

An assessment of preliminary food-based dietary guidelines for infants 6–12 months of age in the Little Karoo area of the Western Cape Province of South Africa

J Van der Merwe^{1,*}, L Bourne² and D Marais¹

¹Department of Human Nutrition, Faculty of Health Sciences, Stellenbosch University and Tygerberg Academic Hospital, South Africa: ²The Medical Research Council, Cape Town, South Africa

Submitted 19 July 2005; Accepted 23 May 2006

Abstract

Objective: This study aimed to assess mother's/caregiver's understanding, practical application and cultural acceptability of a preliminary set of South African food-based dietary guidelines (FBDGs) for children aged 6–12 months living in the Little Karoo area of the Western Cape Province.

Design: An observational, descriptive and cross-sectional study design was followed. Focus group interviews, recorded on videotape, were analysed for qualitative data. Quantitative questionnaires measured knowledge and comprehension of guidelines, perceived constraints to compliance with and importance of guidelines as well as socio demographic data prior to the focus group interviews.

Setting: Afrikaans-, English- and Xhosa-speaking communities of the Little Karoo area of the Western Cape Province of South Africa, including the urban areas of Oudtshoorn, Bongulethu, Bridgton, Toekomsrus and the adjacent rural areas of Dysselsdorp, Calitzdorp, Uniondale, Ladismith and Zoar.

Subjects: Sixty-four mothers or caregivers to infants 6–12 months of age were included in the sample.

Results: Information obtained through the questionnaires supported what was said during discussions. Although perceived as important by the majority of respondents, some of the guidelines were not well understood without prior explanation. Such guidelines were those pertaining to meal frequency and cup feeding, while application of the guideline to prolonged breast-feeding seemed the most problematic.

Conclusions: The FBDGs for this age group will have to be supported by extensive and appropriate educational material to be effective when introduced to the public. The fact that the applicability of the guideline to prolonged breast-feeding seemed to be the most problematic is a cause for concern.

Keywords
Food-based dietary guidelines
Infants
Comprehension
Acceptance
Applicability

Following the 1996 recommendations of a Food and Agriculture Organization (FAO)/World Health Organization (WHO) expert panel¹ for the development of food-based dietary guidelines (FBDGs) unique and specific to the needs of the populations of different countries, a South African FBDG Working Group started, in 1997, to develop a single set of FBDGs aimed at optimal nutrition for all South Africans without special dietary needs over the age of 5 years. Guidelines were developed according to the FAO/WHO specifications to address under- and over-nutrition and to optimise nutrition in disadvantaged as well as affluent communities. The guidelines were based on existing eating patterns, accommodating various South African dietary cultures, and the focus changed from emphasis on nutrients to locally available foods.

A decision was taken by the Working Group to form additional working groups with the aim to develop FBDGs

for specific priority groups, including children under the age of 5 years. The decision to develop separate guidelines for young children was based on the unique needs of children with regard to growth and development and specific diet-related public health issues identified in various South African studies^{2–6}.

It was reported by the South African Vitamin A Consultative Group (SAVACG)² in 1995 that 33.3% of South African children 6–71 months of age suffered from micronutrient deficiencies, especially iron and vitamin A. On average, 9% of South African pre-schoolers had a weight-for-age less than -2 Z-scores and 23% had a height-for-age less than -2 Z-scores, indicating that stunting was a major problem².

The findings of the SAVACG study correlate extremely well with those of the National Food Consumption Survey (NFCs)³ in 1999. With the NFCs, it was established that

*Corresponding author: Email: julanda@intekom.co.za

10.3% of children in the age group 1–9 years in South Africa were underweight and 21.6% were stunted, indicating chronic undernutrition. Children in the age group 1–3 years were the most severely affected. Wasting was shown not to be common in South Africa, with a prevalence rate of only 3.75%³.

In a more recent study of infants from birth to 1 year in Limpopo Province of South Africa⁴, stunting and micro-nutrient deficiencies were also reported to be major nutritional problems, affecting on average >20% and >30% of children, respectively.

The high prevalence of these nutritional problems could be partly due to poor feeding practices from birth onwards, especially in the period following the introduction of complementary foods⁵. Unavailability and unaffordability of balanced complementary foods, especially in rural areas, result in children being fed mainly on carbohydrates⁶, such as maize- and sorghum-meal, the early and inappropriate introduction of which has been shown to be associated with a deficit in linear growth⁴. The early introduction of complementary foods often relates to the mother's perception of the adequacy and the quality of her milk⁵, which also gives rise to the common practice of early introduction of additional milk feeds by bottle, carrying the risk of gastrointestinal diseases^{5,6}.

