

Factors that make mothers opt for breast milk substitutes in Zambia.

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Abstract

Background: The world health organization (WHO) recommends exclusive breastfeeding for at least 6 months and continued breastfeeding up to 2 years or beyond. There is very little evidence on the factors associated with early introduction of Breast Milk Substitutes (BMS) to infants in Zambia. We sought to explore the factors that determine the early introduction of BMS to infants in two suburbs, Kalingalinga and Chelstone, in Zambia. **Methods:** This was qualitative phenomenological study. Focus Group Discussions (FGDs) were the data collection instruments used. Up to 71 mothers of infants below six months of age participated. During the FGDs, the mothers were encouraged to reflect on their infant feeding practices. Mothers who participated signed the consent form before the start of the FGDs. The FGDs were conducted in a room at each health facility. This is in order to ensure confidentiality. Mothers were also free to withdraw at any time. The discussions were audio-recorded, transcribed verbatim and organized using NVIVO software version 10 (Melbourne, Australia). This was followed by thematic analysis. **Results:** Maternal and external factors determined early introduction of BMS to infants. Maternal factors included perceived low milk production, employment/school, personal modesty, HIV/AIDS, perceived benefits of BMS, mode of delivery, traditional beliefs and standard of living. External factors cited included influence from manufacturers and distributors of BMS, friends and relatives, as well as health care professionals. **Conclusion:** Addressing maternal and external factors through educating mothers, peer to peer counselling as well as training of health care workers, families, friends and implementation of the Code could be helpful to improve infant feeding practices among mothers in Kalingalinga and Chelstone.

Keywords: Breast milk substitutes, Breastfeeding, Infant feeding, HIV and infant feeding.

Introduction

Introduction of Breast Milk Substitutes (BMS) earlier than six months of a child's life is prevalent in the world [1-4]. A BMS is a solid or liquid food that replaces breast-milk in full or in part. Breast Milk Substitutes include; infant formula, follow-on formula, baby cereal as well as home-made foods [5]. Early introduction of BMS in children below six months of age reduce the rate of Exclusive Breastfeeding. According to WHO, Exclusive Breast Feeding (EBF) should be practiced for the first six months of a child's life and BMS is only recommended to be given to Infants and Young Children for the medical reasons that are acceptable [6,7]. World-wide, the rate of exclusive breastfeeding for infants under six months

of age, continued breastfeeding at one year and two years are at 40%, 74% and 45% respectively [8]. In Zambia, exclusive breastfeeding is at 73% [9]. This appears quite high despite the HIV prevalence compared to the Global Nutrition Target of over 50% by 2025 and 70% by 2030. It should however be noted that the median months of exclusive breastfeeding are 4.1 [9] showing that the rate of exclusive breastfeeding is still low in Zambia. Exclusive Breastfeeding is also recommended for infants exposed to HIV/AIDS through their mothers. It is known to reduce rates of mother to child transmission of HIV (MTCT) [10]. A study based on the Health Management Information System (HMIS) in Choma reported Transmission (MTCT) of HIV rates an average of 4%. This was for the

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period 2011 to 2014 [11]. While findings of a recent study focusing on the three provinces of Zambia showed MTCT rate of 3.8%. The reduction in MTCT may be due to delayed introduction of BMS. A number of factors are associated with early introduction of BMS to infants and young children.

Reported maternal factors associated with early introduction of BMS are younger age (particularly teenage mothers); shorter education; employment; cesareans; neonatal complications, cultural beliefs and taboos, and living in low-income households [12,13]. Others are insufficient milk production, poverty, high work burden and lack of decision making power in the household [14]. In addition, severe disease in the mother such as HIV, mothers faced challenges in complying with optimal breastfeeding practices owing to lack of community support systems and breast infections due to poor breastfeeding occasioned by infants' oral health challenges. Moreover, some mothers were hesitant of lifelong ARVs. Health workers faced programmatic and operational challenges such as compromised counseling services [11]. In addition, belief that the child will gain weight and grow fast has also been reported [15]. The influential external factors include parents, friends and medical professionals [16,17]. In our earlier work manufacturers' inappropriate labelling and distributors' point of sale promotional activities enticing mothers were significant [18].

