Factors influencing high socio-economic class mothers' decision regarding formula-feeding practices in the Cape Metropole

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Keywords: Breast-feeding; breast milk; formula feeding; formula milk; complementary food

Abstract

The aims of the study were to identify the reasons why high socio-economic class women in the Cape Metropole decide not to breast-feed; to evaluate whether the type and volume of infant formula selected by the mother was appropriate for her infant's current age and to identify the factors that influence the decision-making process when deciding which infant formula to feed her infant.

An observational descriptive study with consecutive sampling was utilised. Data of 55 mothers with infants aged 0 to 6 months that were not currently breast-fed was captured in day care centres and private clinics situated in the Cape Metropole. Data was collected by means of a self-administered questionnaire available in Afrikaans and English.

The majority of mothers (80%) decided only after the birth of their infant to rather opt for formula feeding. Evident factors that were identified as barriers to breast-feeding include a lack of knowledge and experience (38%) as well as a lack of facilities at public places (75%) and at work (71%) to breast-feed. Perceived benefits of infant formula included that the father could help with the workload (67%) and does not feel left out (38%), the mother knows what volume of milk is received (84%) and the convenience if the mother is working (64%). The mothers were overall not concerned about possible side-effects of breast-feeding and did not feel that their breasts were physically not of optimal physiology to breast-feed.

One of the greatest challenges to support, protect and promote breast-feeding is to ensure that information sources give scientifically correct information to the uninformed or information-seeking mother in a standardised and positive manner.

S Afr J Clin Nutr 2009;22(1):37-44

Introduction

Breast milk is widely acknowledged as the most complete form of nutrition for infants due to the fact that it provides the necessary elements for optimal growth and development.[1–4] Breast milk has nutritional, immunological, biochemical, anti-allergic, anti-infective, intellectual, developmental, psychological, psychosocial, economic and environmental benefits for the mother and/or her infant.[1-3,5–8] Breast-feeding provides in all the infant's nutritional needs and is therefore the preferred feeding option for all infants. Exclusive breast-feeding is therefore advocated as the sole source of nutrition for the first six months of an infant's life.[1,9,10]

The literature indicates that a mother's decision to breast-feed or formula feed her infant results from a complex interaction of various factors (Figure 1).[2,5,11–15] The mother's current circumstances may therefore result in her opting to rather formula feed her infant, despite the known benefits of breast-feeding.

A national survey conducted in 1998 in South Africa, The South African Demographic Health Survey (SADHS, 1998), found that in the first three months of life, only 10% of infants were exclusively breast-fed, while the rate of bottle-feeding was 48.3% nationally. In the age group 0 to 3 months, 17% of infants were never breast-fed and only 2% of children aged 4 to 6 months were still exclusively breast-fed. Interestingly, mothers with no education had a median exclusive breast-feeding duration of 1.1 months, whereas mothers with an education higher than Grade 12 had an exclusive breast-feeding duration of 0.4 months (Figure 2).[16]

In another national study, the South African Vitamin A Consultative Group (SAVACG, 1994) found that the percentage of infants never breast-fed averaged 12% in South Africa, while it averaged 24% in the Western Cape province. This study also indicated that there is a tendency for mothers with a higher education to never breast-feed their infants. In this study 16.5% of mothers with a tertiary education tended to never breast-feed their infants, while only 9.8% of mothers with a lower than Grade 7* education tended to never breast-feed their infants.[17] As better education is invariably linked with higher income, it seemed logical to target the higher socio-economic class in this study.[18]

* Regarding the level of education, Grade 12 is equivalent to 12 years of schooling; Grade 7 is equivalent to 7 years of schooling.

The main aim of the study was therefore to identify the factors that influence high socio-economic class mothers' decisions regarding infant-feeding practices. The objectives were to identify the reasons why high socio-economic class women in the Cape Metropole decide not to breast-feed; to evaluate whether the type and volume of infant

Figure 1: Conceptual framework of factors that affect a mothers' choice of infant-feeding practices [2,5,11-15]