Consequently, in 2000, a Paediatric FBDG (PFBDG) Working Group was formed with the task to develop FBDGs for children younger than 5 years. This age limit was later raised to 7 years to include all pre-schoolers.

After thorough review of the relevant literature, discussions with various role-players and pre-testing for understanding, a set of preliminary PFBDGs, chosen to address the most pressing paediatric public health issues and considered to be the most appropriate ones for age group subcategories 0–6 months, 6–12 months and 1–7 years, were approved by the Working Group to be subjected to consumer testing.

Differentiation among these age subcategories is appropriate as the dietary needs differ to a great extent among the various age groups. While infants younger than 6 months should be exclusively breast-fed⁷ and children older than 1 year should partake in the usual family meals, the age 6–12 months is marked by the gradual introduction of complementary foods, while the child should still be breast-fed^{8,9}.

As stated in the FAO/WHO document¹, effective implementation of dietary guidelines would only be possible if they are understandable, practical and acceptable. Field-testing the guidelines for these qualities among the target population is therefore a prerequisite for their release¹. This study aimed to assess the mother's/caregiver's understanding and application as well as cultural acceptability of the preliminary PFBDGs specifically designed for the age group 6–12 months (Box 1). It was also the first study in South Africa in which PFBDGs were tested, and was intended to be a pilot study for testing guidelines for this age category which could be repeated in other parts of the country, adapted for different circumstances.

Methods

The FAO/WHO expert panel recommended that FBDGs should be tested among the general public by using focus group interviews of six to eight individuals as a means of gathering qualitative data and that enough groups should be consulted to yield a fair representation of the study population¹. It was therefore considered appropriate that the preliminary guidelines should be tested among groups representative of the different language groups and socio-economic strata in society. Consequently, all women from different language groups and socio-economic backgrounds with infants of 6–12 months of age in the Little Karoo area of the Western Cape Province comprised the study population.

An observational, descriptive and analytical, cross-sectional study design was followed, involving both quantitative and qualitative research. Socio demographic characteristics, believed to exercise an influence on infant nutrition, as well as comprehension of and ability to apply practically PFBDGs, were determined through questionnaires, while insights into beliefs, thoughts, attitudes, motives and behaviours of participants were gained through discussion^{1,10}.

Sampling method

Formal random sampling with concern for adequate sample size would have been inappropriate as, within

Box 1—Preliminary food-based dietary guidelines for the age group 6–12 months

- 1 Enjoy time with your baby
- 2 From 6 months start giving your baby small amounts of solid foods
- 3 Gradually increase your baby's meals to five times a day
- 4 Keep breast-feeding your baby
- 5 Offer your baby clean, safe water regularly
- 6 Teach your baby to drink from a cup
- 7 Take your baby to the clinic every month

qualitative studies, the emphasis is on purposive sampling^{1,11}.

Permission was requested and obtained from the Oudtshoorn Municipality to meet with mothers attending urban clinics in Bongulethu, Bridgton and Toekomsrus, and from the Eden District Municipality to conduct focus group interviews at the rural clinics of Dysselsdorp, Zoar, Calitzdorp, Ladismith and Uniondale. After obtaining the necessary permission, nursing sisters in charge of the clinics were co-opted to hand out invitations to prospective participants, to set suitable dates for focus group interviews in liaison with the investigator and to assign suitable venues. Printed invitations were supplied by the investigator.

Women who fulfilled the inclusion criteria of being the mother or caregiver of an infant in the age group 6–12 months and residing in the Little Karoo area were invited to take part in the focus group interviews with the intention that participants would represent the different language groups found in the area, namely Afrikaans-, English- and Xhosa-speaking groups, and that different levels of education and socio-economic status would also be represented.

Although the number of participants attending the focus group interviews could not be determined beforehand, the number of focus group interviews to be held was limited by logistical issues such as available time and funding, especially as a fair amount of travelling was involved due to the vastness of the study area (Fig. 1).

The Little Karoo area of the Western Cape is a broad valley stretching from Uniondale in the east to Montague in the west and hemmed in by the Swartberg mountain range to the north and the Outeniqua mountain range to the south. This area can be described as an arid semi-desert with an annual rainfall of often <150 mm and

summer temperatures soaring into the mid-forties, while the mountain ranges are often capped with snow during the cold winters.

Ethics approval was obtained from the Human Research Committee, Faculty of Health Sciences, Stellenbosch University. Participation in the focus group interviews was voluntary, and informed consent was obtained from each participant.

Data collection

Data were collected through questionnaires, discussions and video-recordings of the focus group interviews.

The socio demographic questionnaire, adapted from a similar questionnaire used to test the preliminary FBDGs for the South African population older than 5 years¹², assessed variables believed to have an important influence on nutrition, such as employment, education and living conditions.

