

Breast feeding practices of mothers with children (aged 0-36 months) in a rural area of South Africa

A qualitative approach

Rozanne Kruger and Gerda Gericke

OPSOMMING

Hierdie studie was 'n verkennende ondersoek na die borsvoedingspraktyke van moeders / versorgers wat twee babaklinieke in die Moretele-distrik besoek. Beide kwantitatiewe en kwalitatiewe navorsingsmetodologieë is toegepas. Individuele en fokusgroeponderhoude is vir data-insameling gebruik. 'n Geriefsteekproef (N = 174) moeders / versorgers is vir die onderhoude getrek. Ses ouderdomskategorieë is aan die hand van bekende dieetveranderingsfases gebruik.

Die antropometriese resultate het op groeipatroon-abnormaliteite gedui wat op 18 maande 'n piek bereik het (suboptimale groei) en weer teen 24 maande gestabiliseer het. Dieetinnames het 'n beperkte verskeidenheid getoon en was voldoende behalwe wat yster, kalsium, sink, niasien, vitamien D en A betref.

Borsvoeding was die keusevoeding, maar dit was moeilik om die borsvoedingspraktyke (voedingstye en -frekwensie, duur van voedings) akkuraat te bepaal. Vaste voedsel is vroeg reeds (voor 4-6 maande) (87%) in die dieet ingesluit weens die moeders se persepsie van 'n honger baba. Graan (48%) en water (16,7%) is eerste vir fisiologiese/gesondheidsredes bygevoeg. Borsvoeding is op 18-24 maande (83,3%) gestaak. Die meeste kinders (34,5%) het vanaf 7-12 maande 'n gemengde gesinsdieet ontvang.

Die gevolgtrekking is dat moeders se kennis oor die voordele van borsvoeding, voedingspraktyke, en redes vir die insluiting van vaste voedsel ontoereikend is. Onderrig oor babavoeding / -voedingspraktyke (spesifiek borsvoeding en spening) word aanbeveel om chroniese wanvoeding en voedingsprobleme in hierdie gemeenskap te voorkom.

— Mrs Rozanne Kruger

Department of Consumer Science, University of Pretoria

— Ms Gertruida J Gericke

Division Human Nutrition, University of Pretoria

INTRODUCTION

Health problems, especially those related to chronic malnutrition, have been causing concern worldwide (Kibel & Wagstaff, 1995:96; Ocloo, 1993; Patel & Pettifor, 1992). Infants and toddlers are the most common victims of malnutrition because of their vulnerability in the growth phase (Huffman & Martin, 1994; Patel & Pettifor, 1992; Walker, 1990). Inadequate quantities of breast milk or inappropriate weaning practices contributed to malnutrition that could cause stunted growth at a later stage (Steyn, Badenhorst, Nel & Ladzani, 1993; Patel & Pettifor, 1992; Walker, 1990).

Breast feeding is accepted as the primary means of nourishing an infant and of preventing infant morbidity and mortality in developing countries. The superiority of breast milk for infants has been confirmed: BREAST IS BEST (Kibel & Wagstaff, 1995:84; Wells, 1995; Lipsky, Stephenson, Koepsell, Gloyd, Lopez & Bain, 1994; Prentice, 1991; Walker, 1990; Ng'andu & Watts, 1990).

The prevalence of breast feeding in urban areas of the developing world seems to be declining (Zetterström, 1994). Several researchers have found that breast feeding is supplemented from an early age (even in the first month) with either milk or water, fruit juice, tea, gruel, cereal, fruit and vegetables (Piwoz, Creed de Kanashiro, Lopez de Romaña, Black & Brown, 1996; Roberts, Cleaton-Jones, Richardson, Sinwell & Lucas, 1995; Huffman & Martin, 1994; Walker, 1990; Underwood, 1984). According to Steyn et al (1993:10), infant feeding practices clearly affect a child's nutritional status, health and growth. There should be increased focus on the feeding of infants and toddlers to help reduce chronic malnutrition and mortality (Huffman & Martin, 1994).

This article focuses on the breast-feeding practices of mothers who attended two baby clinics in the Moretele district (North-West Province of South Africa). For the purposes of this research, breast feeding was defined as the intake of breast milk as the only source of food (Kibel & Wagstaff, 1995:84; Guthrie & Picciano, 1995:545; Prentice, 1991; Walker, 1990).

The weaning diet was defined as the intake of solid food in combination with either breast milk or formula milk (Guthrie & Picciano, 1995:561; Huffman & Martin, 1994), and nutritional knowledge implied the knowledge of infant feeding of the mothers or caregivers in

the study (Guthrie & Picciano, 1995:544; Naidoo, Padayachee & Verburgh, 1993). Breast-feeding practices included the choice, frequency and scheduling of breast feeding, attitudes to breast feeding and the reasons for these practices.

The discussion takes place within a quantitative and qualitative paradigm. Breast feeding is discussed in terms of the nutritional adequacy of the diet as well as the growth patterns of the children in the study. The results revealed that education on breast-feeding practices is of crucial importance to the health of children in this community.

QUANTITATIVE METHODOLOGY

The data for the quantitative analysis were collected according to standardised procedures (Lee & Nieman, 1993:50-52, 63-68, 122-131). A structured questionnaire was used to collect information on three components, namely biographic, anthropometric and dietary intake. The height, weight and head circumference of the child was measured, and all the anthropometric data on the child's growth chart were recorded.

Dietary-related data were gathered by means of a 24-hour recall method of habitual food intake (Lee & Nieman, 1993:50-52, 63-68, 122-131). One trained interviewer (moderator) at each clinic conducted the individual interviews and also took the measurements. Descriptive statistics were collected and the results were presented by means of frequency distributions on a comparative basis between different age groups.

