

PARENTAL ATTITUDES TOWARDS CHILDREN (0 TO 6 YEARS OLD) FEEDING
PRACTICES AND PREFERENCES ON BABY FOOD PRODUCTS

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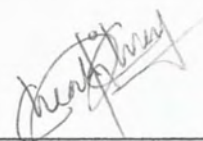
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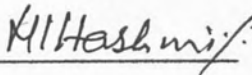
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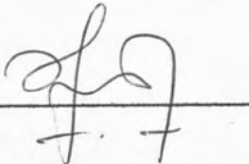
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ABSTRACT**PARENTAL ATTITUDES TOWARDS CHILDREN (0-6 YEARS OLD)
FEEDING PRACTICES AND PREFERENCES ON
BABY FOOD PRODUCTS**

A survey was carried out in the district of Kota Bharu, Kelantan to study the recent trends of infant feeding practices among parents, to determine the factors that influence infant feeding practices among parents and to evaluate attributes that influence parental purchase decision on baby food where 493 parents were interviewed and their socio-demographic information were recorded. Data on infant feeding practices were collected from mothers who had children from birth to 6 years of age. A total of 55.2% (n=272) mothers breast-fed their infant and 21.9% mixed-fed, followed by 11.8% formulafed for the first 6 months. Among the parents, only 2.8% of parent exclusively breast-fed their child for duration of 1-3 weeks. It is noted that there is a significantly association between maternal age ($\chi^2= 57.787$, $df=9$, $p<0.05$), educational level ($\chi^2=54.079$, $df=12$, $p<0.05$), occupation ($\chi^2= 132.590$, $df=24$, $p<0.05$) and household income ($\chi^2= 45.854$, $df=12$, $p<0.05$) and number of child ($\chi^2= 80.343$, $df=9$, $p<0.05$) with choice of infant feeding practice for the first 6 months . A majority of parents introduced complementary food at the age of 4 months and 5 months and the first food given was rice porridge (52.7%). The remaining parents 52.7% introduced commercial baby food to their child. Nurse (49.3%) and family members (32.7%) were the most important source of information regarding infant feeding practices. The main criteria that parents take into consideration while purchasing milk formula are price (78.7%), packaging (55.8%) and nutritional value (49.5%). Principal component analysis shows that convenience (25.5%), health consciousness (20.0%) and price (16.3%) are important in the purchasing criteria. The findings of the study concluded that although breast-feeding is widely practiced, however the practice of exclusive breastfeeding is not well practice and early introduction of solids is widespread.



ABSTRAK**TINGKAHLAKU IBU-BAPA TERHADAP PENYUSUAN DAN
PEMBERIAN MAKANAN KEPADA ANAK (UMUR ANTARA
0-6 TAHUN) DAN FAKTOR KESUKAAN TERHADAP
MAKANAN BAYI**

Kajian ini telah dijalankan di daerah Kota Bharu, Kelantan untuk mengkaji tren terkini tentang cara penyusuan dan pemberian makanan kepada anak di kalangan ibu-bapa; untuk mengkaji faktor-faktor yang mempengaruhi cara penyusuan dan pemberian makanan kepada anak; dan menilai faktor-faktor atribut yang mempengaruhi cara pembelian makanan bayi oleh ibu-bapa dimana seramai 493 ibu-bapa ditemuduga untuk mendapat informasi tentang maklumat sociodemografi. Data tentang cara penyusuan dan pemberian makanan kepada anak dikumpul daripada ibu-bapa yang mempunyai anak yang berumur 0 hingga 6 tahun. Seramai 55.2% (n=272) ibu yang memberi susu ibu kepada anak mereka, 21.9% memberi campuran susu ibu dan susu tepung dan 11.8% memberi susu tepung kepada anak mereka untuk 6 bulan yang pertama. Di antara ibu-bapa, hanya 2.8% daripadanya memberi susu ibu secara eksklusif kepada anak selama 1-3 minggu. Dapat diperhatikan bahawa terdapat perkaitan di antara umur ibu ($\chi^2 = 57.787$, $df=9$, $p<0.05$), tahap pendidikan ($\chi^2 = 54.079$, $df=12$, $p<0.05$), pekerjaan ($\chi^2 = 132.590$, $df=24$, $p<0.05$), pendapatan keluarga ($\chi^2 = 45.854$, $df=12$, $p<0.05$) dan bilangan anak ($\chi^2 = 80.343$, $df=9$, $p<0.05$) dengan cara penyusuan dan pemberian makanan kepada anak. Majoriti ibu-bapa memberi makanan kepada anak-anak semasa anak-anak berumur 4 bulan dan 5 bulan dan bubur nasi diberi sebagai makanan pertama (52.7%). Sebahagian ibu bapa pula memberi makanan bayi komersial 52.7% kepada anak-anak. Faktor utama yang diberi perhatian semasa pembelian susu formula untuk anak-anak adalah faktor harga (78.7%), pembungkusan (55.8%) dan nilai nutrisi (49.5%). Analisis pricipal komponen menunjukkan kemudahan dengan 25.5% perbezaan, kesedaran kesihatan (20.05) dan harga (16.3%) merupakan kriteria yang penting semasa pembelian susu bayi. Penemuan daripada kajian ini memberi kesimpulan bahawa walaupun penyusuan ibu dipraktik secara berleluasa tetapi pemberian susu ibu secara eksklusif tidak begitu dipraktikan dan pemberian makanan secara awal banyak diamalkan oleh ibu-bapa.