The quantitative knowledge questionnaire assessed participants' understanding of and ability to apply practically the proposed PFBDGs, identified factors perceived by participants as constraints to the implementation of the proposed PFBDGs and assessed the importance that participants awarded to each of the individual proposed guidelines.

A discussion guideline was designed and translated into all three languages to ensure standardisation of the focus group interviews. The guideline covered aspects such as an explanation of the purpose of the study, assurance of confidentiality and standardised probing questions to facilitate discussions.

Focus groups were fairly homogeneous regarding language and cultural or ethnic group, and lasted from 60 to 90 min while video-recordings were made of the entire proceedings at every focus group interview. Afrikaans and

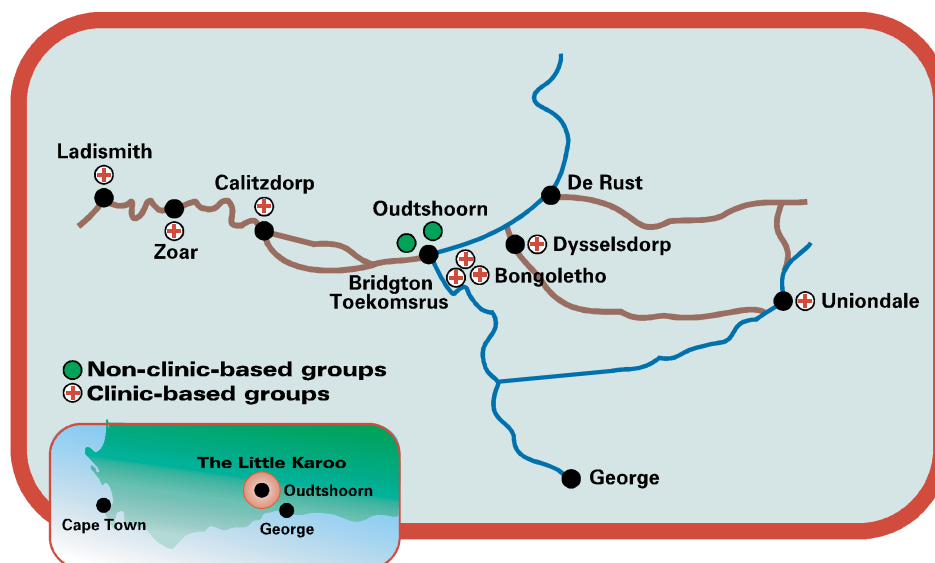


Fig. 1 Map of the Little Karoo area showing the Oudtshoorn urban area and adjacent rural villages

English focus group interviews were facilitated by the investigator, while a Xhosa-speaking community health worker, nominated by the Head of Nursing Services of the municipality of Oudtshoorn and trained for this task by the investigator, facilitated the focus group interview with Xhosa-speaking mothers. Transcripts of the focus group interviews were analysed later to determine the participants' comprehension and interpretation of and general attitude towards the proposed PFBDGs. Through analysis of each video-recording, the group's attitude regarding the preliminary PFBDGs as demonstrated by non-verbal communication could also be assessed.

Two techniques were employed to improve the validity of results obtained by qualitative research, namely the triangulation method and the comparing of results¹⁰.

Triangulation implies that the results obtained by three different methods, in this study being the transcription of verbal discussions, administering questionnaires and videotaping focus group discussions, are compared to see if they complement each other and if agreement between findings would confirm the validity¹⁰. A video of one of the focus group interviews was viewed by a registered dietitian who confirmed the findings as recorded by the investigator. Additionally, a videotape compiled of sections of various group discussions, which illustrated the participants' comprehension of and general attitude towards some of the proposed guidelines particularly well, was shown and peer reviewed at a meeting of the PFBDG Working Group.

Data analysis

Theory-based or template style analysis was used for the qualitative data, where categories or themes were identified in advance from pre-conceptions, combined with an empirical analysis where additional themes crystallised from the data¹¹. Such pre-conceived categories were the themes for probing questions asked by the facilitator during the discussions, for example: 'How much do you consider to be a small amount of food?' and 'What would you describe as suitable solid foods?' Additional themes crystallising from the data were, for example, the question of adding sugar to complementary foods and addition of cereal to milk feeds at a very young age.