QUALITATIVE METHODOLOGY

The data were collected by means of a structured in-

terview schedule (in view of the transcultural nature of the research) during focus-group interviews (in view of the sensitive issues that were discussed) (Denzin & Lincoln, 1994:211-212; Stewart & Shamdasani, 1990:39). Six major topics on the nutrition of children were identified from the literature and included in the interview schedule. Four topics covered feeding practices (one of which was breast feeding and the focus of this article), and two topics were nutrition-related knowledge and attitude to nutrition.

Mothers / caregivers were interviewed in six age groups, classified in terms of known diet change phases (see Table 1) (Hendricks & Badruddin, 1992:125).

A trained moderator at each of the two clinics conducted thirteen focus-group interviews with three groups in the 0-3/12 age category and two each in the other five categories. A debriefing interview was conducted with a transcription of the focus-group data immediately after each interview. All the valuable information the moderator could contribute was therefore recorded. An independent specialist (a dietician from the same cultural group who was fluent in the language used during the interview) was consulted to verify the translation and the quality of the data. The final transcription of the data was compiled in a suitable format to compare the results in the different categories and between the different age groups (cross-interview analysis) (Morgan, 1988:66).

When the data transcription had been finalised, categories were created to encode the data for analysis. The structured interview schedule was used to assemble the data (Morgan, 1988:66). The researcher created the data categories, based on the theory. The category terminology is presented in Table 2.

TABLE 1: DESCRIPTION OF THE AGE CATEGORIES USED AND THE NUMBER OF CHILDREN IN THE STUDY GROUP

AGE CATEGORY (months)	CLASSIFICATION OF THE AGE CATEGORY	NUMBER OF CHILDREN		
		MAKAPANSTAD (n)	MATHIBESTAD (n)	TOTAL (N)
0-3.0 months (0-3/12)	exclusive breast feeding	13	17	30
3.1-6.0 months (4-6/12)	breast feeding and grains	13	12	25
6.1-9.0 months (7-9/12)	breast feeding, grains, soft fruits and vegetables	16	14	30
9.1-12.0 months (10-12/12)	breast feeding, grains, soft fruits and vegetables, and meat	11	16	27
12.1-24.0 months (13-24/12)	breast feeding (supplement) and regular solid food	20	17	37
24.1-36.0 months (25-36/12)	no breast feeding, only solid food	12	13	25
TOTAL		85	89	174

TABLE 2: DATA CATEGORIES USED FOR CONTENT ANALYSIS

DATA CATEGORIES
References to any kind of environment were coded as either: <ul style="list-style-type: none"> ◆ <i>micro environment</i> - closest people to the respondent (individual) like her family, or members of the same household or very close friends with whom interaction took place on a daily basis, ◆ <i>meso environment</i> - people or objects in the community that could be seen as intermediary contacts. Interaction was less regular, like the clinic staff or neighbours.
<i>Health evaluations included the subjective evaluation of the child's clinical appearance, his body measurements and eating behaviour:</i> <ul style="list-style-type: none"> ◆ <i>clinical evaluation</i> - involved the subjective evaluation of physical appearance, good general health, no diseases present, ◆ <i>anthropometrical evaluation</i> - referred to the objective measurement of body size, weight and proportions at the clinic and included concepts like falling within applicable weight and height ranges, ◆ <i>food intake behaviour</i> - referred to eating or food consumed and included concepts like the mother's / caregiver's perception of a healthy appetite, or when a child is eating properly.
Subject specific categories were created for coding reasons given by the mothers / caregivers for their practices in terms of broad themes like physiological, nutritional, health, financial reasons, etc. Responses given as "good for you" / "good for the baby" were sometimes categorized in one or more of the subject specific categories because of the non-specific nature of the response.
Physical items were classified according to the type of item, e.g. types of milk, water, food, drinks and utensils.
Time related responses were categorized in terms of hours, days, weeks, etc.
Methods for different actions were categorized separately according to type e.g. formula preparation, food storage, etc.
Volumes of food or drink used or given to the child were given in mL.
Reasons for practices, knowledge or attitudes that did not fit into the subject specific categories were categorized separately in terms of the relevant situation / theme.
Correctness of reasons were categorized in terms of: <ul style="list-style-type: none"> ◆ <i>science based responses</i> - any response that was based on a well accepted scientific fact, ◆ <i>misconceptions</i> - any response that was based on some unknown or culturally based (scientific unsound) concept, or which was not based on a scientific fact or on wrong interpretations of scientific concepts.

Ethnography and content analyses were used for data analysis purposes. Two coders were used for data categorisation in the content analysis. The preparation of data involved a process of unitising, sampling and recording of reduced data. Unitising required the formation of different analysis units (see Figure 1), sampling involved the selection of data to be presented, and recording required coding according to the specified data categories.

The results of the content analysis were presented in tabular format to communicate and describe significant patterns in the data (Morgan, 1988). Ethnography was used by means of direct quotations to impact on the content analysis and to verify the data (Morgan, 1988:64).

Specific standardised or pretested measuring instruments were used to ensure the reliability and validity of both the quantitative and qualitative measures. A pilot study was conducted to refine the instruments for the quantitative methodology. Each individual interview instrument was tested twice: once in a pilot study and once in an interviewer training session.

One specific moderator from the same ethnic group was exclusively used at every clinic. The moderators

evaluated all the measuring instruments in terms of their degree of difficulty, understandability and applicability. The focus-group interview schedule was tested twice: once during the development phase and once during the training of the moderators. The moderators were thoroughly trained on research procedures. An independent specialist verified the translations and the quality of the data produced in the transcriptions. Two independent coders were used to record the data in relevant data categories (Kruger, 1999:65-66, 68, 91-92; Neuman, 1997).