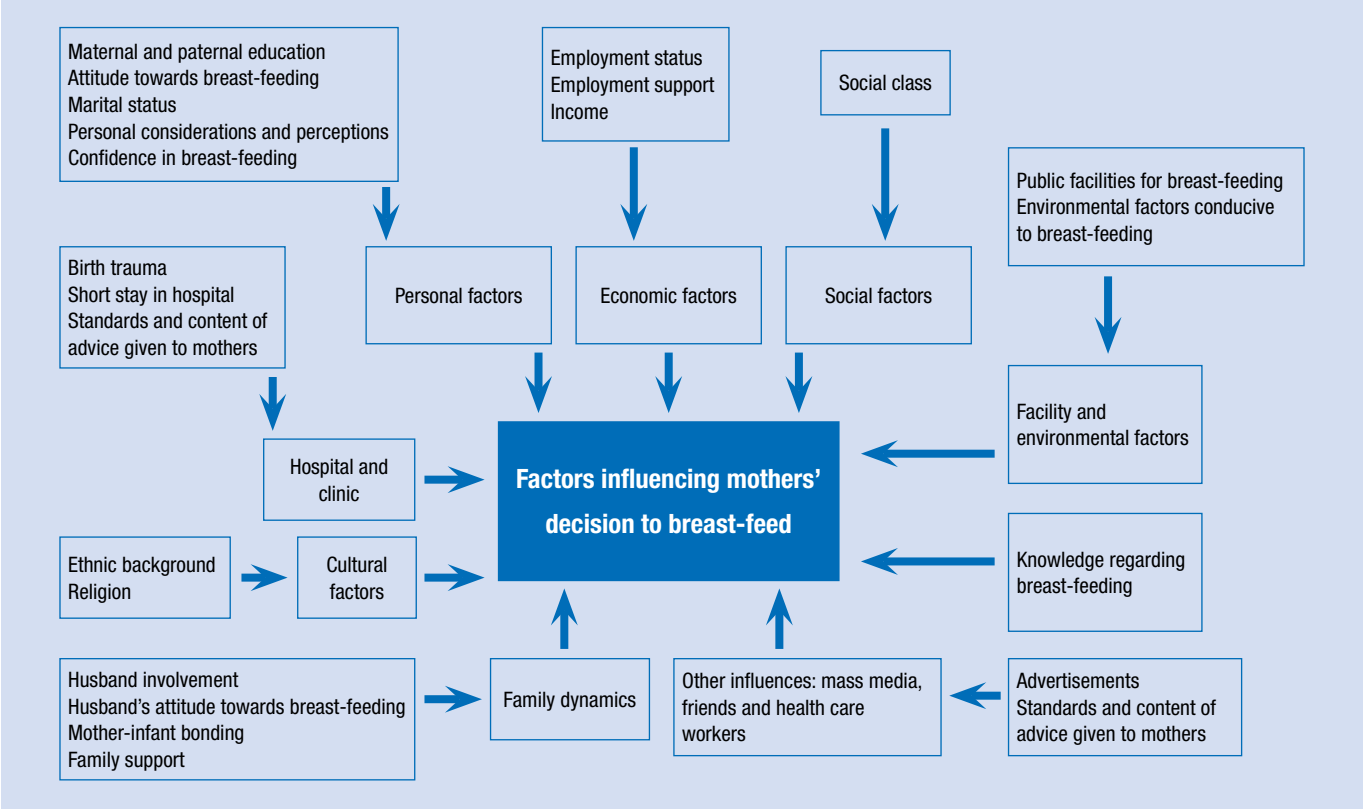
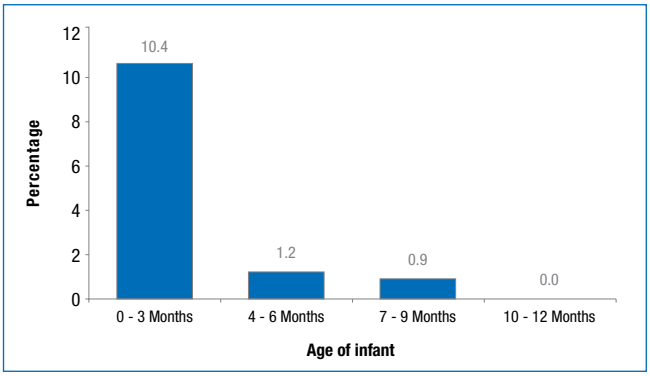


Figure 2: The prevalence of exclusive breast-feeding among infants younger than 12 months: SADHS (SADHS 1998)



formula selected by the mother is appropriate and to identify the factors that influence the decision-making process when deciding which infant formula to feed her infant.

Materials and methods

Ethics approval was obtained from The Human Research Committee of the Faculty of Health Sciences, Stellenbosch University (Project Number N05/02/022). The study was conducted as an observational descriptive study. Day care centres, private clinics and private practising paediatricians serving mainly mothers from the higher socio-economic classes of the Cape Metropole were selected as recruitment sites.

Inclusion criteria for the recruitment sites were that they accommodate babies younger than six months of age and were situated in the higher socio-economic areas of the Cape Metropole (areas as classified by the local municipality) and were privately operated. Clinics actively promoting exclusive breast-feeding practices were excluded from the list of private baby clinics. The compiled list comprised 46 day care centres, 10 private clinics and 67 private practising paediatricians situated throughout the Cape Metropole. Verbal consent was obtained from 29 of the identified recruitment sites to administer the questionnaires to mothers at their facilities after sending a letter explaining the objective and events of the study.

Inclusion criteria for mothers were consent to participate; infant younger than six months; feeding only an infant formula (with or without complementary food); annual household income before tax ≥ R101 652‡; capable of understanding, writing and speaking either English or Afrikaans and mother's age above 18 years.

‡ In South Africa there are not clear cut-off values for defining a person as belonging to a high-income group. Both Statistics South Africa and the Unilever Institute of Strategic Marketing, however, recommended this cut-off value.