Table 1 The composition of the female population of Oudtshoorn as determined in the 1996 census, compared with the composition of the study sample

Language	Female population		Study sample	
	<i>n</i>	Percentage	<i>n</i>	Percentage
Afrikaans	39 835	90.4	56	87.5
English	505	1.2	1	1.5
Xhosa	2378	5.4	7	11
Other	1340	3.0	0	0
Total	44 058	100	64	100

For categorical variables, the number and percentage of study subjects classified into each category were summarised and the numbers of subjects in each category of the different nominal or binary categorical variables were illustrated by graphs. The Pearson χ^2 test was applied to investigate the relationships, if any, between socio demographic variables and categorical variables pertaining to understanding of the guidelines, perceived hindrances to application of the guidelines and perceived importance of the guidelines.

Results

Quantitative results

The study sample, comprised of 64 subjects, took part in 10 focus group interviews, each attended by between three and 11 participants, while the one English-speaking participant was interviewed individually. The sample was considered to be a fair representation of the study population according to the 1996 census figures for Oudtshoorn although Xhosa and English language groups were under-represented in the sample as a result of the population composition of the area at the time (Table 1).

Socio demographic profile of participants

Sixty-four per cent of participants were from rural and 36% from urban settlements. The majority of participants were in the age group 20–30 years. The level of education attained by 48% of participants was grade 7–11, while 23% completed grade 12 of which 9% also attained a post-matriculation level of education. Of the latter, a few also had tertiary education (9%). Two per cent of participants had no formal education and 17% completed grade 6.

Eighty-nine per cent of participants lived in brick houses, had indoor taps and used electricity as a fuel source, while the other 11% lived in informally structured housing/shacks. Of the participants living in brick houses, 56% lived with family or friends, 31% owned their own homes and 13% rented the house they were living in. Forty-eight per cent lived with one or both grandmothers in the house. Forty-eight per cent of participants were single, 36% were married and 16% were in common law relationships. Thirty-nine per cent of participants were

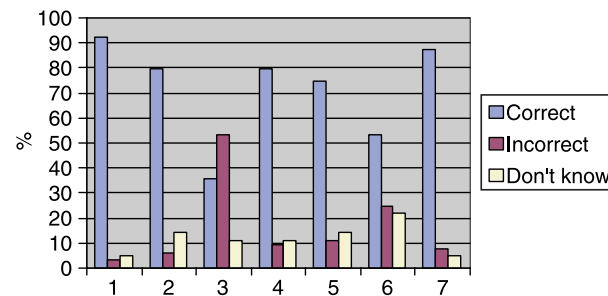


Fig. 2 Comprehension of guidelines 1–7

unemployed, including 28% who were married and were housewives. Twenty per cent were employed part-time and 13% full-time.

Comprehension of proposed guidelines

Questions on guidelines 1, 2, 4, 5 and 7 were each answered correctly by >75% of participants, and all for except the questions on Guideline 6, ‘Don’t know’ responses were <15% (Fig. 2).

Participants experienced the most problems interpreting the guideline on meal frequency (Box 1, no. 3). Fifty-three per cent of participants thought that a baby should not eat more than three times per day and >10% did not know why a baby should be fed five times per day.

No significant association was found between socio-demographic variables and understanding the guidelines, except that mothers from rural areas had a significantly better understanding ($P=0.01$) of the concept of prolonged breast-feeding than mothers from urban areas.

Practical application of proposed guidelines

With every proposed guideline, >10% of participants indicated perceived or real constraints to the application of that specific guideline in their everyday situation (Table 2). The guideline with which the most participants anticipated problems was the one on prolonged breast-feeding, and a number of reasons were offered for inability to comply. Milk that was perceived as ‘being too little’ or ‘has dried up’ was cited as the most common constraint, while being employed, being too tired, not having enough time, the infant preferring a bottle and being instructed by a general practitioner not to breast-feed were respectively cited by some participants as constraints.

Unaffordability and unavailability of complementary foods were indicated by urban-dwelling ($P=0.004$) and unemployed mothers ($P=0.05$) to be the most important hindrances to compliance with Guideline 2, while a lack of knowledge and absence from home during the day were perceived by urban-dwelling mothers ($P=0.0002$) as the main obstacles to compliance with Guideline 3. The only reason offered for not being able to apply Guideline 5 was uncertainty about the safety of water in the area where the participants lived, and the single reason most often mentioned for not being able to comply with Guidelines 1, 6 and 7, respectively, were tiredness and lack of leisure time preventing participants from enjoying time with their babies, the perceived messiness of teaching a small child

to drink from a cup, and fear of criticism deterring participants from attending the clinic.

The perceived importance of the proposed PFBDGs

All guidelines, except Guideline 3, were rated as important by >90% of participants. A significant negative association was identified, however, between being full-time employed ($P=0.02$), having attained a post-matriculation level of education ($P=0.007$) and living with a grandmother ($P=0.01$) and the perceived importance of the breast-feeding guideline.

Qualitative results

A summary of contributions to the discussions in response to certain probing questions regarding each separate guideline follows.