Children are introduced to BMS mostly between three-six months [19]. Commercial baby foods are frequently offered to children below six months. These include follow-on formulas as well as baby cereals [2,4]. Potatoes, vegetables, tea and fruits as well as porridge, soups and other homemade foods are also offered [2,20]. In addition, juice and water are equally offered [21].

Introducing BMS early to infants could lead to the reduction in the prevalence of exclusive breastfeeding (EBF) necessary during the first six months as well as continued breastfeeding up to two years and beyond [22-24]. It could also result into early-childhood stunting, overweight and obesity, the prominent core underlying factors of Non-Communicable Diseases (NCDs) [21,25]. Consequently, WHO introduced the International Code of Marketing Breast-milk Substitutes in 1981, designed to minimize unnecessary and inappropriate use of BMS thereby promoting breastfeeding. The Code has been enacted as Statutory Instrument (SI) number 48 of 2006 of the Laws of Zambia [5,26].

There is very little evidence about the factors associated with early introduction of BMS in Zambia. Therefore, we set out to investigate the factors that determine the early introduction BMS in Infants in Kalingalinga and Chelstone suburbs in Lusaka, Zambia.

Methodology

Study design

The nature of the study required the generation of open and unrestricted responses from the participants supplemented with careful and selected clarification, probing and facilitation leading to in-depth analysis. Therefore, a

qualitative phenomenological study with FGDs data was collected instrumentally. Phenomenological study focusses on lived experiences of the study participants [27,28]. FGD in this context was more preferable. During the FGD, full participation was encouraged to reveal collectively shaped social processes and any hidden pertinent issues [29-31].

Setting and population

This study was conducted in Lusaka, the capital city of Zambia. Lusaka was convenient as an urban district where more people are likely to use BMS than in rural communities. Two study areas within the city of Lusaka were included in the study. Kalingalinga, a medium density suburb and Chelstone, a low-density area were the study sites. Closely reflecting the urban living standards of average Zambians, the two suburbs were purposively selected. Targeted study participants were mothers of infants aged below six months.

Sample size consideration and sampling

A purposive sample of 71 mothers of children below six months, participated in FGDs in Kalingalinga and Chelstone. These mothers belonged to the two catchment areas and were willing to share their views. Written informed consent was obtained from the mothers before every FGD commenced. FGDs were conducted in a private place to ensure confidentiality. Mothers were free to opt out at any point during the FGD without any problem. Four FGDs were conducted in each site. Up to 32 mothers participated in Kalingalinga. Meanwhile in Chelstone 39 mothers participated. The number of mothers per FGD ranged from eight to 10. The data collection ended when theoretical saturation was achieved and no new information was forthcoming. This occurred after FGD-4 in each site. In each suburb, health facility and community based FGDs were conducted in Nyanja. This is the predominantly spoken language in Lusaka, with occasional clarifications in Bemba and English.

Conduct of a focus group

Facilitators started the FGD by thanking the mothers, followed by a brief explanation of the purpose of the study. An FGD guide was used to collect data. Two facilitators moderated the discussion within each group and ensured that all the topics in the interview guide were covered. The participants were encouraged to reflect on their breastfeeding practices. The discussion was digitally recorded, and the facilitators also took written notes. Each focus group discussion lasted an average of an hour. In Chelstone, FGDs were held at the Maternal Child Health (MCH) department as well as in a room at the community based Tuberculosis Organization. The two venues were conducive as they provided some privacy. In Kalingalinga, the FGDs were conducted in an office for the nutritionist at the health facility as well as at an open place run by the Young Men Christian Association (YMCA). This was also used for monthly routine community based growth monitoring and promotion (GMP) activities. FGDs were conducted until theoretical saturation was reached. The level of participation was managed by constantly reminding the mothers that the information they were providing was of utmost importance to the nation. They were urged to

actively participate. Education to the mothers where there was ignorance was ensured.

