation, infants should be exclusively breastfed for the first six months of the life to achieve optimal growth, development and health. Thereafter, to meet their evolving nutritional requirements, infants should receive nutritionally adequate and safe complementary foods while breastfeeding continues for upto two years of age or beyond. Complementary feeding is extremely

essential from six months of age, while continuing breastfeeding, to meet the growing needs of the growing baby. An infant double its weight by six months and triple by one year and the body length increases to one and a half times the at birth. Most of the organs of the body grow rapidly, both structurally and functionally during the early years of life and then later on, the growth slows down. The purpose of complementary feeding is to complement the breast milk and make certain that the young child continues to have enough energy, protein and other nutrients to grow normally (MHRD, 2004). To highlight further on prevailing weaning and complementary practices in the community, a study was conducted to find out the current scenario of feeding practices and the prevalence of malnutrition existing in the community.

## METHODOLOGY

The study was based on the primary data collected from an Anganwadi Centre- Lali Ki Sarai, Bohra Ganeshji, Near University Campus, MPUAT, Udaipur, Rajasthan. One of the aspects of study was to find out prevalence of malnutrition among infants and preschoolers aged one to five years. For this purpose, 25 preschool children were randomly selected from the Anganwadi Centre. For the assessment of nutritional status an interview schedule was developed. The mothers of children were contacted and data was collected through direct personal interview. The anthropometric measurements (height, weight, length, MUAC, Head circumference, chest circumference) of the children were taken and the data was recorded for interpretation. Height, weight, mid upper arm circumference, head and chest circumference were measured to assess the nutritional status of the subjects. The height-for-age index measures linear growth retardation among children, primarily reflecting chronic malnutrition. The weight-for-height index measures body mass in relation to body height, primarily reflecting acute malnutrition. Weight-for-age reflects both chronic and acute malnutrition. The anthropometry can be used to assess the type, extent and duration of malnutrition in a community. It is relatively efficient to detect individuals at high risk of mortality associated with malnutrition. On the basis of data collected, it was interpreted.

The statistical tool applied were percentage, mean, standard deviation and standard error.

## RESULTS AND DISCUSSION

The existing feeding practices showed that most of the mothers (84%) continued breast feeding for 12 months only and (84%) preferred packet milk to feed their children. Majority of mothers (21%) give semi-solid type of weaning food with supplementary/complementary food (68%) given at Anganwadi Centre. Very few mothers (8%) gave market food to their children due to lack of knowledge and low purchasing power. Commonly mothers (84%) provided semi-solid preparation to their children as first weaning food.

The Table 1 showed that the observed weight of children was not appropriate according to age. The mean weight of boys and girls ranged from 10.5 to11.7 kg and 9.4 to 13.5 kg that was 85.4 to 62.6 per cent and 66.4 to 76 per cent of their standard weight for 1 to 5 years' boys and girls respectively [NCHS, 1977 (Hamill et al., 1977)].

Gomez classification (Table 2) based on weight for age shows that out of 25 respondents majority of subjects (52%) were moderately and 40 per cent were mild while 8 per cent were severely underweight but none of the subjects were in normal category. It is clear that the proportion of malnutrition among boys were higher than girls.

The mean height of boys ranged between 85 to 94.2 cm that was 97.03 to 85.71 per cent of their standard height. Similarly mean height of girls ranged from 87.33 to 96.9 that was 93 to 89.4 percent of their standard height (Table 3).

McLaren's classification (Table 4) based on height for age shows that out of 25 respondents most of the subjects (56%) were short heighted followed by (32%) dwarf stature. Only 12 per cent of subjects were in the normal category. Mostly girls were dwarf and boys were short heighted. Boys were comparatively stunted height than girls.

The mean weight of boys and girls were increased with advancement of age but on comparison with standard values, inconsistent pattern was noticed (Table 5).