Guideline 1: enjoy time with your baby

This guideline was well understood as participants offered appropriate interpretations such as play and communication, love being communicated in words as well as physical tenderness, and purposefully setting time aside to spend with their children. Various activities such as going for walks and reading stories were also associated with this guideline. More abstract meanings were also offered, such as ‘bonding with the child’ and ‘shaping the child’s character through communication’.

Relating this guideline to dietary aspects, participants felt that a child receiving little attention will develop and learn more slowly even if its diet is adequate, and that feeding time offers an opportunity for one-to-one interaction and communication with the child.

Although having no problem discussing the themes mentioned above, some participants felt that the guideline is vague, and the following suggestions were received from single participants in some groups regarding alternative wording for this specific guideline:

- Give adequate time and attention to your child, while caring for him/her affectionately.
- Feeding times offer good opportunities to give your baby love and attention.
- Spend adequate time with your baby to communicate with him/her and to care for him/her in a loving way.
- Set time aside to spend with your baby and use mealtimes especially to communicate.

Guideline 2: from 6 months start giving your baby small amounts of solid foods

Participants generally understood why an infant at the age of 6 months would need extra food in addition to breast milk. Growth, increased energy needs and resistance against disease were some of the motivations offered.

Overweight was mentioned as a potential problem if solid foods were introduced too early, and the problem of

Table 2 Frequency and percentage of participants indicating an inability to comply with the proposed guidelines ($n=64$)

	Guideline						
	1	2	3	4	5	6	7
Frequency	7	14	15	19	13	8	7
Percentage	10.9	21.9	23.4	29.7	20.3	12.5	10.9

'stretching' a baby's stomach and making him used to large quantities of food was mentioned in three groups. However, cereal added to milk in feeding bottles at an early age was considered by some not to be 'real' solid food, and some participants admitted to starting with this as early as 2–3 months.

Although a number of participants were uncertain about the meaning of 'a small amount', most agreed that it would be that quantity that a child would eat without being forced.

As suitable solid foods, vegetables such as potatoes, carrots, pumpkin, gem squash and butternut were always mentioned first. Thereafter, cereal such as maize-meal porridge, or commercial baby cereals and fruit were mentioned. With the exception of one urban group, meat, chicken and egg yolk were rarely mentioned. However, it was agreed that feeding a baby from the family pot 'without the spices, onions and cabbage' is the most practical solution and, although a few mothers perceived commercial baby foods to be superior, most participants agreed that these foods were generally unaffordable and would also spoil a child's taste for family foods.

A custom among some people in rural areas to give 'meelbol' to infants was reported. Bread flour is baked in the oven to brown it slightly and afterwards it is mixed with water to give as porridge or with more water as an alternative to milk. Cases were discussed where this custom led to serious illness.

Adding sugar to babies' food was discussed in two of the urban groups but, although some mothers do add sugar, all agreed that it would be best if the child could experience and get used to the natural taste of the food.

Guideline 3: gradually increase your baby's meals to five times a day

Although participants understood the infant's increased requirement for food as it grows and becomes more active, and were also aware of the limited stomach capacity of the infant, three meals were generally considered to be the norm, although most agreed that they would give their child mid-morning or mid-afternoon snacks of bread or fruit. These were not considered to be 'proper' meals. In two of the rural discussion groups, participants also admitted that they were unsure of the meaning of 'gradually'.

The following alternatives for this guideline were suggested:

- As your baby becomes older, you should offer healthy mid-morning and mid-afternoon snacks in addition to the three main meals of the day.
- Increase your baby's meals from two or three a day at 6 months to five a day at 12 months.
- Increase the number of meals your child eats daily from three to five as he grows older and needs more food.

Guideline 4: keep breast-feeding your baby

During the discussions, many mothers breast-fed their babies without being deterred in any way by the presence of the video camera. However, there were also a number of participants who bottle-fed their babies during the sessions and admitted to having stopped breast-feeding or to supplementing breast-feeding with formula feeds. Most participants displayed good knowledge of the advantages of breast-feeding.

All breast-feeding mothers claimed to feed their infants on demand and they also felt that it should be the mother's choice for how long she wanted to keep on breast-feeding. The majority of mothers indicated that they intended to breast-feed until the baby 'weans itself' or did not want to drink from the breast anymore.

It was found that in some rural areas myths existed about 'salty milk' and 'weak milk', and that mothers were encouraged by older women, especially grandmothers, to supplement breast milk with formula.

None of the participants had problems understanding this guideline, although in one group it was proposed that the guideline should read: 'Keep on breast-feeding your baby up to 2 years of age'. Although these guidelines are for mothers of babies 6–12 months of age, mothers in this group felt that they would have liked to know in advance for how long they needed to breast-feed.