Data analysis

The audiotapes were transcribed verbatim and combined with the notes. They were later independently translated prior to data analysis. All personal and identifiable information was removed to maintain confidentiality. Then, researchers familiarized themselves with the data to acquire deeper insight. This was realized by reading and re-reading transcripts. The data were then organized into themes using NVIVO software version 10 (Melbourne, Australia). The themes were analyzed to come up with major and sub-themes. Following the organization of data, coding was also carried out using NVIVO software version 10 (Melbourne, Australia). During coding, codes were matched with segments of text/informant statements, selected as representative of the code [32]. The original meaning of what was communicated by the informants was maintained. Searching for themes among codes was the next level. Firstly, categorization was conducted. This involved grouping the Code segments into sub-themes based on similarity of content. This was done in order to reduce the number of different pieces of data in the analysis. Therefore, similar codes were grouped together to form categories. Major themes were developed by interpreting the categories for

their underlying meaning. Themes were the higher level of categorization that was used to identify a major element of the entire analysis of the data. A theme therefore is an outcome of the coding, categorization and analytic reflection [33].

Findings

Respondents

Up to 71 mothers of children below, six months participated in FGDs. The mean age of these mothers was 28 of which most of them (31.0%) had only completed junior secondary education. Almost half (49.3%) of the mothers were in casual or part time employment. Mothers who attained tertiary education and were in permanent employment were more in Chelstone (54.9% and 38.5% than in Kalingalinga (45.1% and 15.6%) respectively. Most children (33.8%) that came with their mothers were two months old. Table 1 and Table 2 show the details.

Characterization of Factors that Make Mothers Opt for BMS

Mothers confirmed having opted for BMS usually mixed with breastfeeding for children in the first six months of life. We found two major categories of factors that influence mothers to opt for BMS. These were (1) Maternal Factors and (2) External Factors, further divided into 10 sub-themes (Table 3).

Table 1. Details of mothers with children below six months in Focus Group Discussions (FGDs) conducted in two communities in Lusaka Zambia, October-November 2015.

FGD no.	Participants (n)	Average Age	Township
1	9	23.0	Chelstone
2	10	27.5	Chelstone
3	10	28.0	Chelstone
4	10	27.0	Chelstone
5	8	28.0	Kalingalinga
6	8	28.0	Kalingalinga
7	8	28.0	Kalingalinga

Table 2. Socio-demographic characteristics of participants in Focus Group Discussions (FGDs) conducted in two communities in Lusaka Zambia, October-November 2015.

	Overall	Kalingalinga	Chelstone
Site n (%)	71 (100.0)	32 (45.1)	39 (54.9)
Age Mean (SD)	28.0 (16 41)	28.1(17 40)	27.9(16 41)
Level of education			
Primary n (%)	10 (14.1)	5(15.6)	5(12.8)
Junior Secondary n (%)	22 (31.0)	15(46.9)	7(18.0)
Senior Secondary n (%)	19 (26.8)	7(21.9)	12(30.8)
Tertiary n (%)	20 (28.2)	5(15.6)	15(38.5)
Employment			
Permanent n (%)	25(35.2)	11(34.4)	14(35.9)
Part time n (%)	35(49.3)	17(53.1)	18(46.2)
House wife n (%)	11(15.5)	4(12.5)	7(18.0)
Age of the Children that the mothers came with			
Six weeks n (%)	13(18.3)	6(18.8)	7(18.0)
Two months n (%)	24(33.8)	9(28.1)	15(38.5)
Three months n (%)	13(18.3)	7(21.9)	6(15.4)
Four months n (%)	15(21.1)	6(18.8)	9(23.1)
Five months n (%)	4(5.6)	2(6.3)	2(5.1)
Six months n (%)	2(2.8)	2(6.3)	0(0.0)

SD: Standard deviation, n: number

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Table 3. Summary of factors that make mothers opt for breast-milk substitutes.

