Food-based dietary guidelines and nutrition interventions for children at primary healthcare facilities in South Africa

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Abstract

Existing dietary recommendations and nutrition counselling provided to mothers/caregivers at primary healthcare (PHC) facilities are reviewed and analysed to be consistent with food-based dietary guidelines (FBDGs) that are being developed for preschool children. Recommendations provided by the Integrated Management of Childhood Illness and the provincial Paediatric Case Management Guidelines, which are currently implemented at PHC facilities were reviewed. For FBDGs to be consistent with nutrition counselling that is provided to mothers/caregivers at these facilities, various principles need to be promoted. These include among others, exclusive and on-demand breastfeeding in the HIV-negative mother; exclusive breastfeeding with abrupt cessation preferably at 6 months or exclusive, safe and adequate formula feeding in the HIV-infected mother; the introduction of complementary feeds in all infants at 6 months; the provision of energy-dense and micronutrient-enriched (particularly, iron, zinc, calcium and vitamin A) complementary feeds; frequent visits to the healthcare facility; and physical activity aimed at encouraging a healthy lifestyle and preventing overweight and obesity in childhood. The FBDGs should be incorporated into nutrition and child health programmes and be reviewed and modified regularly.

Keywords: food-based dietary guidelines, primary health care, nutrition counselling, preschool children, South Africa.

South Africa is a society in nutrition transition as evidenced by the coexistence of under- and over-

nutrition within the same population. This is reflected in the results of the National Food Consumption Survey (Labadarios *et al.* 1999) of children aged 1–9 years, which showed that while 10.3% were underweight and 21.6% were stunted, 6% were overweight. Undernutrition contributes to 50% of deaths

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in children below 5 years of age from common childhood illnesses such as neonatal disorders, diarrhoea, pneumonia, malaria and HIV/AIDS (Black *et al.* 2003). Overweight and obesity have been linked to nutrition-related non-communicable diseases and to high adult mortality rates (Popkin 2002). The development of food-based dietary guidelines (FBDGs) as recommended jointly by the World Health Organization (WHO) and the Food and Agriculture Organization of the United Nations aims to address the problems of under- and over-nutrition, optimizing the nutrition status of all communities, irrespective of socio-economic status. This 'double-burden' of disease in South Africa makes the development of FBDGs a complex procedure.

The rationale for developing separate FBDGs for preschool children is based on their specific nutritional needs for growth and development and the public nutrition issues such as over-nutrition affecting children in this age group (Vorster *et al.* 2001). In South Africa, there are a number of nutrition and child health programmes, derived from WHO and United Nations Children's Fund (UNICEF), which currently provide nutrition counselling to mothers/caregivers with preschool children at primary health-care (PHC) facilities. As this is often the first contact point with the healthcare system and constitutes one of the main sources of information, it is important that the FBDGs are consistent with and complement existing dietary recommendations provided to mothers/caregivers. Other reasons for linking FBDGs to existing nutrition interventions for children relate to cost effectiveness, sustainability and mutual strengthening of these different approaches. The objective of this article was to review and analyse dietary recommendations and nutrition counselling currently provided to mothers/caregivers frequenting PHC facilities and to outline the main dietary issues requiring consistency between FBDGs and existing nutrition interventions for infants and preschool children. This was seen as being part of broader process for the development of paediatric FBDGs.

This was a review of the dietary recommendations and nutrition counselling provided to mothers through the health facility-based component of the Integrated Nutrition Programme (INP) that is imple-

mented at PHC facilities in South Africa. The review also included nutrition recommendations and counselling provided through the Integrated Management of Childhood Illness (IMCI) and the provincial Paediatric Case Management Guidelines.

Description of existing nutrition interventions for children

There are several programmes in nutrition and child health in the public sector in South Africa that are linked to health facility-based nutrition interventions at the primary level of care. With respect to nutrition, the INP facilitates a coordinated intersectoral approach to solving nutrition problems based on the UNICEF Conceptual Framework, which views under-nutrition as the result of immediate, basic and underlying causes and the implementation of nutrition programmes as an ongoing process of assessment, analysis and action (i.e. the triple A cycle) (Department of Health 2004). The main focus areas of the INP include: (1) promotion, protection and support of breastfeeding; (2) growth monitoring and promotion (GMP); (3) micronutrient malnutrition control; (4) disease-specific nutrition support, treatment and counselling; (5) nutrition promotion, education and advocacy; (6) contribution to household food security; and (7) food service management.