STUDY GROUP

This research was undertaken to obtain baseline data on communities and their nutritional practices in areas where no such information was available. The North-West Province - and specifically the Hammanskraal area (Moretele district) - were identified as an area where no baseline data were available. Two non-urban areas, Mathibestad and Makapanstad, approximately 30 kilometres outside Hammanskraal proper, were identified. The clinic in the Mathibestad area was approximately 30 kilometres from Hammanskraal proper, and the clinic in the Makapanstad area was

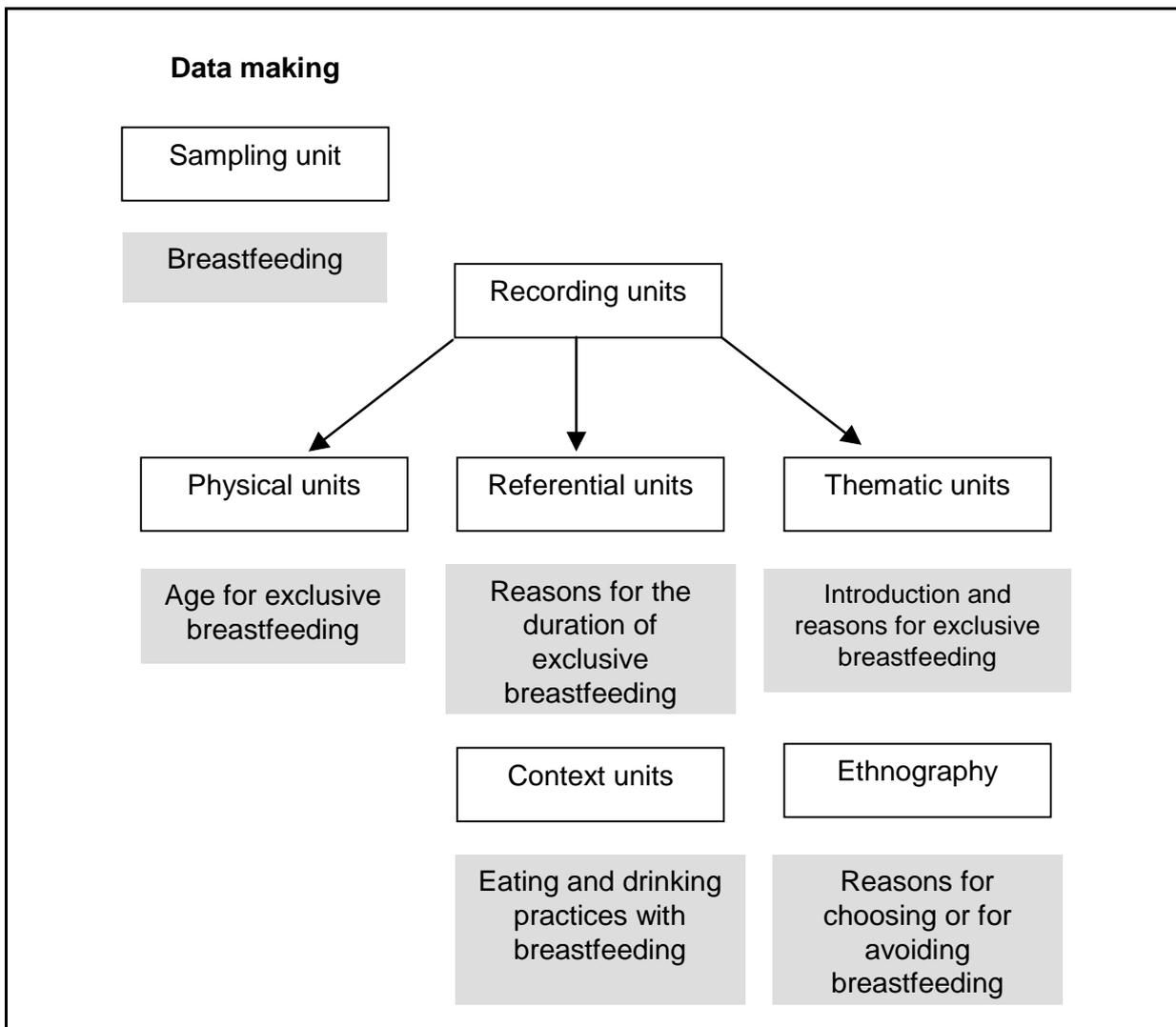


FIGURE 1: THE DATA REDUCTION PROCESS – DATA MAKING

approximately 10 kilometres further into the more rural part of the district.

The population consisted of mothers / caregivers with children between the ages of 0-36 months, living in the Moretele district. The data were collected from September 1995 to March 1996.

Convenience sampling was used according to the age-based classification described above (Hendricks & Badruddin, 1992). The sample was taken from mothers / caregivers (N = 174) and their children who visited the baby / child or immunisation clinics in Makapanstad and Mathibestad on Tuesday mornings.

Description of the study group

The most common ethnic group was the Tswana (71,3%, n = 124) followed by the Shangaan (11,5%, n = 20), the North-Sotho (6,3%, n=11) and Pedi (5,7%, n=10), and the Ndebele, Zulu, Venda, South-Sotho and Xhosa groups made up the remaining 5,2% (n=9).

Forty-two per cent (n = 73) boys and 58% (n = 101) girls were included in the study group.

The children were mostly accompanied by their mothers (85,1%, n = 148). Young babies (0-9 months old) were least often accompanied by caregivers (26,9%, n = 7). A considerable number of mothers (32,2%, n = 56) had a matric qualification, and one mother (0,6%) had a postmatric qualification. The occupations of the mothers - according to their own perceptions - revealed that a few were working (12,6%, n = 22). Some were still at school (12,1%, n = 21) and therefore not able to work.

Most of the mothers were housewives (40,2%, n = 70) and came from the Makapanstad area (98,6%, n = 69). Most of those who were unemployed / looking for work (35,6%, n = 62) came from the Mathibestad area. Very few of the children's fathers (34,5%, n = 60) lived with their families. However, those who did not live with their families did contribute financially to the family (81,5%, n = 141). More fathers contrib-

uted to the care of the younger children than of the older children.