Data was collected by means of a self-administered questionnaire that was pilot-tested at a day care centre, private clinic and private practising paediatrician in Stellenbosch for face validity. The questionnaire comprised six sections dealing with the socio-demographic information of the mother, information on the infant, previous infant-feeding practices (if applicable), feeding practices of the current infant, information sources to the mother and information on the infant formula the mother prefers. Both open-ended and closed-ended questions were included. A Likert scale comprising four possible answers to statements was used to determine attitude. The questionnaire consisted of 29 open-ended, 55 closed-ended questions and 39 Likert scale questions.

Prior to the commencement of the study, questionnaires and self-addressed, prepaid envelopes were distributed among all the participating recruitment sites. The person administering the questionnaire, usually the receptionist, was trained by the investigator regarding the procedure to administer these documents. While the mother was waiting for her appointment or fetching her infant, she was asked to complete the questionnaire and return it in the sealed envelope to the person administering the forms. Alternatively, if she opted to complete it at home, she was asked to post the forms after completion.

Prior to inclusion in the study, the person administering the questionnaire explained the purpose and extent of the study to the participant. All eligible participants that voluntarily completed the questionnaire were included in the sample. The questionnaire contained no identifying questions (e.g. name, surname and address) and therefore the anonymity of all participants was ensured.

Data was captured electronically with Microsoft Excel 2003 and controlled for precision of data transfer with regular cross-referencing. The Centre for Statistical Consultation at Stellenbosch University assisted with data analysis using Statistica 7.0, 2004.

Descriptive statistics such as frequency and cumulative frequency tables were constructed for all variables. Histograms or pie charts were constructed for all variables involved. If the variables were ordinal or continuous, means, medians, quartiles, minimum, maximum and standard deviations were calculated. When comparisons were made between nominal variables (i.e. categorical variables), categorical data analysis was used.

The mother's response to the question regarding the mixing procedure of the infant formula was used to calculate the formula milk dilution method employed. The provided medical history and chronological age of the infant was used to assess the appropriateness of the infant formula milk that was chosen.

Results

A total of 29 (23.6%) facilities agreed to participate in the study and 10 questionnaires were provided to each consenting facility; therefore a total of 290 questionnaires were distributed.

In total 59 questionnaires were returned, of which 55 could be used. Two questionnaires were incomplete and two questionnaires belonged to mothers of adopted babies. During the data-collection period, a small number of mothers were approached to complete the questionnaire at more than one facility, e.g. at the clinic and at the day care centre. In these instances the mother was not allowed to complete the questionnaire a second time.

Characteristics of the participating mothers and infants:

Two-thirds of the mothers (69.1%) were aged between 26 and 35 years and they were mostly of the white ethnic grouping (81.8%) (Table I). The mothers had at least a Grade 12 education and 80% had further qualifications. Only 21.8% of the mothers were not working and almost half (49.1%) of the mothers had an annual household income equal to or above R223 788. The majority of the mothers (89.1%) were married and almost half (43.6%) of the mothers had a second or third child. Most infants were born by means of a caesarean section (63.6%) at full term (83.6%) and almost half

Table I: Characteristics of the participating mothers (n = 55) and infants (n = 55)

Variable	n	%
Age: (Years)		
20 – 25	5	9.09
26 – 30	18	32.73
31 – 35	20	36.36
36 – 40	12	21.82
Ethnic group:		
African	1	1.82
Coloured	8	14.55
Indian	1	1.82
White	45	81.81
Highest education obtained:		
Grade 12	11	20.00
Diploma/Certificate	21	38.18
Degree	11	20.00
Postgraduate qualification	12	21.82
Current employment:		
Full-time job	35	63.64
Part-time job	2	3.63
Homemaker	12	21.82
Student	0	0
Unemployed	0	0
Self-employed	6	10.91
Marital status:		
Single	2	3.63
Married	49	89.10
Cohabiting	3	5.45
Separated	1	1.82
Number of children:		
One	31	56.36
Two	22	40.00
Three	2	3.64
Gestational age at birth: (Weeks)		
< 30	1	1.82
30 – 35	2	3.64
36 – 40	46	83.63
> 40	6	10.91
Birth weight: (Kilograms)		
< 2.50	1	1.82
2.50 – 3.00	9	16.36
3.10 – 3.50	27	49.10
3.60 – 4.00	14	25.45
> 4.00	4	7.27
Current weight distribution (WfA): (Percentile)		
< 5th	2	3.64
5 – 10	9	16.36
10 – 25	11	20.00
25 – 50	13	23.64
50 – 75	15	27.27
75 – 90	4	7.27
90 – 95	1	1.82
> 95th	0	0
Type of birth:		
Normal vaginal	20	36.36
Caesarean section	35	63.64
Medical problems since birth:		
Yes	15	27.27
No	40	72.73

(49.1%) of the infants' reported weight was between 3.1 kg and 3.5 kg at birth. Almost half of the infants (45.5%) had a chronological age of 21 to 24 weeks and 50.9% had a current weight-for-age distribution (calculated from the reported current weight of the infant) between the 25th and 75th percentile. Most infants (72.7%) had not experienced any medical problems since birth.