Promotion, protection and support of breastfeeding

According to data from the South African Demographic Health Survey (1998), breastfeeding was initiated in 87% of infants but only 10% of infants aged 0–3 months were exclusively breastfed (Department of Health 2002). There is evidence to support exclusive breastfeeding in reducing mortality and morbidity from diarrhoea and respiratory infections in early infancy (Victoria *et al.* 1987). The Baby-Friendly Hospital Initiative (BFHI) based on the Ten Steps to Successful Breastfeeding of the UNICEF and the WHO (2005) encompasses the recommendations of the *International Code of Marketing of Breast Milk Substitutes* and the *World Health Assembly (WHA) Resolutions*. South Africa, as a member of the WHA

and a signatory to the United Nation's Convention on the Rights of the Child is bound by these resolutions and has adopted the BFHI and the Code on the Marketing of Breast Milk Substitutes. Since 1995, the Department of Health has implemented the BFHI (Department of Health 2001) and up to 2004, a total of 140 of 480 (29.2%) health facilities with maternity beds, were assessed and declared baby-friendly. Training of trainers in Lactation Management courses, as well as assessor training, is regularly conducted. Training focuses specifically on health professionals, including nurses, dietitians, nutritionists and paediatricians.

GMP

Growth monitoring and promotion is an integral part of PHC and entails the regular measurement and recording of weight-for-age on the Road to Health Card (RTHC) and interpretation of the child's growth curve; health workers are trained to counsel mothers to make decisions aimed at improving their child's growth based on the growth curve. There are no statistics on the extent to which GMP is practised at PHC health facilities but in 1998, 75% of children aged 12–23 months nationally were reported to have a RTHC (Department of Health 2002).

Micronutrient malnutrition control

The main micronutrient deficiencies of public health significance among infants and preschool in South Africa include vitamin A, iodine, iron and zinc (Labadarios *et al.* 1999; Department of Health 2004). Supplementation with vitamin A capsules is one of the strategies of the Department of Health to prevent vitamin A deficiency, which affected a third of children aged 6–72 months nationally in 1994 (Labadarios & Van Middelkoop 1995). The Department of Health has commenced with the routine administration of high-dose vitamin A capsules to women in the post partum period (within 6–8 weeks after delivery) and to children 6–60 months. Vitamin A supplementation is also provided to children who suffer from severe undernutrition, measles, persistent diarrhoea and xerophthalmia (Department of Health 2002). The regulations for the mandatory fortification

of all maize meal and bread flour with vitamins A, thiamin, niacin riboflavin, pyridoxine; iron; folate; and zinc, came into effect in 2003 (Department of Health 2004). The regulations allow the voluntary use of a food fortification logo to promote fortified maize meal, bread flour and bread baked with fortified flour. There is also mandatory iodisation of salt since 1995 to address the problem of iodine deficiency in children (Department of Health 2004).

Nutrition promotion, education and advocacy

Nutrition education relates to communication activities around adequate nutrition to improve nutritional status, prevent nutrition-related diseases and to improve the quality of life of mothers and children. Nutrition promotion includes communication activities designed to facilitate the objectives of the INP. Nutrition advocacy is an activity supporting a nutrition issue or drawing attention to a nutrition issue to achieve a desired result – it is an action directed at changing policies, positions and views of programmes.

Disease-specific nutrition support, treatment and counselling

Children with under-nutrition are managed by the Health Facility-Based Nutrition Programme (HFBNP), which contains a package of nutrition interventions that are implemented at PHC facilities. These include GMP for under-fives, promotion of breastfeeding and complementary feeding, vitamin A supplementation, improvements in the nutrition status of pregnant and lactating women, nutrition-related disease management and nutrition supplementation for undernourished children through the Nutrition Supplementation Programme. The HFBNP is also linked to community based and poverty relief programmes, where these are in place. Health workers are trained and encouraged to implement the provincial policies on the HFBNP (Department of Health 2004).