**Table 1.** Mean±SD values of weight of the boys and girls

| Boys | | | Age | Girls | | |
|---|---|---|---|---|---|---|
| % Standard | Observed weight (kg) | Standard weight# (kg) | (months) | Standard weight# (kg) | Observed weight (kg) | % Standard |
| – | – | 10.2 | Upto 12 | 9.5 | – | – |
| 85.36 | 10.5±2.12 (n=2) | 12.3 | 12-24 | 11.8 | – | – |
| 76.16 | 11.12±2.23 (n=4) | 14.6 | 24-36 | 14.1 | 9.36±1.18 (n=3) | 66.38 |
| 66.16 | 11.05±2.20 (n=4) | 16.7 | 36-48 | 16 | 13.85±0.63 (n=2) | 86.56 |
| 62.56 | 11.7±2.68 (n=5) | 18.7 | 48-60 | 17.7 | 13.46±1.14 (n=5) | 76.04 |

# Standard height NCHS (1977)

**Table 2.** Percentage distribution of subjects by grades of malnutrition using weight for age

| Gomez classification | Type/degree of malnutrition | Respondents (age in years) | | | | | | | | Combined (n=25) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Boys (n=15) | | | | Girls (n=10) | | | | |
| | | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | |
| <60 | Severe | | | 6.6 | 6.6 | | | | | 8 |
| 60-75 | Moderate | 13.3 | 20 | 6.6 | 26.6 | | 20 | | 10 | 52 |
| 75-90 | Mild | | 6.6 | 13.3 | | | 10 | 10 | 50 | 40 |
| >90 | Normal | | | | | | | | | |

**Table 3.** Mean±SD values of height of the boys and girls (1-5 years)

| | Boys | | Age | Girls | | |
|---|---|---|---|---|---|---|
| % Standard | Observed height (cm) | Standard height# (cm) | (months) | Standard height# (cm) | Observed height (cm) | % Standard |
| – | – | 76.1 | Upto 12 | 74.3 | – | – |
| 97.03 | 85±7.07 (n=2) | 87.6 | 24 | 86.5 | – | – |
| 87.46 | 83±2.44 (n=4) | 94.9 | 36 | 93.9 | 87.33±2.08 (n=2) | 93 |
| 82.60 | 85±9.12 (n=4) | 102.9 | 48 | 101.6 | 90 (n=4) | 88.58 |
| 85.71 | 94.2±9.49 (n=5) | 109.9 | 60 | 108.4 | 96.9±1.64 (n=4) | 89.39 |

# Standard height NCHS (1977)

**Table 4.** Percentage distribution of subjects by grades of malnutrition using height for age

| McLaren's classification | Type of stature | Respondents (age in years) | | | | | | | | Combined (n=25) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Boys (n=15) | | | | Girls ( n=10) | | | | |
| | | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | |
| <80% | Dwarf | | 6.6 | 6.6 | | | 20 | | 40 | 32 |
| 80-93% | Short | 13.3 | 13.3 | 20 | 33.3 | | | | 20 | 56 |
| 93-105% | Normal | | 6.6 | | | | 10 | 10 | | 12 |

**Table 5:** Mean±SD values of weight for height for boys and girls

| | Boys | | | Age (months) | Girls | | | |
|---|---|---|---|---|---|---|---|---|
| % Standard | Observed weight (kg) | Expected weight# (kg) | Height (cms) | | Height (cms) | Expected weight# (kg) | Observed weight (kg) | % Standard |
| – | – | – | – | Upto 12 | – | – | – | – |
| 86.77 | 10.5±2.12 (n=2) | 12.1 | 85±7.07 | 24 | – | – | – | – |
| 95.04 | 11.12±2.23 (n=4) | 11.7 | 83±2.44 | 36 | 87.33±2.08 | 12.3 | 9.36±1.18 (n=3) | 76.09 |
| 91.32 | 11.05±2.20 (n=4) | 12.1 | 85±9.12 | 48 | 90±2.46 | 12.9 | 13.85±0.63 (n=2) | 107.36 |
| 82.39 | 11.7±2.68 (n=5) | 14.2 | 94.2±9.49 | 60 | 96.9±1.64 | 14.6 | 13.46±1.14 (n=5) | 92.19 |