Factors influencing the mother's choice to not breast-feed:

Personal factors

Mothers' attitudes were determined using an agree/disagree four-point Likert scale to statements indicating personal factors in the literature that may influence the mothers' infant-feeding decision. The majority of mothers did not agree with the statements indicating that they did not enjoy breast-feeding (n = 40; 72.7%), considered breast-feeding repulsive (n = 49; 89.1%), would feel embarrassed if someone saw them breast-feeding (n = 39; 70.9%) or that they did not want to breast-feed due to others' bad experience (n = 51; 92.7%).

The possible side-effects of breast-feeding on the mother in general did not concern the mothers, as the majority of mothers (n = 41; 74.5%) felt that the physical pain and discomfort associated with breast-feeding did not discourage them. Most mothers agreed that they were not worried about "leaking" (n = 46; 83.6%), engorgement (n = 40; 72.7%) or feeling run down (n = 40; 72.7%).

It seems that the physical appearance of the majority of mothers did not influence their infant-feeding practices, as most mothers did not think that their breasts were too small or too large to breast-feed (n = 48; 87.3%) and that they could not breast-feed due to too small nipples (n = 54; 98.2%) or inverted nipples (n = 51; 92.7%). They reported not being afraid that they would loose their figure with breast-feeding (n = 51; 92.7%) but one in three mothers (n = 19; 34.5%) was afraid that breast-feeding would make their breasts sag. Most mothers (n = 49; 89.1%) disagreed that they underwent previous breast surgery and therefore could not breast-feed. Almost all the mothers disagreed (n = 52; 94.5%) that they were afraid that breast-feeding would increase their chances of getting breast cancer.

Economic factors

While mothers (n = 39; 70.9%) indicated that the facilities at work are not conducive to support breast-feeding, most mothers (n = 35; 63.6%) also indicated that formula feeding is convenient if they are working.

Social factors

Mothers seemed divided when asked whether breast-feeding ties women down socially, but more than half (n = 32; 58.2%) indicated that successful breast-feeding depends on social support. The majority of mothers (n = 47; 85.5%) did not feel that men find breast-feeding women less attractive.

Facility and environmental factors

In general, lack of privacy seemed a common obstacle, with most mothers (n = 41; 74.5%) indicating that this was a barrier to breast-feeding for them.

Knowledge regarding breast-feeding

The majority of the mothers agreed with the statement that a mother who smokes (n = 39; 70.9%) or who occasionally drinks alcohol (n = 31; 56.4%) should not breast-feed her baby. Most mothers tended to disagree (n = 51; 92.7%) with the statement that medication taken by them prevented them from breast-feeding.

A few mothers (n = 21; 38.2%) felt that they did not want to breast-feed because they did not have previous experience or knowledge of breast-feeding and most mothers (n = 37; 67.3%) indicated that the fact that they could not express breast milk or use a breast pump did not influence their decision not to breast-feed.

Factors affecting the composition of breast milk seemed to influence the mothers' decision, with 12 mothers (21.8%) indicating that they were afraid that their breast milk would not have the optimum composition and more than a third of the mothers (n = 20; 36.4%) indicating that they believe infant formula is as healthy as breast milk for their baby. Most mothers (n = 46; 83.6%) indicated that the fact that they know what volume of milk their infant receives with infant formula influenced their decision to rather not breast-feed.

Other influences: Mass media

Thirty-nine of the mothers (70.9%) disagreed with the statement that milk formula advertisements influenced their decision to rather formula feed.

Family dynamics

Twenty-seven mothers (49.1%) indicated that the fact that their own mother could not breast-feed, or preferred not to, influenced their decision to formula feed.

Most mothers (n = 45; 81.8%) disagreed with the statement that their husbands preferred them to formula feed. However, more than half of the mothers (n = 37; 67.3%) felt that the fact that they can share the workload with their husband caused them to opt for formula feeding. Eleven (20.0%) of the women indicated that encouragement and support in breast-feeding from their husbands was lacking and almost two-thirds (n = 34; 61.8%) did not agree that fathers felt left out if mothers breast-feed.

Cultural factors

The mothers had different opinions about whether it is acceptable to breast-feed in public. Although most mothers (n = 53; 96.4%) felt that breast-feeding is a natural human activity, almost half of the mothers (n = 27; 49.1%) felt that it is unacceptable to breast-feed in public and 14 (25.5%) of the mothers felt that it is unacceptable to breast-feed in front of others.

Hospital and clinic

The majority of mothers did not agree with the statement indicating that a lack of, or inadequate, health care support influenced their decision not to breast-feed (n = 50; 90.9%).

