Introduction
Arabian Gulf countries, namely Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates have similar demographic, social, cultural, and environmental characteristics. These countries have experienced rapid economic and social changes during the past two decades, resulting in a marked improvement in life-style and health status. However, these rapid changes have led to the development of a paradoxical nutrition situation, as both under and over nutrition exists. Under-nutrition manifested as growth retardation among preschool children and iron deficiency anaemia, while overnutrition manifested as obesity, dental caries, and non-communicable nutrition related diseases.

Infant and young children are more susceptible to the development of nutritional problems than other groups. The aim of this report is to highlight the current infant feeding practices and nutritional status of these groups, and to suggest some measures to improve their nutritional status.

Infant Feeding Practices
Breastfeeding patterns
Several reports have shown that the percentage of mothers who breastfed their infants, as well as the duration of breastfeeding have declined sharply in the Arabian Gulf countries, especially during the oil boom period (1973–1981). In Bahrain, for example, the duration of breastfeeding was about 2 years in 1960s, and declined to 11 months in 1970s, and to 8 months in 1980s. WHO reported that traditionally new mothers learned to breastfeed from their own mothers and other role models in the community. However, urbanization and economic transition have taken many women out of their traditional social support system, so that successful role models of breastfeeding are no longer readily available.

Mixed feeding (bottle and breast) has become the main method of feeding in the first 6 months of infant life. Recent Child Health Surveys which were carried in all Arabian Gulf countries showed that the percentage of mothers who practised mixed feeding ranged from 43 per cent in Kuwait to 55 per cent in Oman. However, most community surveys in the region revealed that bottlefeeding was introduced as early as at the first day of infant's life. A recent National Nutrition Survey (1992) in the United Arab Emirates showed that 42 per cent of mothers gave their children bottle at the age of 1 month, 21 and 9 per cent gave at ages of 2 and 3 months, respectively.

Factors responsible for early stoppage of breastfeeding in these countries can be summarized as: illiteracy of mothers, lack of nutrition awareness, influence of sales promotion, the role of private doctor to promote infant formula, mothers’ employment, high per capita income which makes it possible for mothers to purchase baby foods, early introduction of supplementary foods, and unsound beliefs and attitudes towards breastfeeding and weaning of infants.

Weaning habits
Weaning can be a dangerous period for the health of infants. Introduction of weaning foods at an early time, inappropriate choice of foods and unhygienic preparation of weaning foods may lead to malnutrition and infection among infants. Several studies have reported that many children in the Gulf failed to grow after 6 months of age, which is probably due to environmental factors and unsound weaning habits.

Weaning foods are introduced very early in all Arabian Gulf countries. In a study in five geographical regions in Oman, it was found that 31 per cent of mothers introduced weaning foods before the age of 4 months, and commercial baby foods were the main foods introduced. Many mothers introduced honey, ghee and glucose water during the first days of infant life. These practices discourage the suckling of breast and may reduce the appetite of infant for the milk of his mother. It is well documented that the introduction of foods other than breastmilk at an early period (before 4 months) decreases the frequency of breastfeeding leading to early stopping of breastfeeding.

Preparation of baby foods
Unsound and unhygienic preparation of infant formula and weaning foods have complicated the
problem. In Saudi Arabia, it was found that 74 per cent of mothers prepared the feeds incorrectly and 60 per cent of these mothers prepared over-concentrated feeds. In Kuwait, it was reported that only 45 per cent of mothers measured the scoop of powdered milk carefully. Over-concentration or over-dilution of powdered milk negatively affects the health status of infants if this method is used for a long time.

Unhygienic preparation of baby foods was documented by many studies in the region. High illiteracy rate among mothers makes it impossible for them to read the instructions written on the label, so that the feeds are prepared according to the judgement of the mothers. Moreover, unhygienic preparation might have been done by foreign housemaids, since they are generally responsible for feeding the children, including those who have to be bottle-fed. This may affect the health status of the children as these housemaids come from low socio-economic backgrounds and have little or no knowledge of sterilization techniques. Unhygienic preparation of baby feeds may be responsible in part for the high incidence of diarrhoea among infants in the region.

**Nutritional Problems**

*Low birth weight*

Low birth weight (less than 2.5 kg) is widely used as an indicator of health and nutritional status of children. Low birth weight (LBW) rates in the Arabian Gulf countries range from 6 to 8 per cent, which compares favourably with other developing countries. However, most of figures reported were based on hospital records and may therefore not reflect the actual incidence of LBW.

Factors determining birth weight in these countries have not been well investigated. It was found that the sex of child, geographical location, mother’s age, and interval between births contributed significantly to birth weight of the newborn. Iron deficiency is highly prevalent among Arabian Gulf pregnant mothers, which may play a role in prevalence of low birth weight in the region.