The main child health programmes that are linked to the INP for implementation at PHC facilities include the IMCI (Department of Health (South Africa), WHO, UNICEF 2003) and provincial case

management guidelines such as the Paediatric Case Management Guidelines in the Western Cape (Provincial Administration of the Western Cape (PAWC) and Maternal and Women's Health and Nutrition Sub-directorates 1999). There is consistency in the content and overall approach of these guidelines. The WHO and UNICEF developed the IMCI strategy in 1995 (Tulloch 1999). The need for IMCI was based on children presenting at PHC facilities with more than a single condition, which required a combined and integrated approach to management. While the major stimulus for IMCI included appropriate curative care, the strategy also includes immunization, disease prevention and health and nutrition promotion (especially on growth). IMCI was adopted by the National Department of Health in 1997 and implemented in all the provinces of South Africa (Shung-King *et al.* 2003). The strategy focuses on the main causes of under-five mortality in developing countries viz. diarrhoea, acute respiratory infections, measles, malaria, undernutrition and HIV/AIDS. Generic guidelines on these conditions have been adapted for local use. The three main components of IMCI include: (1) improvement in the case management skills of PHC providers through the provision of guidelines and an 11-day training course with supervisory visits; (2) improvement in the health service through the provision of essential drugs and an effective referral system; and (3) improvement in family and community practices such as feeding, disease prevention and home-based treatment and immunization. Health workers are trained to assess the nutritional status of children, to classify children based on their nutritional status, to manage the child with underweight (low weight-for-age) and to identify children requiring hospital referral (children with danger signs or severe undernutrition). Counselling mothers during illness and health forms an integral part of the IMCI strategy. Health workers are trained to ask appropriate questions, to listen to what the mother/caregiver is already doing for the child, to affirm the mother for what she has done well, to negotiate issues on child care and to check the mother's understanding. The mother is informed when immediate follow-up is required (Tulloch 1999).

Nutrition promotion/counselling provided through existing PHC facility-based nutrition interventions

Programmes such as the IMCI (see Table 1), Paediatric Case Management Guidelines (Provincial Government of the Western Cape) and the BFHI promote, protect and support the principles of breastfeeding as contained in the Innocenti Declaration (UNICEF/WHO 2005). Exclusive breastfeeding, which entails breastfeeding only, and no other food or drink including water in the first 6 months of life, is promoted where the mother is HIV-negative (Department of Health (South Africa), WHO, UNICEF 2003). This is in keeping with current evidence that shows that infants who are exclusively breastfed for 6 months show no deficits in growth and less morbidity from diarrhoea than those given mixed feeding as of 3–4 months of age (Kramer & Kakuma 2002). Studies show that when breast milk is supplemented with other fluids in infants younger than 6 months, the risk of morbidity and mortality from diarrhoea increases, there is a lower intake of breast milk and the duration of breastfeeding is shorter compared with exclusively breastfed infants (Martines *et al.* 1992). IMCI promotes breastfeeding on demand or frequent feeds (at least eight times daily), which have been associated with a significantly increased duration of breastfeeding in infants in Brazil (Martines *et al.* 1989).

According to the National Breastfeeding Guidelines, if the mother is HIV-infected, she should make an informed choice between exclusive breastfeeding or exclusive replacement feeding (where this is accessible, feasible, affordable, sustainable and safe) on the balance of the risks and benefits of either method of feeding that is explained to her. This is based on comparable rates of mother-to-child transmission of HIV-1 in exclusively breastfed compared with replacement-fed infants early in infancy in HIV-infected mothers (Coutsoudis *et al.* 1999). Vertical transmission of HIV-1 at 3 months among exclusively breastfed, mixed-fed and replacement-fed infants was 14.6%, 24.1% and 18.8% in a study conducted in Durban with significant differences in HIV-1 transmission between the exclusively breastfed and the

Table 1. Nutrition counselling based on the Integrated Management of Childhood Illness (IMCI) (Department of Health (South Africa), WHO, UNICEF 2003).