RESULTS

Quantitative results

Anthropometry The percentiles of the National Centre for Health Statistics (NCHS) (Hamill, Drizd, Johnson, Reed, Roche & Moore, 1979) and the reference data for the weight and height of the children (World Health Organisation (WHO), 1975) were used as standards for evaluation of the data. Certain anthropometrical trends were identified.

Weight increased for both sexes during the first year, with a slight decline at 12-24 months, recovering to birth percentiles at 36 months. The decline in weight-for-age occurred at approximately age 18 months for all the children.

Length increased or remained the same for girls during the first year, with a decline at 12-24 months, recovering to birth percentiles at 36 months. Length decreased for the boys with a prominent decline at 12-24 months, never recovering to the birth percentile. The most prominent dip in the growth curve occurred at the age of 18 months to below the fifth NCHS percentile and to below the third WHO percentile, indicating failure to thrive.

Head circumference increased in both sexes up to age 6 months with a decline at 12-24 months, recovering or even increasing at 36 months. The decline in growth of the head was again most apparent at age 18 months.

Dietary intake As the ages of the children varied between 0 and 36 months, breast feeding appeared frequently on the 24-hour recalls. Breast milk intake was calculated to ensure a full analysis of food intake. The number of times the baby was breast-fed during the day was recorded on the 24-hour recalls, referring to exclusive breast feeding or to breast feeding in addition to food intake. Breast milk values for the different feeding regimes were then added to the food intake data to complete the nutrient intake data set (Dickin, Griffiths & Piwoz, 1997:C1-C4, Guthrie & Picciano, 1995:547).

The nutrient analysis from the 24-hour recall intakes was evaluated in terms of two sets of reference values, namely the WHO (World Health Organisation, 1975) and RDA values (67% cut-off) (Hamill et al, 1979). The children received adequate intakes for energy, protein, carbohydrates and fats, but inadequate intakes for iron, calcium, zinc, niacin, vitamin D, and in some age groups vitamin A (these nutrients are all important for growth).

The most common food items were stiff and soft maize porridge, sugar, tea and brown bread, followed by Nespray and soya mince. Food items infrequently consumed included fruit like bananas, apples, oranges, juice and vegetables like spinach, tomato, onion, cabbage and margarine, oil and peanut butter. It

was established that there was little variety in the diets of the children.

Qualitative results

The qualitative results are presented in four parts, namely breast feeding as the feeding choice, its introduction, duration and implementation, and eating and drinking practices during breast feeding.

Breast feeding as the feeding choice All the subjects in all the focus groups felt that a baby should be breast-fed. There were no negative responses, indicating that all the mothers intended to breast feed - even if circumstances forced them to bottle feed.

The most frequently mentioned ($n = 31, 70,5\%$) reason for breast feeding babies was health (eg good health, strength, and breast feeding is best). The second most frequently mentioned category was for immunological reasons ($n = 5, 11,4\%$) (to prevent illness). The reasoning of the mothers / caregivers for their choices is reflected in the following ethnographic descriptions (in the mother or caregiver's own words).

Health reasons ($n = 31, 70,5\%$ of all responses) were mentioned most frequently. However, very generally:

- ◆ "a baby that receives breast milk will be strong and healthy"
- ◆ "for the baby to grow well"
- ◆ "breast is best"
- ◆ "if you do not breast feed, the child will get kwashi-orkor"
- ◆ "breast feeding gives the baby strength".

Responses dealing with immunological advantages ($n = 5, 11,4\%$ of all responses) included:

- ◆ "it prevents infections"
- ◆ "it prevents illnesses"
- ◆ "when the child is sick you can easily feed her with breast feeding"
- ◆ "breast milk doesn't have any germs"
- ◆ "for the child not to become sick".

The responses on immunological advantages were often linked to the health idea. The mothers / caregivers felt that breast feeding would be good for the general health of the child and therefore prevent disease.

The nutritional ($n = 2, 4,5\%$ of all responses) and psychological reasons ($n = 2, 4,5\%$ of all responses) that were mentioned were:

- ◆ "breast milk has protein and vitamins"
- ◆ "because they have all the vitamins"
- ◆ "the breast-fed child is getting a lot of love from the mother"
- ◆ "it builds the bonding between the mother and the child".

It was concluded that the mothers were not fully informed about the advantages of breast feeding but had been exposed to mention of the importance of

breast feeding. It could be valuable for these mothers to learn more about **all** the advantages of breast feeding for both the mother and the baby as such knowledge could cause an attitude change and promote breast feeding in the community (Kibel & Wagstaff, 1995:85-87; Wells, 1995; Tan & Jeffery, 1995; Lambert & Hall, 1995a; Lipsky et al, 1994; Zetterström, 1994; Prentice, 1991; Ng'andu & Watts, 1990; Covey, 1985; Walker, 1978).

Mothers / caregivers were also asked to explain why a baby would not be breast-fed. Many (50%) did not even answer this question, implying that babies should be breast-fed (breast feeding being the first choice). Some mothers explained that breast feeding was not suitable for babies under certain circumstances, and referred to breast discomfort (n = 6, 27,3% of all responses) and illness of both mother and baby (n = 4, 17,4% of all responses). Some mothers (n = 11, 47,8% of all responses) could not say why they would choose another type of feed. This choice could be based on advice from clinic / hospital staff who failed to explain to them why a particular feed choice was recommended.

Ethnographic descriptions for breast discomfort:

- ◆ "when the mother has problems with the breast, for example a breast abscess"
- ◆ "the mother may be suffering from 'rush' or some other disease"
- ◆ "maybe when the mother is having sores on the breast".