Guideline 5: offer your baby clean, safe water regularly

Generally this guideline and the motivation for it was well understood, although some suggested that the term 'regularly' was vague and that the guideline should specify how many times per day water had to be given to an infant.

Most participants thought that only boiled, cooled water was safe for an infant, while a few thought that water from a tap is also safe.

'Fluoride' was a concept found to be almost unknown among participants.

In two of the groups, it was suggested that the guideline could be made more understandable by changing the wording to 'Give your baby clean, boiled and cooled drinking water several times a day'.

Guideline 6: teach your baby to drink from a cup

The message of this guideline was understood to be that a child should drink either from the breast or from a cup. Better hygiene was considered the most important reason for teaching a baby to drink from a cup. Problems with dental occlusion and development of dental caries associated with bottle-feeding were never mentioned by any participants in relation to this guideline.

Guideline 7: take your baby to the clinic every month

The reasons that participants offered for attending clinics regularly reflected knowledge of the important function

that a baby clinic fulfils with regard to children's growth and health. Growth monitoring and recording, deworming (although inappropriate for the 6–12 month age group), vaccination, counselling, as well as treatment and referral in cases of illness, were mentioned as motivation for this guideline. It was, however, found that participants in non-clinic-based discussion groups did not consider attending a clinic to be important.

Discussion

It was well understood that good nutrition is only one important aspect of optimum growth and development and that it is equally important for a child to feel wanted, loved and safe¹³.

Tiredness and lack of leisure time cited by urban mothers and those in full- and part-time employment as constraints to enjoying time with their infants can possibly be explained by the fact that most part-time or seasonal workers in the study area are engaged in hard physical labour such as fruit picking. However, possible underlying organic factors, such as iron-deficiency anaemia and insufficient energy intake, should not be overlooked, especially in the face of prevailing poverty and food insecurity in many households in the area¹⁴.

Participants' perceptions of why a child needs complementary foods at 6 months concur with the WHO/UNICEF recommendation, namely that the child of 6 months requires additional nutrition to meet its increasing needs for energy and nutrients^{3,4,15}.

Mothers/caregivers generally understood the concept of feeding the infant until satisfied and not to force feed, concurring with recommendations in the current literature regarding responsive feeding¹⁶.

The practice of adding cereal to bottles of milk feed as early as 2 or 3 months is of concern as this practice is cited in the literature as a risk factor for malnutrition¹⁷. Apart from more nutritious milk being displaced by added cereal, gut permeability as well as the young infant's immature digestive and excretory systems also render the infant vulnerable to damage to the gut epithelium, infections and development of food sensitivities if complementary foods are introduced too soon^{18,19}. Perceiving their breast milk as inadequate, as reported by many mothers in this study, could be a possible explanation for this undesirable practice⁸.

Although cereals, fruit and vegetables, being good sources of energy and some nutrients, especially if enriched with oil or margarine^{3,4}, were correctly perceived as suitable first foods for infants of 6–12 months old, it is a cause for concern that complementary foods such as chicken, meat and egg yolk, rich in protein, iron and zinc, were seldom mentioned²⁰.

Although the guideline on meal frequency was the least well understood of all the proposed PFBGDs, the problem seems to be more related to the terminology used than to

the concept of feeding the infant five times per day. During discussions, participants came to understand that due to the infant's small gastric capacity combined with a high energy need, the meal frequency should be increased¹⁶. However, almost 20% still considered it to be unimportant.

The breast-feeding of many infants during the focus group interviews concurred with current recommendations that babies should be breast-fed on demand^{21,22}.

As participants demonstrated good comprehension of the benefits of breast-feeding and the importance of this guideline, it was surprising that in the second part of the quantitative knowledge questionnaire almost 30% of participants reported constraints to application of this guideline, the most general of which was that their breast milk was considered inadequate. While undesirable practices such as supplementing breast milk with formula feeds may lead to a diminishing supply of breast milk¹⁶, the notion of having too little milk, or milk of a lesser quality, may also be just a perception. There is no way of measuring the amount of breast milk that an infant takes in and therefore it is difficult for a mother to estimate whether it is enough¹⁶. Incorrect breast-feeding techniques might be another possible explanation for the perception of too little milk. Ineffective sucking and the consequent frequent demands for feeding may create the impression that the mother's milk is too little²³.

Breast-feeding participants' intentions to keep on breast-feeding until the child weans itself is supported by recommendations in the current literature that breast-feeding should be promoted and sustained for as long as possible especially in communities where children are particularly at risk for malnutrition¹⁶.