*Undernutrition*

Acute undernutrition was uncommon from region to region in each country. Recent survey on nutritional status in Oman reported 5 per cent of severe wasting (below –3 SD) at age 1.5 year. In general, underweight (weight-for-age) among preschool children ranges from 6.4 per cent in Kuwait to 34 per cent in Oman. Stunting (height-for-age) is also widely prevalent (ranges from 12.2 per cent in Kuwait to 44 per cent in Bahrain). Wasting is less prevalent among preschool children when compared with underweight and stunting (3–9 per cent). The prevalence of wasting decreased with age, and severe wasting is rare among children aged 5 years and above. It was found that Kuwaiti children were in a better nutritional status compared to their counterparts in other Gulf countries. This may be due to several environmental, health, and socio-economic factors.

Factors determining undernutrition in these countries have not been investigated. Unsound infant feeding practices, poor food habits, low intake of some nutrients and infection, especially intestinal parasitic and microbial infection, may be the most important factors contributing to undernutrition in the region. The multi-ethnic origin of children in some Gulf countries is also a matter of concern, as genetics play an important role in maturation of children.

*Vitamin D deficiency*

Vitamin D deficiency has been reported in these countries in spite of abundant sunlight. Most of the studies came from Saudi Arabia. It was found that maternal vitamin D deficiency has a role in the pathogenesis of rickets in infant born with inadequate vitamin D status, indicating that the disease has its origin in the perinatal period. Low concentration of 25-hydroxy-vitamin D (25-OHD) was observed in children, pregnant and lactating mothers in Saudi Arabia. Several factors contributing to the prevalence of vitamin D deficiency in the region include, avoidance of exposure to sunlight, lack of vitamin D in staple diet, an increase in UV light insulation due to atmospheric dust particles, types of dwellings which do not offer direct access to sunshine and using unfortified powdered milk with vitamin D.

*Iron deficiency anaemia*

Iron deficiency anaemia is a major nutritional problem in these countries. It is highly prevalent among preschoolers, teenage girls, and pregnant and lactating mothers. Recent surveys showed that the prevalence of iron deficiency anaemia (based on haemoglobin level) in preschoolers in the region ranged from 30 to 62 per cent. Among teenage girls, the prevalence is also high (ranging from 13 to 58 per cent), while about 50 per cent of pregnant mothers are anaemic (Hb<10 g/100 ml). The lowest prevalence of iron deficiency was observed in Kuwait. This confirms previous findings that Kuwaiti children have better nutritional status (based on anthropometric measurements) than children in other Gulf countries.

The high prevalence of iron deficiency anaemia in the Gulf may be attributed to a variety of factors such as low intake of food rich in iron, intake of foods that contain substance which inhibit iron absorption (such as tannin in tea and coffee), low intake of food rich in vitamin C which enhances iron absorption and parasitic infection. Studies of factors associated with iron deficiency anaemia are urgently needed.
needed to propose suitable measures to prevent and control this problem.

**Food poisoning and food-borne diseases**

Food poisoning and food-borne diseases are neglected as hazards to infant and young children in Gulf countries. This may be due to under-reporting of these diseases. Food-borne diseases may be toxic or infection in nature and caused by ingestion of contaminated foods. These illnesses can be grouped by the causative agent viz bacterial, fungal, viral, parasitic, and chemical types. Health consequences due to these diseases can be more severe and may lead to death, especially in individuals with low resistance as, for example, infant and young children.

Information on food poisoning among children in the Gulf is scanty. Health statistics in the region show that bacteria are a leading cause of food-borne diseases among young children, and salmonellosis are the most common type followed by shigellosis, typhoid, paratyphoid, and amoebiasis, respectively. In Bahrain, for example, it was found that of all salmonellosis cases reported in 1991, 51 per cent occurred in children below 5 years of age. The high prevalence of bottle-feeding and unhygienic preparation of baby foods may be responsible in part for the salmonellosis among children below one year of age.

Studies in Saudi Arabia, Bahrain, and Oman indicate that intestinal parasitic infections are still widely prevalent among preschool and school children. The most common parasites isolated were *G. lamblia, T. trichiura*, and *H. nana*. Personal hygiene is the most important factor responsible for the high incidence of these parasites. Expatriate food handlers and housemaids also play an important role in spreading intestinal parasites among local population, as the majority of expatriates come from endemic countries.

Infant and young children are more vulnerable to chemical poisoning because of their tendency to put objects in their mouth. An example of this kind of poisoning is lead poisoning. Lead is a cumulative poison which produces a series of effects in health status. Lead poisoning has been reported in the Arabian Gulf countries. In Kuwait, Shaltout et al. screened 140 infants and children aged 3 months to 5 years for lead poisoning and showed that 29 per cent of these children had blood lead levels >25 µg/dl which is the current definition of elevated blood lead levels. The main reason for lead poisoning in these children is using traditional medicines for treating certain diseases. A recent study in Saudi Arabia suggested that exposure to lead continues to pose a serious health hazard among children and an urgent action is needed.

**References**