Major Factors	Sub-Factors	
	Kalingalinga	Chelstone
Maternal Factors	Knowledge About the benefits of breastfeeding About the risks of giving BMS early to children About the Code and/or SI no. 48 of 2006 of the laws of Zambia.	Knowledge About the benefits of breastfeeding About the risks of giving BMS to children About the Code and/or SI no. 48 of 2006 of the laws of Zambia
	Perceived low milk production	Perceived low milk production
	Employment	Employment/school
	HIV/AIDS Perceived benefits	Caesarean section Traditional beliefs HIV/AIDS Perceived benefits
External Factors	Friends and relatives	Friends and relatives
	Manufacturers Advertisements Labels Free gifts and samples	Manufacturers Advertisements Labels Free gifts and samples
	Distribution points Posters Low price sales Painting shops	Health workers Distribution points Low price sales Shop keeper advice

Maternal factors

Knowledge: Mothers demonstrated a lot of knowledge about the benefits of breastfeeding as well as the risks of giving children BMS early in life. One major benefit of breastfeeding reported by most mothers in Kalingalinga and Chelstone was a child who grew well. They understood breast milk to have a lot of nutrients and immune boosters. Diseases such as diarrhea, vomiting, malnutrition and HIV/AIDS were cited as major effects of early introduction of BMS. Mothers in Chelstone also cited constipation, indigestion as well as mal-adaptation among children. Other risk factors identified in both sites were frequent use of expired BMS following promotions in retail outlets, presence of artificial ingredients as well as the high cost of buying BMS. All the mothers were ignorant of the Code and/or SI 48 of 2006 of the Laws of Zambia. These two documents protect breastfeeding. “We don’t know that by Law we are not supposed to be contacted by manufacturers of BMS,” said a mother of six weeks old baby, in Chelstone.

Perceived low milk production: Mothers said that they did not have enough breast-milk in the first week following delivery. Most of them confessed having bought formula or giving glucose in this period for fear of the child becoming hungry consequently stopping when milk supply from the breasts improved. This ranged from one day up to one week. “When I just delivered no milk was coming out in the first 3 days, because of this I bought formula and gave the child for one day”, reported a mother of a three months old child, Kalingalinga. “As the child grows milk may not be enough”, was a universal concern among mothers. They narrated that they experienced not having enough milk from the breasts to satisfy the child at about two to six months. At this time the child is perceived to be crying of hunger especially children who cry a lot. Unanimously they reported that “Breast milk is not enough at about two to three months”. A mother of six

months old child in Chelstone said; “My baby started eating porridge at 5 months. The child was crying as the milk was not enough, so we gave porridge”

Perceived benefits: Young mothers were reported to opt for BMS instead of breastfeeding in order to prevent the breasts from sagging and avoid losing weight. Mothers further shared how their friends advised them to give BMS early so that the child could gain weight. They further mentioned some retail outlets where they could get original brands of BMS for that purpose. Other mothers reported getting advice to give porridge to a newly born baby to open up intestines. “A child is born with small intestines, I was advised to give porridge to open up the intestines by friends”, said a mother of six weeks old baby, in Chelstone.

Cesarean section: Some mothers in Chelstone cited a caesarian section for opting for BMS. They said that during that time they have no energy to breastfeed, and are in pain following a caesarian section. They added that they did not have milk because of not being able to eat for some days. They were drinking water later graduating to light porridge as they healed. Some of them further reported that when they tried to breastfeed soon after a caesarian section, milk did not come out. Mothers reported giving formula to the babies with reports from birth up to one month. “...I had a painful operation. Therefore, I had to use formula for one month, during which it was painful to breastfeed. When I healed, I stopped giving formula month...”, said a mother of two months old baby, in Chelstone.

HIV/AIDS: When asked about any situation in which a mother could give BMS, most mothers in both sites indicated that in case of a critical illness or disease of the mother. They could give BMS. The illness can be discovered at the clinic and can be transmitted to a child particularly HIV/AIDS. A mother of four months old baby in Chelstone said “HIV/AIDS

mothers are told to exclusively breastfeed for 6 months then stop. They can also breastfeed up to 1 year 6 months with septrin”.