Responses dealing with either a sick mother (n = 2, 8,7% of all responses) or a sick child (n = 2, 8,7% of all responses):

- ◆ "maybe the mother is sick and advised by the doctor not to breast feed"
- ◆ "when the child gets ill"
- ◆ "when they are sickly".

A number of other general responses (n = 8, 35,9% of all responses):

- ◆ "when the mother has problems with the breast, for example a breast abscess"
- ◆ "maybe when the mother is having sores on the breast"
- ◆ "when the mother have fear to breast-feed the child - she doesn't want her breasts to 'fall down', so she only give a bottle"
- ◆ "maybe enough milk is not coming from the breast".

The mothers had some knowledge about the reasons for stopping breast feeding. Issues that could be addressed in nutrition education though, are those of milk production (especially concerning colostrum), breast feeding and illness (which in most cases need not stop), and breast care.

Introduction and duration of breast feeding In determining when breast feeding was introduced to the baby, mothers were prompted about initiating breast feeding immediately after birth. Most of the

subjects (n = 40, 59,7% of all responses) indicated that breast feeding should start either directly or soon after birth (n = 13, 19,4% of all responses). "Soon after birth" was interpreted as directly after birth, as soon as medical examinations and procedures have been completed, in other words within four hours after the baby's birth. "Directly after the baby is born" indicated that breast feeding should start in the delivery room (which would probably only be possible in a lenient clinic / hospital, in a hospital that adopted the Baby-Friendly Hospital Initiative, or in the case of a home birth).

A few mothers (n = 6, 9,0% of all responses) also mentioned starting breast feeding half a day after birth. Most mothers felt that breast feeding should start as soon as possible, within one full day after birth (n = 61, 91,1% of all responses).

Various reasons were submitted to justify these decisions, and these have been classified into four main categories. **Firstly** physiologically based responses (n = 23, 46,0% of all responses) where hunger and thirst (noticeable because the baby cried) and rest for the baby were mentioned. This category was related to previous answers about breast feeding "directly after birth" and "soon after birth". **Secondly**, hospital / clinic procedures were mentioned as reasons for delaying a start with breast feeding (n = 10, 20,0% of all responses). These answers included observation of the baby, bathing of the baby, or given time schedules. The delay was seldom longer than four hours ("soon after birth"). The mothers of older children (10-12 months, 13-24 months, 25-36 months) most frequently responded in this category. **Thirdly**, a perceived lack of milk was given as a reason for delaying breast feeding (n = 6, 12,0% of all responses)(one or more days), as colostrum was not considered the same as breast milk. **Fourthly**, the mother was allowed time to rest after the delivery (n = 6, 12,0% of all responses) before breast feeding was initiated.

Implementing breast feeding This aspect refers to frequency and duration of feeding of each breast-feeding session and gives an indication of the quality of the diet of the child. The moderators tried to determine during the focus-group interviews how long and how frequently - during the day and during the night - the babies were actually put to the breast. The same problems were experienced as with the 24-hour recall and considerable probing was required to determine frequency and duration.

The probes for frequency specifically asked the subjects to consider only *feeding* times, and not the times breast feeding was offered to comfort / pacify. The most popular response in all the groups was four-hourly feeds (3x/day) (n = 23, 41,1% of all responses). It was discouraging that seven of the eleven responses in the 0-3 month age category mentioned three, two or one feed per day. This implied inadequate intake for babies in this age group, as they relied on breast feeding for their total nutritional intake. The risk of nutritional inadequacy was therefore high.

It was not possible to establish a pattern from these results, as the responses in the different age categories varied. Although breast feeding on demand was mentioned as the best feeding choice for a new-born baby, it was not the most popular or common response ($n = 9$, 16,1% of all responses). Two-hourly and three-hourly feeding regimens received an equal number of responses ($n = 7$, 12,5% of all responses). Ethnographic descriptions for day-time feeding regimens included:

- ◆ "it depends on your routine"
- ◆ "can't estimate - only when the child needs it"
- ◆ "kort-kort"
- ◆ "when the child cry"
- ◆ "if at home, the baby breast feeds at any time".

Demand feeding during the night (with "night" specified as 12 night-time hours) elicited more responses ($n = 18$, 32,7% of all responses) than demand feeding during the day ($n = 9$, 16,1% of all responses). This was also the most common response. The next most popular responses included a six-hourly regimen ($n = 14$, 25,5% of all responses) and a four-hourly regimen ($n = 12$, 21,8% of all responses). In all these categories the responses were given in all the age categories except the 4-6-month group where there were no responses for six-hourly feeds. In the 0-3-month age group, most mentioned the twice-per-night feeding regimen ($n = 4$, 7,1% of all responses). The babies usually remained in bed with their mothers and were fed when they woke or cried. The mother consequently did not always know when the baby drank. It appeared from the responses that demand feeding in this case referred to pacifying or comforting the child, rather than feeding the child. Ethnographic descriptions reflecting night feeds were vague:

- ◆ "every time the baby wakes up"
- ◆ "whenever the baby wants it"
- ◆ "can't estimate - when the child wants it"
- ◆ "many times - whenever the baby's mouth comes in contact with the breast, he starts sucking"
- ◆ "kort-kort".
- ◆ "when she cries".

Very few of the subjects monitored and controlled the duration of breast feeding sessions. Mothers allowed their babies to decide when they wanted to stop feeding ($n = 34$, 60,7% of all responses), or they kept on breast feeding until the baby fell asleep ($n = 13$, 23,2% of all responses). The latter option was also the most popular among mothers with older children (10 months and older). The least number of re-

sponses was about the mother deciding on the duration of a breast-feeding session ($n = 9$, 16,1% of all responses).