Age	IMCI recommendations
Up to 6 months of age	For mother HIV-negative or unknown HIV status: • Breastfeed as often as the child wants, day and night • Feed at least eight times in 24 h • Do not give other foods or fluids For HIV-infected mother • Breastfeed exclusively as often as the child wants, day and night Or (if accessible, feasible, affordable, sustainable and safe), replacement feed exclusively • Cup feeding is safer than bottle (if replacement feeding is used) • Stop breastfeeding completely at 6 months (safe transition from exclusive breastfeeding)
6 months up to 12 months	For mother HIV-negative or unknown HIV status • Breastfeed as often as the child wants • Give three servings of nutritious complementary foods • Always mix margarine, fat, oil, peanut butter or ground nuts with porridge • Give egg, beans, lentils, meat, fish, chicken, locally available protein, full cream milk, mashed fruit and vegetables • If baby is not breastfed give three cups full cream milk • If baby gets no milk give six complementary feeds per day For HIV-infected mother • Do not breastfeed after 6 months • Complementary and formula feeds as for mother who is HIV-negative or of unknown status
12 months up to 2 years	For mother HIV-negative or unknown HIV status • Continue breastfeeding as often as the child wants • If no longer breastfeeding, give other milk every day • Give at least five adequate nutritious feeds • Feed actively For HIV-infected mother • As for mother who is HIV-negative or of unknown HIV status
2 years and older	For mother HIV-negative or unknown HIV status • Give the child her own serving of family foods three times a day • In addition, give two nutritious snacks such as bread with peanut butter, full cream milk or fresh fruit between meals • Continue active feeding For HIV-infected mother • As for mother who is HIV-negative or unknown HIV status

mixed-fed infants. Based on this, IMCI emphasizes exclusive breastfeeding with abrupt cessation at 6 months and a safe transition to replacement feeding in HIV-infected mothers who choose to breastfeed their infants. Reasons for stopping breastfeeding at 6 months are linked to a higher risk of HIV-1 transmission with mixed feeding and with increased duration of breastfeeding (Leroy *et al.* 1998).

If the mother chooses to replacement feed and replacement milk is accessible, feasible, affordable, sustainable and safe to prepare, she is advised to practice exclusive replacement feeding. Advice is provided on cup feeding, the correct preparation of feeds,

sterilization of feeding utensils and the use of appropriate quantities of replacement milk (Department of Health (South Africa), WHO, UNICEF 2003). With respect to replacement feeding, in children under 6 months commercial infant formula is preferable in meeting the infant's nutritional requirements and not home-prepared powdered or full cream fresh milk, which have been found to be nutritionally inadequate and are associated with iron deficiency anaemia as well as a high renal solute load (Dewey *et al.* 2004; Papathakis & Rollins 2004).

The WHO recommends, where the mother is HIV-negative, that following the first 6 months of exclusive

breastfeeding, mothers should continue to breastfeed for up to 2 years of age and beyond while introducing nutritionally adequate and safe complementary foods. Six months is taken as the cut-off age for the introduction of complementary foods as the gap between the total energy requirements and the energy provided by breast milk increases from 6 months onwards with increasing age of the infant (World Health Organization 1998). It has been determined that the energy needed from complementary foods during the age ranges 6–8, 9–11 and 12–23 months averages 270 kcal day⁻¹, 450 kcal day⁻¹ and 750 kcal day⁻¹, respectively. Assuming an average breast milk intake, the energy provided from this source amounts to 60%, 45% and 30% of the total energy requirements per day for these respective age ranges. For the well-nourished breastfed infant it has been determined that 3 complementary feeds per day with an energy density of 0.85 kcal g⁻¹ could meet the total energy requirements at 6–8 months of age, even with a low breast milk intake (World Health Organization 1998). Malnourished infants of the same age, however, would need complementary foods with a higher energy density or one or more additional meals. Older infants and young children need complementary foods of higher energy density or increased frequency of feeding (World Health Organization 1998). On the basis of this, the IMCI guidelines recommend that mothers introduce complementary foods at 6 months of age, which are energy-dense and given at least three times daily. In children above 12 months of age, children should be introduced to family foods, which are energy-dense and given at least five meals per day to meet their total energy requirements (Department of Health (South Africa), WHO, UNICEF 2003).