Traditional beliefs, myths and misconceptions: In Chelstone, there were reports of “Ichibele” among mothers who avoided breastfeeding in public. In public places such as in buses as well as at the children’s clinic, they preferred bottle-feeding. “Icibele” is a Bemba word implying that some mothers may not breastfeed in public fearing that their children who have not experienced the traditional ritual would end up getting sick if breastfed at the same time and place with those who have undergone the ritual. In the same site, there was a belief that; “expressed breast-milk hardens upon boiling and if fed, a child would defecate blood” as well as that “the breasts got swollen when the child belched (vomited) on the breast”. In these cases, a mother would resort to giving formula.

Others: Mothers in Chelstone with a lot of money go for BMS as opposed for breastfeeding. In the same site mothers reported that some children refuse breastfeeding in preference for the bottle. It is here where a mother said, “There is not enough information from the health sector on how to keep expressed breast milk”. Other situations mentioned by mothers in both sites were breast cancer as well as when a mother dies.

External influences

Employment/School: Mothers cited employment as a reason for opting for BMS. They added that expressed breast milk is never enough. Mothers mostly reported giving formula at about two months of the age of the child because of having short maternity leave. They stated that there is lack of laws to protect mothers from unpaid maternity leave. If a mother has not clocked two years, at work, she is not supposed to get pregnant or else she will have no choice but to leave the child on the bottle. Mothers, who go to school in Chelstone, were reported to equally opt for BMS. The child was given formula while they were away at school. A mother of a three months old baby in Chelstone said “...I work and leave the child on the bottle what can I do”.

Friends, relatives and health care workers: Friends and relatives had great influence on IYCF. They were reported to offer advice on appropriate BMS. They also advised on the best retail outlets for BMS as well as benefits of BMS. Mothers recalled sitting with fellow women to discuss feeding of children, learning from each other’s experiences. Using social media such as WhatsApp and face book mothers post problems through “azimayi” (mature women) forum while others reply. Most mothers reported spread of information on BMS during social gatherings. These include working places, churches, and neighborhoods. Others are weddings, kitchen parties, public taps and bus stations. Having successfully used a BMS brand made some mothers an effective source of influence. “I used two named formula brands, I learned from friends and other women”, said a Mother of a two months old baby in Chelstone. Meanwhile, “ulunkumbwa”, a Bemba word implying “admiring” was also frequently cited. Some mothers said that health care workers influenced them to give BMS to their child below six months. “I was advised to use

a named formula brand by a doctor”, reported one mother. “A nurse also bottle fed,” reported another mother. The latter was encouraged to use BMS after having been a house cleaner for a nurse. Reports of advice by health care workers to give BMS, after exclusively breastfeeding for six months to avoid mother to child transmission among HIV positive mothers were frequent.

Manufacturers and distribution points: Advertisement of BMS was reported. A mother in Kalingalinga said “there are advertisements of a named milk cereal brand on Television with a fat crawling baby, the age of the child is not clear”. “Manufacturers also come in the ground with a big vehicle with dancing advertising a milk cereal”. Most mothers in Kalingalinga and Chelstone added that there were advertisements in the community using a big vehicle, dancing, giving T-shirts, glycerin and sachets”. Ordinary milk of a known brand is what they advertised; mothers confessed giving the unsuitable milk to infants.

Flashy, enticing colors, unclear breastfeeding messages as well as unclear expiry dates along with pictures of smooth prepared porridge were reported. Mothers added that there was great emphasis on BMS being high in nutrients on the labels. In Chelstone, mothers reported labels indicating new look so that mothers could deem it better.

Posters of a named beverage for public consumption in Kalingalinga shops understood to be Infant feeding brand posters. Likewise, posters of a named milk cereal brand were also taken to be carrying infant feeding information. Some mothers reported tie-in-sales i.e. “buy two and get one free” beside price reductions in shops within the neighbourhoods and supermarkets. Painting of shops with a named milk cereal brand was equally reported. Furthermore, a mother of six months old baby in Chelstone said “...I was advised to buy a named formula brand by the shop keeper”, citing shopkeeper advice.