It could be concluded that "breast is best" was well accepted in these communities, but that proper demand feeding was practised less. Attitudes to breast feeding were very positive, but in an absent-minded way. The baby was put to the breast, and the mother was not concerned with the duration of the feed or the amount of milk the baby drank. The mothers were more concerned about the child being happy and looking well. The breast was given to the baby at every opportunity (when the child cried or as a pacifier) rather than for actual feeding purposes. Hence the answer of "kort-kort" (often) for practically all the 24-hour recalls of children's dietary intakes.

Feeding on demand of very young babies - who should be exclusively breast-fed to the age of 4-6 months (Kibel & Wagstaff, 1995:83; Wells, 1995; Lipsky et al, 1994; Hendricks & Badruddin, 1992; Prentice, 1991; Walker, 1990) - was not common. It was almost impossible to determine the duration of a feeding session as the mothers could seldom answer this question. The mothers were also hardly aware of the amount of milk that the baby was consuming due to their indifference regarding the time on the breast or if the baby was suckling for pacifying or for feeding purposes.

Eating and drinking practices with breast feeding

The mothers / caregivers were asked whether the baby should get anything else to eat or drink while they were breast feeding. The response to this probe was positive ($n = 26$, 100% of all focus groups) in all the groups. Exclusive breast feeding seemed rare in these communities, as solid food was introduced at a fairly early age (see Table 3).

Solid foods were introduced to most babies in the study group ($n = 134$, 87%) before the recommended age of 4-6 months (Wells, 1995; Lambert & Hall, 1995b; Hendricks & Badruddin, 1992). Only 13% ($n = 20$) started on solid foods at the recommended age. By age 4 months most babies in this study group ($n = 151$, 98,1%) were eating solid foods. The reasons mentioned most frequently were that the mother did not have enough milk to satisfy the baby ($n = 70$, 45,8% of all responses), that the baby was crying ($n = 35$, 22,9% of all responses), and that the mother did not cope well with breast feeding ($n = 20$, 13,1% of

TABLE 3: OMPARISON OF THE DIFFERENT AGES FOR INTRODUCING SOLID FOOD (N=154) IN THE TWO CLINICS

AGE FOR SOLID FOOD INTRODUCTION	CLINICS					
	MAKAPANSTAD (n=76)		MATHIBESTAD (n=78)		BOTH (n=154)	
	n	%	n	%	n	%
1 - 2 months	22	29.0	11	14.1	33	21.4
3 months	41	54.0	60	76.9	101	65.6
4 months	13	17.0	4	5.1	17	11.0
5 months	0	0	1	1.3	1	0.7
6 months	0	0	2	2.6	2	1.3

all responses). Crying seemed to be interpreted as the mother not having enough milk. They assumed that the breast milk alone did not satisfy the hunger and solid food was therefore introduced to the diet to supplement the breast milk. "Not having enough milk" was mentioned by 68,6% (n = 105) of the mothers.

When the frequency of adding foods or drinks to breast feeding was probed, most of the subjects (n = 21, 50,0% of all responses) mentioned three feeds per day. All the age categories responded to this option.

It was also important to determine whether the additional food given to the breast fed babies interfered with the quality of the breast feeding, since additional food before a feeding session would inhibit the breast milk intake due to satiety. Most mothers in all the age groups (n = 20, 83,3% of all responses) answered that the ideal time to give additional food was after a breast-feeding session. This practice did not interfere with breast milk intake.

The item most commonly added to the breast feeding was a soft porridge of maize meal (n = 19, 28,8% of all responses). Commercial cereals like Nestum and Cerelac were also mentioned (n = 13, 19,7% of all responses). Water was also added to the child's intake (n = 11, 16,7% of all responses). Fruit and vegetables, commercial and fresh, were also added to the diet. Milk was seldom added to supplement breast feeding.

The stated reasons for the choice of these additional items in the baby's diet were concerned with physiological (n = 13, 37,1% of all responses) and health aspects (n = 14, 40,0% of all responses). The physiological reasons were related to texture (ease of chewing and swallowing) and satisfying hunger or thirst (soft maize meal porridge or commercial cereals and water, or commercial "juices"). The health reasons were generally concerned with what was good or nutritious for a baby, making a baby strong and healthy, and causing weight gain (eating porridge or cereal, fruit and vegetables). All the other reasons the subjects submitted were concerned with the importance of giving babies water every day. Some of these reasons were not scientifically sound, for example to help them digest their food (water was therefore frequently offered after breast feeding) or to remedy a sunken fontanel.

Ethnographic descriptions of the reasons for adding these foods to the babies' diets were presented in the food categories used for data reduction.

Cereals were most commonly added to a baby's diet. Raw cereals like maize meal and oats were more popular than commercial products like Nestum or Cerelac, mainly because of their availability and price. Most of the focus groups said they gave soft porridge (*bogobe*) to the babies. It was usually given without additions, but some mothers, especially of older children, said they sometimes added milk or the thin wa-

tery gravy (*sop*) in which the meat has boiled. Their reasons for adding cereals to their babies' diets covered a wide spectrum. The physiological reasons included texture, easy eating and preventing hunger:

- ◆ "it is soft"
- ◆ "introduce soft foods and gradually change the texture as the baby grows"
- ◆ "the baby will swallow it easily"
- ◆ "to satisfy hunger"
- ◆ "that they can't get hungry"
- ◆ "she will not be satisfied with breast feeding only".

Health category reasons reflected general health concerns:

- ◆ "it is good for the baby"
- ◆ "to make the baby strong and healthy" (*matla*)
- ◆ "for the baby to gain enough weight"
- ◆ "it has all the nutrients that are good for the baby" (*dikotla*).

However, soft porridge was also considered to have other special functions, mostly misconceptions:

- ◆ "to build the body"
- ◆ "they keep the bones strong".

Water was the second most frequently added item. Many reasons were listed for adding water to the baby's diet daily. Only two of these are scientifically sound:

- ◆ "for her body to have enough water"
- ◆ "for her not to be thirsty".