Feeding practices

Breast-feeding

Twelve infants (21.8%) never received breast milk. The rest of the mothers discontinued breast-feeding at the following weeks: week

1 to 4 (n = 8; 14.5%), week 5 to 8 (n = 13; 23.6%), week 9 to 12 (n = 5; 9.1%), week 13 to 16 (n = 6; 10.9%), week 17 to 20 (n = 7; 12.7%) and week 21 to 24 (n = 4; 7.3%). Twenty-one (38.2%) of the mothers discontinued breast-feeding within the first two months at a median age of eight weeks and a mean age of 8.67 weeks (± 7.68).

A total of 24 (43.6%) mothers had an older child(ren). Seven (29.2%) of these infants received only breast milk with or without complementary food up to the age of six months. Fifteen of these 24 infants (62.5%) received a combination of breast milk and infant formula up to the age of six months. The overwhelming (54.6%) reason mothers gave for discontinuing breast-feeding of the previous born child(ren) was that she had to return to work.

Infant formula

Eighty per cent (n = 44) of the mothers decided only after the birth of their infant to rather formula feed while 13% made the decision before pregnancy and 7% during pregnancy.

A quarter of infants (n = 13; 23.6%) received infant formula from birth. The rest of the mothers introduced formula milk at the following weeks: week 1 to 4 (n = 11; 20%), week 5 to 8 (n = 13; 23.6%), week 9 to 12 (n = 6; 10.9%), week 13 to 16 (n = 7; 12.7%), week 17 to 20 (n = 3; 5.5%) and week 21 to 24 (n = 2; 3.6%). The age at which infant formula was introduced to the infants ranged from 0 to 23 weeks, with a median age of six weeks and a mean age of 7.27 weeks (± 6.9).

Forty-nine of the infants (89.1%) received an infant formula that was appropriate for their reported age and medical condition provided. One infant received a follow-on formula that was inappropriate for the reported age and five infants received specialised products, which were not indicated according to the medical history provided.

A total of 58.2% of mothers adhered to the same brand of formula that they had first introduced to the infant. Twenty-three of the mothers (41.8%) had tried other infant formulas. The most common reasons why the mothers reported discontinuing the infant formula included that the infant did not like the taste (n = 8; 34.8%), it caused constipation in the infant (n = 3; 13.0%) or it was too expensive (n = 3; 13.0%). Seven of the 55 mothers (12.7%) even discontinued using a second infant formula. The most common reported reasons included that the infants were hungry after feeds (n = 2; 28.6%) and that the infants did not like the taste (n = 2; 28.6%). Other reasons included that the infant did not grow (n = 1; 14.3%), the infant was soy intolerant (n = 1; 14.3%) and that the infant gained weight too quickly (n = 1; 14.3%).

Twenty-eight of the mothers (50.9%) reported giving a volume between 101 to 150 ml/kg/24 hours to their infants, while 14 mothers (25.5%) reported giving 50 to 100 ml/kg/24 hours and 13 mothers (23.6%) reported giving between 151 to 200 ml/kg/24 hours. The majority of infants received the correctly constituted infant formula (as calculated by the mothers' reported mixing procedure), but some received over-diluted infant formula (n = 7; 12.7%) or over-concentrated infant formula (n = 5; 9.1%).

Mothers' infant formula choice

Mothers reported that mostly paediatricians (n = 34; 61.8%), clinic nurses (n = 23; 41.8%), family (n = 18; 32.7%) and friends (n = 18; 32.7%) gave advice to them regarding which infant formula to use. Mothers also indicated that advertisements in books (n = 10; 18.2%), supermarkets (n = 9; 16.4%) and magazines/newspapers (n = 8; 14.5%) most often influenced their decision when choosing an infant formula for their infant. Other factors that reportedly most often influence a mother's decision when choosing an appropriate infant formula are described in Table II.

Table II: Properties of the infant formula that influenced the mothers' decision when choosing an infant formula

Properties of infant formula	n	%
Composition of infant formula	34	61.82
Always and easily available in shops	28	50.91
Name of the product	23	41.82
Infant prefers the taste	23	41.82
Range has follow-on formulae/complementary food available	23	41.82
Price	21	38.18
Due to infants medical condition	16	29.09
Label of tin	15	27.27
Size of tin	12	21.82
Colour scheme of label	6	10.91
Layout of label	6	10.91
Display in supermarket	6	10.91

Introduction of complementary food

At the time of the study, 36 of the mothers (65.5%) had already introduced complementary food to their infant's diet. Six (16.7%) of these mothers reported having introduced complementary food within the first two months and six (16.7%) did so in the third month. The median age of these 36 infants when complementary food was introduced was 16 weeks and the mean age of the infant when complementary food was introduced was 14.67 ± 5.65 weeks and ranged from 1 to 24 weeks of those infants receiving complementary food at the time of the study.