Discussion

Main findings of this study: This study explored the mothers’ perceived factors that make them opt for BMS in two suburbs in Lusaka, Zambia. The study has shown that mothers were quite knowledgeable about breastfeeding and the risks of giving BMS to infants in consonant with studies elsewhere [34] which present an important basis to foster change. However, the mothers lacked knowledge about the International WHO Code on marketing of BMS and/or the local SI that protects breastfeeding. Two broad categories; maternal and external factors were used to group mothers’ perceived factors for opting for BMS (Figure 1).

Maternal factors reported include perceived low milk production along with perceived benefits. In addition, mothers reported caesarian section, illness citing HIV/AIDS and breast cancer as well as employment and school. Furthermore, traditional beliefs, mothers with a lot of money, children who refuse breastfeeding, as well as lack of information about the storage of expressed breast milk were reported. Death of a mother was another factor reported. Maternal factors could predispose the mothers to external pressures targeting infant feeding.

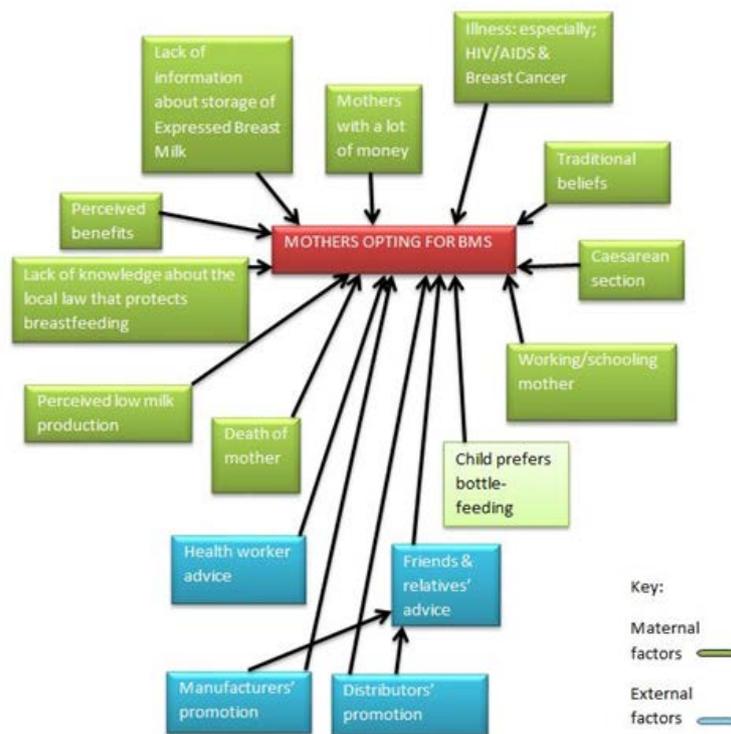


Figure 1. Factors that make mothers opt for BMS: Conceptual frame work.

External influential factors reported are work, friends, relatives, and health care workers implying doctors. Others are manufacturers and distribution points. Friends, relatives and health care workers advised on specific BMS brands besides retail outlets. In both cities there reports of advertisements, in inappropriate labelling and giving free gifts. A milk cereal brand was being advertised. Mothers perceived the advertisement to be targeting all children. They also confessed giving the advertised brand to children below six months. Point-of-sale advertising such as displaying posters, low price sales, painting shops with BMS brands along with shopkeeper advice were reported in distribution points. Succumbing to these pressures, compromises with the recommended IYCF practices. This may lead to increased prevalence of malnutrition in the form of underweight, stunted and wasted infants and young children (Figure 2).