# Standard height NCHS (1977)

**Table 6.** Percentage distribution of subjects by grades of malnutrition using weight for height

| Gopaldas, T. & Seshadri, S. Classification | Type/degree of malnutrition | Respondents (age in years) | | | | | | | | Combined (n=25) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Boys (n=15) | | | | Girls (n=10) | | | | |
| | | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | |
| <75% | Severe | | | | 6.6 | | 10 | | | 8 |
| 75-84% | Moderate | 6.6 | 6.6 | 6.6 | 13.3 | | 10 | | 10 | 28 |
| 85-90% | Marginal | | | | | | 10 | | | 4 |
| >90% | Normal | 6.6 | 20 | 20 | 13.3 | | | 10 | 50 | 60 |

**Table 7.** Mean±SD values of MUAC for boys and girls (1-5 years)

| | Boys | | Age | Girls | | |
|---|---|---|---|---|---|---|
| % Standard | Observed MUAC (cm) | Standard MUAC# (cm) | (months) | Standard MUAC# (cm) | Observed MUAC (cm) | % Standard |
| – | – | 15.9 | 12-23 | 15.6 | – | – |
| 84.32 | 13.66±1.52 (n=3) | 16.2 | 24-35 | 16.0 | 13.5±2.12 (n=2) | 84.37 |
| 85.32 | 14.25±1.70 (n=4) | 16.7 | 36-47 | 16.7 | 13 (n=1) | 77.84 |
| 86.25 | 14.75±0.5 (n=4) | 17.1 | 48-59 | 16.9 | 14±2.82 (n=2) | 82.84 |
| 82.85 | 14.5±0.57 (n=4) | 17.5 | 60-71 | 17.5 | 13.4±1.51 (n=5) | 76.57 |

# Standards from Hane-Survey I (USA) (1971-1974)

According to classification based on Weight for Height given by Gopaldas and Seshadri (Table 6) depict that greater part of subjects were normal (60%) followed by moderate (28%), severe (8%) and (4%) marginal malnutrition. Majority of both the sexes were in normal category.

Table 7 shows the mean MUAC of boys and girls ranged from 13.66 to14.5 cm and 13.5 to 13.4 cm that was 84.3 to 82.8 per cent and 84.3 to 76.5 per cent of their standard MUAC for boys and girls respectively (Standards from Hane-Survey I [(USA) (1971-1974) (Margaret et al., 2005)].

According to classification shown in Table 8 for Mid Upper Arm Circumference gives a picture that mainly subjects belonged to normal (64%) category. But out of 25 respondents half of them also belonged to severe (24%) and moderate (8%) category. Table 8 indicates that girls were severely malnourished in comparison to boys.

**Table 8.** Percentage distribution of subjects by grades of malnutrition using MUAC

| Gopaldas, T. & Seshadri, S. Classification | Type/degree of malnutrition | Respondents (age in years) | | | | | | | | Combined (n=25) |
| | | Boys (n=15) | | | | Girls (n=10) | | | | |
| | | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | |
| <12.5 cm | Severe | | 6.6 | 6.6 | | | 10 | | 30 | 24 |
| 12.5-13.5cm | Moderate | | | | | | 10 | | 10 | 8 |
| >13.5 cm | Normal | 13.3 | 20 | 20 | 33.3 | | 10 | 10 | 10 | 64 |