Micronutrients, also labelled 'problem nutrients', that are difficult to supply in the diet of children in developing countries include iron, zinc, vitamin A and calcium (Beaton *et al.* 1993; World Health Organization 1998). Breast milk cannot meet the iron requirements of full term infants after 6–9 months or those of low birthweight infants before 6 months. Iron deficiency anaemia may manifest as delays in psychomotor and cognitive function, impairment in growth and increased susceptibility to infection (Walker *et al.*

2007). Zinc is important in growth and supplementation has been associated with significant improvements in height and weight in children with initial low weight-for-age and low height-for-age. Supplementation with zinc has been associated with an 18% reduction in the incidence of diarrhoea, a 41% reduction in the incidence of pneumonia and a 67% and 50% reduction in mortality in infants born small for gestational age and in older children, respectively (Gibson 2006). Vitamin A supplementation has been associated with a 23% reduction in all-cause mortality in children aged 6–60 months, particularly from diarrhoea and measles. Vitamin A supplementation in HIV-infected children has been shown to reduce morbidity because of diarrhoeal disease and reduce mortality in HIV-infected children (Fawzi *et al.* 1999). Breast milk is an important source of nutrients such as vitamin A even in the second year of life (Beaton *et al.* 1993). To prevent iron, zinc and calcium deficiency, it is important to promote the consumption of complementary foods that are rich in or fortified with these micronutrients. To ensure adequate intake of these micronutrients, the IMCI guidelines recommend a varied diet and emphasize the intake of foods that are rich in iron (e.g. meat, organ meats, chicken and dark green vegetables); vitamin A (e.g. liver, mango, pawpaw and sweet potato), zinc (meat, fish and legumes) and calcium (full cream milk). All maize meal and wheat flour that are processed by the millers in South Africa are currently fortified with these micronutrients and consumption of these foods could ensure adequacy of these micronutrients, particularly in preschool children (Department of Health (South Africa), WHO, UNICEF 2003).

Issues that need to be addressed by FBDGs

It is important that FBDGs are consistent with the WHO/UNICEF recommendations on exclusive and frequent or on-demand breastfeeding in the first 6 months of life. Where mothers are HIV-negative the recommendation of the FBDGs should be the continuation of breastfeeding until 2 years of age and beyond following the introduction of complementary feeds. While the rationale for the promotion of breastfeeding

is based on improvements in growth and development and reductions in morbidity and mortality in breastfed infants compared with formula fed infants, breastfeeding may also contribute to reducing overweight and obesity in later life (Labbok 2005).

Provision must be made for the HIV-infected mother with respect to exclusive breastfeeding with abrupt cessation at 6 months or exclusive and safe formula feeding, based on an informed choice of either method of feeding.

The age at which complementary feeds need to be introduced (i.e. at 6 months of age) should be stipulated in the FBDGs and information supplied on nutrient-dense complementary foods such as maize meal porridge and the recommended frequency of complementary feeds at different ages. The recommendation 'enjoy a variety of foods' as currently contained in the adult FBDGs is appropriate as children consuming a varied diet have been found to consume 10% more than those consuming a diet which is monotonous (World Health Organization 1998); messages relating to this aspect should take into account the foods that are recommended in the IMCI guidelines. The FBDGs should inform and promote an adequate intake of affordable foods rich in vitamin A, iron, zinc and calcium, particularly in children aged 6–24 months. All children between 6 and 60 months should receive vitamin A supplementation. Advice should also be provided on frequent feeding and ensuring an adequate dietary intake in sick children.

Feeding behaviour, which relates mainly to the style of feeding and the appetite of the child, are important determinants of dietary intake (World Health Organization 1998). The IMCI guidelines encourage frequent feeding (including breastfeeding) and offering foods that are preferred especially during illness. It also emphasizes active feeding (Department of Health (South Africa), WHO, UNICEF 2003). This involves feeding infants directly and assisting older children, offering favourite foods and encouraging children to eat when their appetites decrease; avoiding force feeding; using food combinations, different tastes and textures; talking to children during feeding; and minimizing distractions during feeding (LINKAGES Project 1998). These recommendations should also be promoted by the FBDGs.

Regular monthly visits to PHC facilities as outlined in the guidelines on GMP should be reiterated within the FBDGs (PAWC and Maternal and Women's Health and Nutrition Sub-directorates 1999).

Conclusion

There are a number of dietary recommendations that already exist within current nutrition and child health programmes that are being implemented for pre-school children at the primary care level (PAWC and Maternal and Women's Health and Nutrition Sub-directorates 1999; Department of Health (South Africa), WHO, UNICEF 2003). These dietary recommendations are based on extensive research undertaken on children in developing countries. The formulation of FBDGs for preschool children should take cognisance of and be consistent with these existing recommendations. Any gaps that are identified should be addressed by those tasked with developing FBDGs for this age group.

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