Discussion

This study found that most mothers (80%) made their decision to formula feed their infant only after the birth of their infant, which differs greatly from the 11% found in a study conducted in the USA.[1] This might indicate that the mothers generally did not have a negative attitude towards breast-feeding, which was supported by the attitudes obtained from the questionnaire, and were only challenged with breast-feeding difficulties after the birth of the infant. External factors present after the birth of the infant, especially having to return to work and being unsure of the volume of milk provided by breast-feeding, seem to have influenced the mothers' choice to rather formula feed their infant. The rest of the mothers made the decision to formula feed their infant either before (13%) or during pregnancy (7%), in contrast to the above-mentioned study, which found that the majority (63%) of mothers made their infant-feeding choice before pregnancy and 26% during pregnancy.[1]

It was encouraging to find that less than a quarter of the mothers in this study indicated that they did not enjoy breast-feeding. Again in contrast, a study conducted in Hong Kong on patients of both

private and public hospitals found that a larger percentage of women (40.5%) disagreed to the statement that breast-feeding is enjoyable. As found in this study, mothers in Hong Kong also agreed that the fact that there is no privacy for breast-feeding in public places is a barrier to breast-feeding.[11]

Sarah et al established that mothers with less knowledge regarding breast-feeding tended to formula feed their infants. These mothers in Hong Kong indicated that if they knew more about breast-feeding, they would breast-feed.[11] Data from this study found the same phenomenon. Chezem established that breast-feeding knowledge is strongly correlated with breast-feeding confidence and that it also correlates with the actual duration of breast-feeding.[19] Almost half of the mothers in our study indicated that their own mother could not breast-feed, or preferred not to, and that influenced their own infant-feeding decision. Various other perceptions also point to the fact that mothers lack breast-feeding knowledge, for example mothers indicating that they preferred infant formula due to the fact that they know what volume of milk their infant receives; the indication that they were afraid that their breast milk would not have an optimum composition; the agreement that infant formula is as healthy as breast milk for a baby and being afraid of sagging breasts. A lack of knowledge regarding breast-feeding was identified as having a great influence on the decision-making process of a mother and is therefore one of the key issues that should be addressed in South Africa to empower mothers with sufficient knowledge to make an optimal infant-feeding decision. Even after making a decision, she should receive ongoing motivation and support to practise her decision, for as long as this option is convenient to her.

The majority of mothers in this study have the opinion that a mother who smokes should not breast-feed her infant. A previous study conducted in China, however, concluded that current parental smoking habits only affected the initiation of breast-feeding and that it was not linked to the duration of breast-feeding.[20]

In this study population of mainly working mothers, more than three-quarters of the mothers agreed to the statement that their facilities at work do not support breast-feeding. There was a trend in this study for part-time employed mothers to have a shorter duration of breast-feeding, which might be due to these mothers not qualifying for maternity leave. In Hong Kong most mothers also felt that the facilities at work do not support breast-feeding practices.[11] Jeffs found that 10% of mothers gave the reason of "want to go back to work" as the motive for giving an infant formula.[21] Ryan found that working mothers were more likely to discontinue breast-feeding at an earlier period than non-working mothers.[22]

A previous study conducted in the USA found that the fathers of breast-fed babies were more likely to believe that breast milk is superior to infant formula, assists with mother-infant bonding and also protects the infant from disease.[23] The majority of mothers in the study felt that the fact that they can share the workload of formula feeding with their husband resulted in their opting for formula feeding. Although only 20% of fathers in the study preferred formula feeding, 38% of mothers felt that encouragement and support in breast-feeding was lacking from their husband. Bar-Yam concluded from existing literature that fathers influence four facets of breast-feeding in particular, namely the decision to breast-feed, assistance during the first feed, the length of breast-feeding and the risk factors for formula feeding.[24]

Half of the mothers in this study felt that breast-feeding ties them down socially, which is similar to findings from the study performed among mothers in Hong Kong.[11]

In contrast to a study conducted in the USA that found a lack of adequate health care support was one of the barriers to breast-feeding,[13] almost all the mothers in this study did not agree with the statement that they have inadequate health care support. This is corroborated by the fact that during the period 2000–2006 the antenatal care coverage was 92% in South Africa.[25] However, almost half of the mothers agreed to the statement that successful breast-feeding depends very much on their social support network.

The majority of infants received an appropriate infant formula. Specialised infant formulas were most often used inappropriately. Although most infants received the appropriately diluted infant formula, there was a substantial number of mothers over-diluting or over-concentrating the infant formula. Almost half of the mothers changed the infant's formula due to subjective reasons such as taste and hunger. Mothers also indicated that the formula caused constipation or weight gain, which might be due to incorrect mixing practices. This correlates with other data on lower socio-economic participants in the Cape Metropole where more than one-fifth of mothers incorrectly prepared the infant formula.[26] The over-concentration of infant formula might place the infant at risk of gaining weight too quickly and it places an extra load on the kidneys, while over-diluted milk might place the infant at risk of a low weight gain therefore leading to the infant being underweight.[27]

Only half of the infants received the correct volume of infant formula per day.§ Should an infant receive a too large or too little volume of milk, it might develop malnutrition as a result of an imbalance in acquisition of micro- and macronutrients.