**Table 9.** Percentage distribution of subjects by grades of malnutrition using head/chest circumference ratio

| Gopaldas, T. & Seshadri, S. Classification | Type/degree of malnutrition | Respondents (age in years) | | | | | | | | Combined (n=25) |
| | | Boys (n=15) | | | | Girls (n=10) | | | | |
| | | 1-2 | 2-3 | 3-4 | 4-5 | 1-2 | 2-3 | 3-4 | 4-5 | |
| <1 | Normal | 6.6 | 6.6 | 13.3 | 6.6 | | 20 | 10 | 50 | 52 |
| ≥1 | Mal-nourished | 6.6 | 20 | 13.3 | 26.6 | | 10 | | 10 | 48 |

From the Table 9 it is obvious that around half of the subjects (52%) were normal and half were malnourished (48%) according to head and chest circumference ratio. The data also specifies that boys were comparatively more malnourished than girls. Thus, it could be concluded that the growth of the subjects was inappropriate according to the standards.

Anthropometric measurements revealed that the degree of malnutrition was higher mainly in boys rather than girls in case of weight for age, height for age and head and chest circumference. In case of mid upper arm circumference, the girls were malnourished. Similar result of some studies showed that more percent of male subjects suffered from different grades of malnutrition than female subjects (Zanver et al., 2007). The lower prevalence of wasting than stunting or underweight indicates that chronic malnutrition was more prevalent than acute malnutrition. Boys and girls have about the same levels of stunting and underweight, but boys were somewhat more likely than girls to be wasted. The disadvantage of boys in this regard is surprising in view of other evidence that girls tend to receive less care than boys in India. Some other studies have also observed the absence of the expected gender differences in nutrition in India, as well as in other developing countries with widespread discrimination against girls, but no concrete reasons for this unexpected finding were suggested (Diez Navarro et al., 2017; Khara et al., 2017; Myatt et al., 2018). This might be due to the fact that boys were mainly indulged in outdoor activities and this lead to irregular and insufficient feeding and frequency of feeding is also inadequate. Also the mother is not giving proper attention to the child due to working outside. Mostly mothers left their children at Anganwadi Centre. The other possible reason may be short duration of breastfeeding, poor socio-economic conditions, lack of knowledge of mothers, vegetarian diet pattern leading to less nutrient absorption, birth space, early marriages, underweight mothers, poor hygiene and lack of weaning/supplementary food. A significant relationship between poverty, poor family income, low socioeconomic status, large family size, poor hygiene and inadequate birth spacing has been implicated as a risk factor for severe malnutrition in different studies (Haider et al., 2005; Odunayo and Oyewole, 2006).

In some anthropometric measurements like weight for height, mid upper arm circumference, head/chest circumference majority of subjects were normal. The possible reason for this may be dispensing of supplementary/complementary food (Baby Mix) by the Anganwadi Workers (AWs) to every child (1 to 5 years) in the community and also providing mid-day meal (*khichidi, dalia,* etc.) to every child attending the Anganwadi Center, schedule vaccination given by AWs, educating mothers and taking care of their children. Maternal and child health literacy plays a key role in better utilization of health related services. In this regard intervention programmes can enhance the knowledge which eventually translates into change in attitude and practices (Singh and Bisht, 2021). Singh et al., (2019) also found that the knowledge of women regarding child care was significantly correlated with the type of family, income, education and exposure to mass media. Thus, AWs might play a significant role and could bring behavioral change in the community by their remarkable contribution.

## CONCLUSION

The research demonstrated that undernutrition as defined by anthropometric standards is more common in boys than in girls. It's crucial to note that the study's conclusion is not that boys should be prioritized above girls, but rather that all at-risk children should be supported through a better knowledge of sex differences in undernutrition. It could be believed that all children under the age of five, as well as their caregivers, should be considered a high priority group for targeted nutrition interventions, with resources and actions allocated based on need. Mothers have to be educated about the importance of breast feeding, proper time to start weaning, advice against indulging in harmful feeding practice. A health and nutrition survey must be conducted at proper intervals. It may be highly useful for the policy making purposes and to prevent malnutrition. Timely monitoring of Anganwadi centres is need of the hour.

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