What is already known: A number of maternal factors have been documented in consonant with this study. Across the world, mothers cited insufficient milk production for feeding options other than exclusive breastfeeding below six months [14,15,35-38]. In Asia and Africa, delivery by caesarian section was related to using formula in hospital and compromised exclusive breastfeeding particularly in urban and semi urban settings [13,39,40]. Some mothers who believed that BMS has better nutrition as well as others who had higher incomes opted for BMS [40-42]. In addition, a health problem, public breast-feeding embarrassment and breastfeeding perceived as detrimental to social life and relationships have been reported [43]. Noticeably, discrete studies have acknowledged lack of past breastfeeding experience, lower maternal education as well as infant's low birth weight as other maternal factors. Others are infant's first

feed in addition to lack of proper knowledge about the value of breast milk [35,40,44,45]. In Australia, mothers who are single, below 25 years, smoked during pregnancy and living in lower social economic areas were associated with low prevalence of exclusive breastfeeding [46]. Other factors are poverty, high work burden, lack of decision making power for women in house-holds [14]. The latter will be discussed in our next work in the series. It has been reported that exclusive breastfeeding decreased with increasing infant age up to six months [40]. The age range at introduction of other foods is between 3-6 months [19]. The most commonly introduced food is infant cereal [47]. Early introduction of BMS increases morbidity as well as mortality. This is because the baby's stomach is too small. BMS occupies space, which would have been occupied by nutritious breast milk. This could result into increased prevalence of underweight, stunting and wasting in Infants and Young Children [25]. WHO revised ten steps to successful breastfeeding need to be re-emphasized [48].

External factors include influence from friends and relatives, health worker influence, lack of work place flexibility, schooling as well as social media [15, 35, 37, 38, 42, 44, 49-51]. Among the friends and relatives, grandmothers were singled out to have influenced the infant feeding option [43,50]. Factors recounted in our earlier work in agreement with the current study as well as other studies elsewhere include, manufacturers' promotional activities of BMS such as labelling with pictures and/or text that idealize infant feeding, point of sale promotional activities such as contacting mothers at the point of sale, tie-in-sales and special displays [18, 52-54]. Equally in consonant with our current study, elsewhere manufacturers' mass media advertisements particularly that appear to be complying with the age limit stated in the Code of



Figure 2. Promotions in distribution points.

marketing BMS but with content that confused the audience, distribution of free samples and gifts, women having seen promotional materials have been documented [52-55].

What this study adds: This study has generated extra information such as introduction of BMS to open up intestines thereby initiating bowel movements, challenges in the storage of expressed breast milk, children refusing breastfeeding in preference for bottle-feeding as well as mothers' lack of knowledge about the International Code and local Statutory Instrument that protects breastfeeding. Introducing BMS to initiate bowel movements may be more harmful than beneficial. The intestines of the child may end up being bruised and become susceptible to infections [56]. In addition, mothers cited external influences such as distributors talking to mothers about BMS and Milk cereal beverage posters also regarded as adverts for BMS [57].

Conclusion

In conclusion, maternal and external factors make mothers opt for BMS. Elsewhere these have been expanded into demographic, biological, behavioural, psychosocial, and social factors. These findings are relevant for designing intervention programs aimed at educating parents. Ultimately, addressing maternal and external factors through educating mothers, peer to peer counselling as well as training of health care workers, families, friends and implementation of the Code could reduce on the frequency of use BMS, improve on breastfeeding rates and improved growth and development among children.

Limitations

This study has generated in depth information on IYCF. However due to the nature of the study, generalization of the results may not be applicable. Nonetheless, the information may be used for policy and program making in townships that were investigated, other townships with similar environments and situations in Zambia as well as sub-Saharan Africa.

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Declaration

Conflict of interest

NA

Ethical approval

The Excellence of Research Ethics and Science (ERES) converge Institutional Research Board (IRB) approved the study (ref. No. 2015-June-028). Permission was also obtained from the Lusaka District Health Office to conduct the pretest and research in the study sites. Written informed consent was obtained from all participants. The mothers were free to withdraw from the study at any time. The data collected was stored in computer with a password. Only the research team had access to the data

Study registration

N/A

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