While good comprehension of the hygienic aspect of cup feeding corresponds to findings in the literature that feeding bottles carry a risk for bacterial contamination and subsequent morbidity, especially in disadvantaged settings²⁴, none, however, related this guideline to dental and oral health, although a direct relationship between the use of feeding bottles and childhood dental caries has been demonstrated^{25,26}. Occlusion of the primary dentition has also been shown in another study²⁷ to be influenced by the use of a feeding bottle.

The perceived benefits of regularly attending health facilities (clinics), as discussed in focus group interviews, were confirmed in the literature on clinic services^{28–31}.

Limitations of the study

Although the sample was representative of the population in the greater Oudtshoorn area, saturation was not reached within the Xhosa- and English-speaking subgroups. As participation was voluntary, it happened that one language group was well represented while the above-mentioned language groups were under-represented.

Furthermore, qualitative studies have an inherent subjective nature which, in the absence of scientific

standards, or criteria with which to compare the results, renders validation of results difficult. A solution to this problem was sought, however, by administering quantitative questionnaires, which proved to support the qualitative findings of the focus group discussions, and to have part of the qualitative material peer reviewed.

Conclusion

Participating mothers were very receptive towards the idea of PFBDGs which would make nutrition knowledge more accessible to the lay public. Furthermore, PFBDGs would provide health professionals and community health care workers with an easy-to-use educational tool, and regional and national health authorities could find the information gained helpful to prioritise possible information-disseminating campaigns.

It has been established in this study that, with adequate complementary educational material, the general public would have no difficulty understanding the proposed guidelines, while perceived hindrances can in many cases be overcome with improved knowledge. Although some mothers will experience very real and practical difficulties complying with certain guidelines, it is believed that the PFBDGs will provide direction to mothers of infants, enabling them to do the best they possibly can for their children within the means at their disposal.

The fact that the applicability of the guideline on prolonged breast-feeding seems to be the most problematic is a cause for concern and warrants special attention.

Recommendations

As a result of the study described above, the following recommendations are proposed.

- Guidelines should be accompanied by complementary and extensive additional educational material.
- The needs within communities should be assessed with regard to possible information campaigns and in particular mothers who are not attending health facilities (clinics) on a regular basis should be targeted through the media.
- As the difficulty that participants experienced with the interpretation of certain guidelines was not related to any perceived complexity of the guideline, but rather to words which participants did not know the meaning of (Guideline 3 'gradually', Guideline 5 'regularly') or considered too vague (Guideline 1), suggestions for alternative wording of some of the guidelines, offered by participants in this study, need to be considered.

Recommendations for further studies

It is recommended that further consumer testing of the proposed PFBDGs is done in areas where

under-represented language groups are better represented in order to obtain a fuller understanding of the situation as well as to validate the results obtained in the present study.

Acknowledgements

The authors wish to thank the Medical Research Council of South Africa for financial assistance which made it possible to conduct this research in effective and innovative ways.

References

- 1 World Health Organization (WHO). *Preparation and Use of Food-based Dietary Guidelines*. Report of a Joint FAO/WHO Consultation. Technical Report Series No. 880. Geneva: WHO, 1998; 27–44.
- 2 The South African Vitamin A Consultative Group (SAVACG). *Children Aged 6–71 Months in South Africa, 1994: Their Anthropometric, Vitamin A, Iron and Immunisation Coverage Status*. Isando, Gauteng: SAVACG, 1995.
- 3 Labadarios D, Steyn N, Maunder E, Mac Intyre U, Swart R, Gericke G, *et al.* The National Food Consumption Survey (NFCSS) – children aged 1–9 years, South Africa, 1999. *South African Journal of Clinical Nutrition* 2001; **14**: 62–75.
- 4 Mamabolo RL, Alberts M, Mbenyane GX, Steyn NP, Nthangeni NG, Delamarre-van de Waal HA, *et al.* Feeding practices and growth of infants from birth to 12 months in the central region of the Limpopo Province of South Africa. *Nutrition* 2004; **20**: 327–33.
- 5 Faber M, Oelofse A, Kriek JA, Benade AJS. Breastfeeding and complementary feeding practices in a low socio-economic urban and a low socio-economic rural area. *South African Journal of Food Science and Nutrition* 1997; **9**: 43–51.
- 6 Zöllner E, Carlier ND. Breast feeding and weaning practices in Venda, 1990. *South African Medical Journal* 1993; **83**: 580–3.
- 7 World Health Organization (WHO). *Report of the Expert Consultation on the Optimal Duration of Exclusive Breast Feeding*. Geneva: Department of Nutrition for Health and Development, WHO, 2001; 1–2.
- 8 World Health Organization (WHO). *Complementary Feeding of Young Children in Developing Countries: A Review of Current Scientific Knowledge*. Program of Nutrition Family and Reproductive Health. Geneva: WHO, 1998; 167–78.
- 9 World Health Organization (WHO). *Complementary Feeding: Family Foods for Breast Fed Children*. Geneva: Department of Nutrition for Health and Development, WHO, 2000; 1–17.
- 10 Katzenellenbogen JM, Joubert G, Abdool Karim SS. *Epidemiology – A Manual for South Africa*. Cape Town: Oxford University Press Southern Africa, 1997; 176–81.
- 11 Malterud K. Qualitative research: standards, challenges, and guidelines. *Lancet* 2001; **358**: 483–8.
- 12 Love P, Maunder E, Green M, Ross F, Smale-Lovely J, Charlton K. South African food-based dietary guidelines: testing of the preliminary guidelines among women in Kwa-Zulu Natal and the Western Cape. *South African Journal of Clinical Nutrition* 2001; **14**: 9–19.
- 13 American Academy of Pediatrics. Family pediatrics: Report of the Task Force on the Family. *Pediatrics* 2003; **111**: 1541–71.
- 14 Department of Health. *Southern Cape/Karoo Region Nutrition. Integrated Nutrition Program: Information on Malnutrition*. Pretoria: Department of Health, 2003.
- 15 UNICEF. *Complementary foods and feeding: nutritional companion to breastfeeding after six months* [online], 15 August 2003. Available at <http://www.unicef.org/programme/breastfeeding/food.htm>