§ This is if the required infant formula intake is approximately calculated according to the fluid needs of an infant 10 days old: between 125–150 ml/kg/day; 3 months old: between 140–160 ml/kg/day; and 6 months old: between 130–155 ml/kg/day.[27]

It was discouraging that friends and family as well as media advertisements are regular sources of infant-feeding information. Aberman also found that one-fifth of mothers reported that books influenced their choice of an infant-feeding method.[28] In the USA it has been stated that hospital staff and their practices have a role in the promotion or inhibition of breast-feeding that is not well recognised.[29]

It was interesting to find that mothers regarded the composition of the infant formula as the property they most often base their formula milk decision on, but it can be queried whether the mothers have the knowledge base to interpret the composition correctly. Mothers deemed the taste of the formula to their infant as important, but again this is a subjective observation by the mother. The following factors on which to base a decision regarding formula milk would not be recommended: the fact that the product is always and easily available in the shops, the name of the product, the fact that the range has follow-on formulae and complementary food available as well as the price of the product. Marketing factors such as the colour scheme of the label, layout of the label and display in supermarkets had less of an impact on the mothers' decision.

It is of concern to find that more than one-fifth of the infants in this study were never breast-fed, while breast-feeding was discontinued

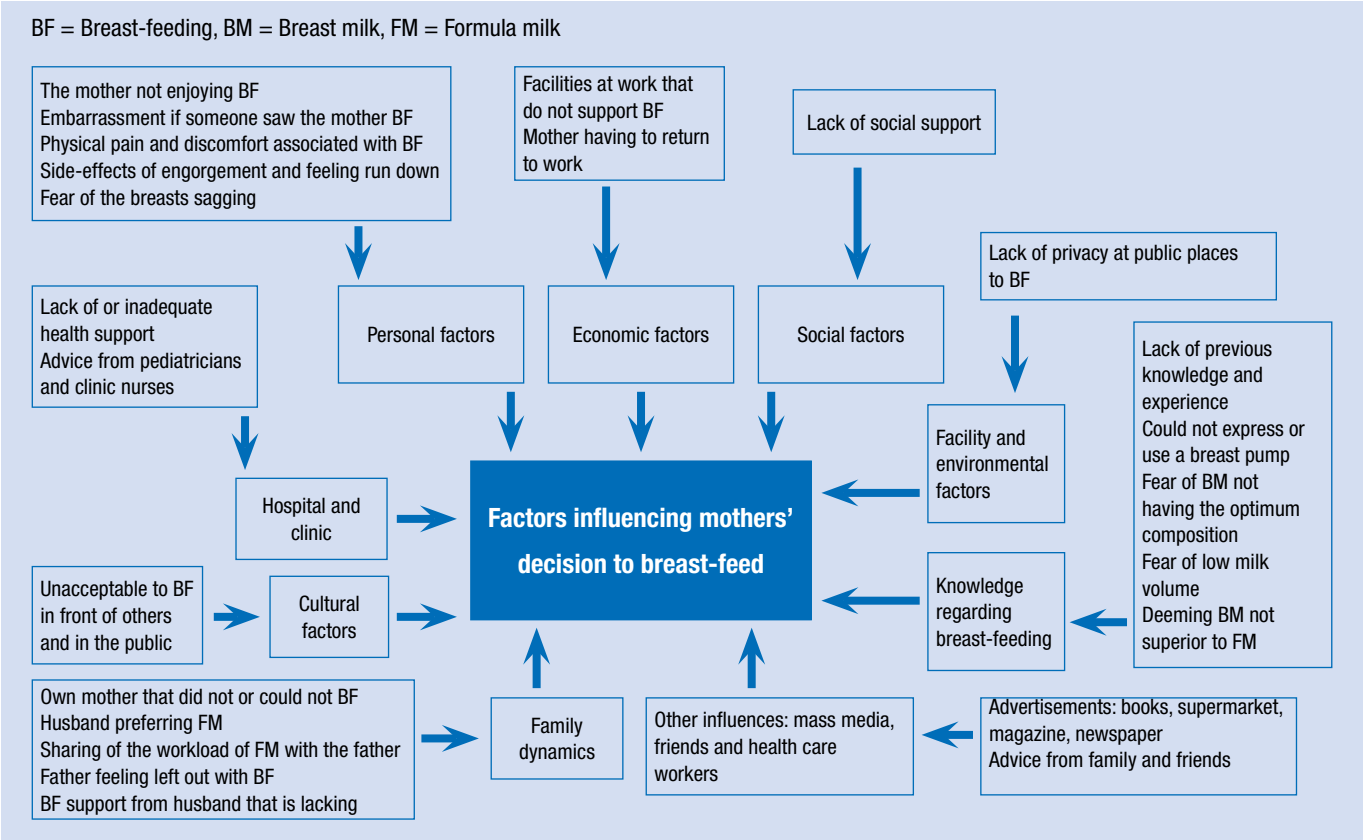
for almost half of the infants during week 1 to 12 and for one-third of the infants during week 13 to 24. Therefore a quarter of the infants in this study were never exposed to the substantial benefits of breast milk. A previous study conducted in South Africa found that 97% of mothers initiated breast-feeding at birth, but only 12% of mothers were still feeding their infant breast milk at 16 weeks of age (with or without water and complementary food). In the mentioned study on a lower socio-economic group, almost 70% of mothers introduced infant formula to their infants before the age of two months. The main reason given for the introduction of infant formula was that the mother perceived her milk supply to be inadequate.[26] The current recommendation is that infants should be exclusively breast-fed for the first 24 weeks of life and thereafter complementary food should be introduced while breast-feeding is sustained up to at least 24 months of age.[9] Kurinij found that infants in the USA who were exclusively breast-fed in the early days after birth were more likely to still be breast-fed at six and twelve months of age.[30] A study conducted in Ghana found that 71% of neonates received breast milk within the first day of birth, and only 1.3% had not received breast milk by the end of day 3. Fortunately 77% of the mothers practised exclusive breast-feeding during their infant's neonatal period. The researchers concluded that 16% of neonatal deaths could be prevented if breast-feeding was initiated on day 1 and 22% of neonatal deaths could be prevented if breast-feeding was initiated within one hour of birth.[31] In South Africa initiatives such as the Baby Friendly Hospital Initiative are being implemented as a strategy to encourage early initiation of breast-feeding to newborns. In the Cape Metropole area there is currently only one private facility that is certified as Baby Friendly.[32] In general it has been observed that more infants are being breast-fed over the past decade, but this is due to infants being breast-fed while also receiving infant formula, and therefore not exclusive breast-feeding.[33]