The other reasons were misconceptions:

- ◆ "to help the food during digestion"
- ◆ "to pass the feeds"
- ◆ "if you do not give enough water, the child is weak and the fontanel will go down - this is a problem".

They believed that water had to be consumed after every meal to aid digestion and to help pass the food through the digestive system. Although the mothers were ignorant in this regard, the practice had no impact on appetite or stomach capacity that could influence food intake.

Fresh fruit / vegetables were rarely added to the babies' diet. If fruits were given, bananas and oranges were mostly used. Commercial fruit juices (artificial and sweetened) were also given to the children. The fresh vegetable intake was limited. Of those given, potatoes, sweet potatoes and carrots were mostly used. Purity products, if they could afford them, were also given to the babies because of their texture and nutritional content. Among the health reasons mentioned:

- ◆ "it is good for the baby"
- ◆ "it has all the vitamins and nutrients that is good for the baby" (*dikotla*)
- ◆ "these foods are healthy".

A few misconceptions existed about vegetables:

- ◆ "potatoes and sweet potatoes help to build the body"
- ◆ "Purity products aid in bones becoming strong".

It could be concluded that it was quite common to supplement the breast feeding with other food and drink. All relevant factors should be considered in making positive suggestions about suitable nutrition education:

- ◆ Timing and frequency of additions
- ◆ Describing the added items
- ◆ The reasons for adding them.

The mothers added food to their babies' diets far too soon - and usually for the wrong reasons. If breast feeding alone did not keep the child happy, soft porridge was immediately added to the diet to prevent hunger and to keep the child happy.

Cessation of breast feeding All these responses were in the age category 12 months and older ($n = 18$, 100%), indicating that younger children were not taken off the breast completely. Most mothers / caregivers ($n = 15$, 83,3% of all responses) indicated that breast feeding was stopped completely between age 18-24 months. The reasons for ending breast feeding included health issues ($n = 9$, 81,8% of all responses) (eg a suitable age to stop breast feeding, the child was big enough to be weaned) rather than physiological reasons. Most of the mothers ($n = 10$, 34,5%) said that their children received a mixed family diet by age 7-9 months.

DISCUSSION

The children in both the Mathibestad and Makapanstad areas appeared to grow in accordance with their birth percentiles. At age 3 years they were very close to their birth percentiles in terms of weight and head circumference, but all showed a growth decline (weight for age and head circumference) at approximately age 18 months, which was the age that most children were taken off the breast completely. This possibly indicated a period of poor food intake thus leading to general growth failure at that age. Average length measured below the birth percentile (indicating suboptimal growth)(Kibel & Wagstaff, 1995:29, 98), and weight-for-height (indicating normal or stunted growth) was normal (Kibel & Wagstaff, 1995:98).

Growth pattern abnormalities occurred between age 12-24 months, peaking at 18 months, probably due to final weaning from the breast to a full family diet that consisted of poor high-biological-value protein (Huffman & Martin, 1994; Walker, 1990; Ng'andu & Watts, 1990; Underwood, 1984). In view of the recovered length growth, the growth pattern does not indicate stunting but failure to thrive at the age of total weaning from the breast.

These results correspond with previous findings in South Africa (Faber, Oelofse, Kriek & Benadé, 1997). This growth pattern confirms the theory on the weanling's dilemma (Huffman & Martin, 1994; Walker, 1990; Ng'andu & Watts, 1990; Underwood, 1984), associated with poor growth at age 6 months to 2 years, whereafter the nutritional status subsequently stabilised again (Huffman & Martin, 1994; Ng'andu & Watts, 1990). The growth pattern appeared to be

worse in the Mathibestad area with higher rates of growth faltering. However, no pronounced wasting or stunting was found.

The macronutrients, including total energy intake, were consumed in adequate quantities. The average protein intake (10-11% of total energy intake) compared well with the recommended 12-15% of total energy intake, the carbohydrates (67-75% of total energy intake), to the recommended >55%, and the fat intake (21-25% of total energy intake) to the recommended <30% (Guthrie & Picciano, 1995:37-48; Lee & Nieman, 1993:25-26). The protein and kilojoule intakes were sufficient, but marginally so.

More plant protein than animal proteins were consumed in all the age groups, causing a lower high-biological-value protein intake in these children. There should be more emphasis on protein sources in the diet, focusing on affordable, high-biological-value proteins to sustain growth and development. The vitamin A intake was adequate, except in the 13-36 month age groups in both geographical areas.

The intake of iron-rich foods was fairly low, but still adequate if fixed cut-off points were used in the RDA analysis. Intakes of other micronutrients were adequate (in terms of both sets of standards), except for vitamin B₃, vitamin D, zinc and calcium. It is imperative to attend to the intakes of iron, zinc, calcium and vitamin D in these communities as all of them play an important role in growth. All these nutrients should be present at the same time to optimise growth (Guthrie & Picciano, 1995:574).

Breast feeding on demand is marketed worldwide as best for new-born babies (Kibel & Wagstaff, 1995:84; Wells, 1995; Lipsky et al, 1994; Prentice, 1991; Walker, 1990; Ng'andu & Watts, 1990). The qualitative research on breast-feeding practices did not reveal major differences between the two clinics. Defining breast feeding practices in clear-cut terms in these communities seemed difficult. It was concluded that the mothers from Makapanstad delayed starting breast feeding for one or more days, mainly because of the perceived absence of milk as colostrum was not considered suitable for babies. The mothers from Mathibestad started breast feeding within half a day of birth. This finding corresponds with research in KwaZulu-Natal and in the Western Cape where breast-fed infants were put to the breast for the first time the day after birth (Faber et al, 1997).