- 16 Dewey KG, Brown KH. Update on technical issues concerning complementary feeding of young children in developing countries and implications for intervention programs. *Food and Nutrition Bulletin* 2003; **24**: 5–28.
- 17 Delpont SD, Becker PJ, Bergh A. Growth, feeding practices and infections in black infants. *South African Medical Journal* 1997; **87**: 57–61.
- 18 Schepers A. Nutritional care in food allergy and food intolerance. In: Mahan LK, Escott-Stump S, eds. *Krause's Food Nutrition and Diet Therapy*. Philadelphia, PA: WB Saunders Company, 1996; 848.
- 19 Host A. Primary and secondary dietary prevention. *Pediatric Allergy and Immunology* 2001; **12**(Suppl. 14): 78–84.
- 20 Daelmans B, Martines J, Saadeh R. Conclusions of the global consultation on complementary feeding. *Food and Nutrition Bulletin* 2003; **24**: 126–9.
- 21 Lanigan JA, Bishop JA, Kimber AC, Morgan J. Systematic review concerning the age of introduction of complementary foods to the healthy full term infant. *European Journal of Clinical Nutrition* 2001; **55**: 309–20.
- 22 Dewey KG. Nutrition, growth and complementary feeding of the breastfed infant. *Pediatric Clinics of North America* 2001; **48**: 87–104.
- 23 Lang S, Lawrence CJ, Orme RLE. Cup feeding: an alternative method of infant feeding. *Archives of Disease in Childhood* 1994; **71**: 365–9.
- 24 Lucas B. Normal nutrition from infancy through adolescence. In: Queen Samour P, King Helm K, Lang CE, eds. *Handbook of Pediatric Nutrition*, 2nd ed. Gaithersburg, MD: Aspen Publishers Inc., 1999; 99–120.
- 25 Opinya GN. Dietary habits and oral health in infancy and early childhood of Kenyan children at the Kenyatta National Hospital Paediatric Demonstration Unit. *East African Medical Journal* 1989; **66**: 567–72.
- 26 Behrendt A, Sziegoleit F, Müller-Lessmann V, Ipek-Özdemir G, Wetzel WE. Nursing bottle syndrome caused by prolonged drinking from vessels with bill-shaped extensions. *Journal of Dentistry for Children* 2001; (Jan/Feb): 47–50.
- 27 Charcut SW, Allred EN, Needleman HL. The effects of infant feeding patterns on the occlusion of the primary dentition. *Journal of Dentistry for Children* 2003; **70**: 197–203.
- 28 Provincial Administration of Western Cape (PAWC)–Department of Health (DOH). *Policy Guidelines for the Nutrition Supplementation Programme of the Health Facility Based Nutrition Programme*. South Africa: PAWC-DOH, 2003.
- 29 Western Cape Department of Health (DOH) and Social Services. *Paediatric Case Management Guidelines: Growth Monitoring, Malnutrition and Vitamin A Supplementation*. South Africa: Western Cape DOH and Social Services, 2000.
- 30 Department of Health. *Vitamin A Supplementation Policy*. Circular no. H42/2002/.
- 31 Department of Health. *Integrated Nutrition Programme (3): A Foundation for Life*. South Africa: Department of Health, 2002.