At the time of the study, one-third of the mothers had not yet introduced complementary food to their infants aged between 0 and 6 months, while one-third of those that had already introduced complementary food to their infants did so between the age of 1 to 12 weeks. A previous study, also conducted in the Cape Metropole among lower socio-economic participants, found that some mothers started to wean their infants at one month and that the weaning process continued until nearly all infants had had complementary foods introduced by the age of four months.[26] The current recommendation regarding the introduction of complementary food is that it should only be introduced at the age of six months. This is due to the concern for the development of food sensitivities.[34] Other reasons might include a possible risk for excessive weight gain, increased risk for infections, vulnerability of the gut to infection, eczema, increase in allergic diseases, respiratory diseases, asthma and a reduced volume of breast milk that can be consumed by the infant.[35-37]

Conclusion and recommendations

In this study it was found that the introduction of infant formula occurred very early (six weeks) and that breast-feeding was discontinued early (eight weeks), with the majority of mothers making this decision after the birth of their child and having a seemingly

Figure 3: Framework of factors that affected the mothers' choice to rather formula feed her infant in this study



positive attitude to breast-feeding. Evident factors that are barriers to breast-feeding include a lack of knowledge and experience, lack of breast-feeding support after birth, having to return to work as well as a lack of facilities at public places and at work to breast-feed. All factors found to influence the mothers' decision in this study are illustrated in Figure 3.

In line with the early discontinuation of breast-feeding, a trend of early introduction of complementary food also emerged. Furthermore, inappropriate formula and incorrect reconstitution, although not a problem for the majority, are factors that must be taken into consideration as they may have adverse health implications for the infants.

It is recommended that all mothers in South Africa be empowered to be able to make the optimal infant-feeding decision, which will be in the best interests of herself, her infant and her family. The researchers conclude that one has to ensure that all information sources give scientifically sound, consistent advice that will be of optimal benefit to the infant-mother pair and that the role of a registered dietician in supporting infant-feeding counselling should not be overlooked.

In order to protect, promote and support breast-feeding in mothers, the following aspects need to be addressed:

- Educate both parents prenatally regarding the health benefits of breast-feeding.
- Provide scientifically correct knowledge, help and support to breast-feeding mothers from birth onwards.
- Teach each breast-feeding mother the appropriate skills needed to maintain lactation and prevent breast-feeding problems.
- Counsel both parents regarding appropriate weaning practices.
- Establish workplace baby care facilities to enable working mothers to continue breast-feeding.

The investigator's opinion is that one of the greatest challenges to support, protect and promote breast-feeding is to ensure that all information sources give scientifically correct information to the uninformed or information-seeking mother, firstly in a standardised and secondly in a positive manner. This can only be achieved if all health care workers receive appropriate training, the media consult suitable individuals for example a dietician for scientifically correct information and the International Code of Marketing on Breast Milk Substitutes is followed correctly.

Limitations

Limitations of this study included the poor return of the questionnaires and therefore the small sample size, as well as hospital practices influencing the choice of mothers to formula feed or breast-feeding that were not investigated. It should be remembered that this study was conducted on mothers of a high socio-economic level and cannot be extrapolated to all women in the Cape Metropole.

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