Generally speaking, the mothers / caregivers were very positive about breast feeding, albeit in an absent-minded way. It was almost impossible to obtain accurate data on breast milk intake in these communities because the mothers / caregivers could neither report accurately on the frequency of feeds nor on the duration of specific feeds. They were less concerned about the volume of milk the baby received than about its happiness and physical appearance. The babies were breast-fed for several reasons: to stop crying, to quench thirst, to feed, to put to sleep. If breast feeding

alone did not keep the child happy, solid foods were immediately added to prevent hunger and to keep the baby happy.

All the focus groups responded positively to questions about giving babies something in addition to breast milk. Exclusive breast feeding was rare in these communities, a finding that corresponded with previous research results (MacIntyre & Ruhle, 1997; Zöllner & Carlier, 1993). The babies were given additional food / drink three times per day. Three months was deemed an appropriate age for introducing solid food. Most mothers / caregivers (63%) started giving their babies solid food from age 2-3 months, and a mixed family diet was common by age 7-9 months. The results about adding solid food to the breast milk diet, the transitional period, and the final weaning age compared to the weaning recommendations are presented in Table 4.

It could be concluded that mothers / caregivers rarely practised exclusive breast feeding. Breast feeding with solid food was common and continued until age 18-24 months. Mothers / caretakers added solid food to the diets of their small babies far too soon, usually unnecessarily and for the wrong reasons. The risk of diarrhoea, malnutrition or other illnesses increased with the early introduction of other food (Huffman & Martin, 1994).

CONCLUSION

Based on this research, the qualitative research approach is recommended for research on nutrition as it supplements / strengthens quantitative research findings. The results of this investigation provided insight into practices, knowledge and attitudes regarding breast feeding. These findings substantiate recommendations aimed at improving the feeding practices and/or the nutritional status of children.

The nutrition knowledge of the mothers / caregivers in the research group appeared inadequate and this relates to unsatisfactory breast-feeding practices. Strict cultural beliefs and practices further impeded the quality of the feeding practices of their children (eg discarding colostrum and a consequent perception of inadequate milk flow). Young mothers / caregivers often find it impossible to ignore the advice of elders or peer groups (Kibel & Wagstaff, 1995:96-97; Jelliffe & Jelliffe, 1979). Nutrition knowledge about infant feeding should be changed as a first step to implementing improved breast-feeding practices. Nutrition education should focus on imparting the necessary information to change current knowledge, attitudes and practices. These rural women should also be motivated to change their behaviour if they wish to improve the health status of themselves and their children in the long term (Kibel & Wagstaff, 1995:16-20; Huffman & Martin, 1994, 38).

An interactive nutrition education programme should be developed and implemented for these communities

and its health workers to improve breast feeding practices. The mothers / caregivers should be made aware of the value of breast feeding and how to refine and / or improve their current practices. Interactive nutrition education, taking best practices into consideration, should address:

- ◆ the value of starting breast feeding soon after birth
- ◆ exclusive breast feeding
- ◆ the value of a specific breast feeding routine
- ◆ breast feeding on demand
- ◆ the correct age and the correct reasons for adding complementary foods
- ◆ the nutritional value and functions of specific foods in the diets of babies
- ◆ the weaning procedure (Guthrie & Picciano, 1995:544; Lambert & Hall, 1995b; Huffman & Martin, 1994; Hendricks & Badruddin, 1992).

Improved breast-feeding practices will ensure adequate growth, prevent growth retardation during the critical period of 12-24 months, and prevent other nutritional problems.

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TABLE 4: COMPARISON OF RESULTS TO THE BASIC WEANING RECOMMENDATIONS (adapted from Hendricks & Badruddin, 1992:130)

Weaning foods	Months									
	0	3	6	9	12	15	18	21	24	
Breast milk	~~~~~*****									
Staple weaning food and other grains	-----*****									
Soft fruits and vegetables	-----*****									
Meats and other protein rich foods	-----*****									
	Ideal					Study group				
	Transitional period -----					*****				
	Given regularly -----					~~~~~				

Reflections

1. Breast milk should be given exclusively for the first four to six months. In developing countries breast feeding should be encouraged throughout the first two years, even if it provides only a small part of total intake. *In this study group breast milk was given exclusively for the first one to two months only, but continued to the age of eighteen to twenty-four months.*
2. Beginning at four months and no later than six months, the infant is gradually introduced to complementary / weaning foods. The sequence of introduction is not precise and schedules will vary since each infant will progress at his/her own rate. A staple food that is kilojoule dense and adequate in protein is important and variety is essential in providing for complete nutritional needs. Iron, zinc, vitamin D, and vitamin A-rich foods should be emphasized. Initially, complementary foods are given once a day, then gradually the frequency is increased so that the infant is eating two to four meals per day by about six months of age. Infants over six months of age need to eat meals and snacks about four to six times a day in addition to breast feeding. *In this study group cereals were introduced as early as two months. The next two foods introduced were fruits and vegetables. Meat was generally not given to small children. These children consumed adequate quantities of energy and all the macronutrients. Vitamin A intakes were adequate to the age of 12 months, where-after it was lower than the reference value. Intakes of iron, zinc, niacin, vitamin D and calcium were inadequate. Children followed a regime of three meals a day from very early on and snacks were not introduced to the children.*
3. To avoid bacterial contamination, only freshly cooked or freshly peeled or washed foods should be used. The hands of both the food provider and child should be washed before handling food. *In this study group foods not finished at one mealtime were kept for later use under unsuitable conditions e.g. in the shade or on the floor, increasing the risk for infection.*
4. Throughout the latter half of the first year of life, variety in taste and texture of diet is expanded. As the child approaches one year of age, he should be encouraged to feed himself, and by two years of age, he should be consuming a varied diet from the family diet with choices from each of the food groups. *In this study group the children were introduced to the full family diet by the age of twelve to eighteen months. However cultural practices were adhered to with regard to the inclusion of a limited variety of nutritious foods.*

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