SYMBOL AND ABBREVIATION LIST

±	Standard deviation
%	Percentage
χ^2	Chi-square
g	gram
mg	milligram
kcal	Kilo calories
PUFA	Polyunsaturated fatty acids
CMPI	Cow's milk protein intolerance
WHO	World Health Organization
WABA	World Alliance for Breastfeeding Action
FAOSTAT	Food Agriculture Organization Statistic
AAP	American Academy of Paediatric
MOH	Malaysia Ministry of Health
UNICEF	United Nations Children's Fund
RNI	Recommended Nutrient Intake
CODEX	Codex Alimentarius Commissions
IEC	Information, education and communication
BFHI	Baby-Friendly hospital initiative
SPM	Sijil Pelajaran Malaysia
STPM	Sijil Tinggi Pelajaran Malaysia



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CHAPTER 1

INTRODUCTION

Malnutrition continues to be a major health concern in developing countries. It is globally known to be the risk factor for illness and death particularly among young children. An estimated of 53 % of deaths among children under five years of age from 2002 to 2003 worldwide are associated with malnutrition (Müller & Krawinkel, 2005). While according the World Health Organisation (2003), two third out of 10.9 million death are linked to inappropriate feeding practices. For example, in Asia, many children do not archive their full growth and development potential because of malnutrition.

Nutrition is the most important key elements for children to grow and stay healthy. Therefore, parents play a vital role in recognising their child's needs. Through appropriate and the correct timing of infant feeding practices, a child can get its optimum nutrition he or she needs for growth. According to Anokwulu (2002), infant feeding practices can be divided into four categories which consist of breast-feeding, artificial feeding, mixed feeding and weaning. These practices have it fascinating changes from the past until the present day due to various factors such as of behavioural, internal personal and socio-environment (Williams, *et al.*, 1999).

Breast-feeding, formula feeding and weaning are important in a child life. The timing, the choice of foods and its amount introduced to a child, all affect the outcome such as the growth and development of a child (Amuna, *et al.*, 2000). Presently, the emerging of commercial baby foods has overtaken the traditional



home prepared foods and breast milk due to its convenience and availability in the market. Formula milks are extremely convenient because they allow the mother freedom to work outside the home (Yasmin, 2005). Hence, nowadays it is undeniable that parents would choose to formula fed their child instead of breast-fed.

The baby food industry which includes milk formula and other baby foods has becoming more competitive in the time being. In addition, parents as a consumer are becoming more particular in their selection of baby foods. As what Nazlin Imran (1999) mentioned in his research paper, there is more demand by consumers for value added food products instead of for greater quantities of food. This can be applied in the context of baby food since every parent wants the best for their children. Since then, baby food manufacturer has been competing with each other to produce the best of baby foods to meet the parents demand.

The success of commercial baby food has been changing the trend of infant feeding practices worldwide including Malaysia. Today, there are various options of infant formulas available in the market such as soy formula, lactose free formulas, formula with added rice starch, protein hydrolysed, preterm infant formula and formulas for infants with special conditions (Alles, Scholtens & Bindels, 2004). But, new formula continues to developed, and existing formulas undergo frequent modifications. Still, the aim for the manufacture is to make the composition of the infant formula prior to consumption as biologically close to human milk as possible (Foster & Sumar, 1997).

According to Euromonitor (2005), the retail sales of baby food has increased from RM814.96 million in 2003 to RM840.03 million in 2004. More Malaysian are



buying commercial baby foods for their child and concerned that the breast-feeding rate will decline, The Ministry of Health and Malaysian Breastfeeding Association (MBA) has been working very hard to educate and promote breastfeeding amongst Malaysian mothers. Various-related programmes have been implemented to assess, analyse and monitor the infant feeding issues mainly on breast feeding. Every year from first until seventh of August, World Breastfeeding Week is celebrated in over one hundred twenty countries. In 2005, the World Alliance for Breastfeeding Action (WABA) choose the theme "Breastfeeding and Family Foods: Loving & Healthy" to encourage mothers to continue breastfed their child up until two years and beyond and start feeding complementary food at six months (WABA, 2005).

Trend in infant feeding practices have been associated and influenced by a number of social and individual factors (Binns *et al.*, 2004). The attitudes and practices of infant feeding among parents may differ according to their socio-demographic, social support, and cultural influences. In a study by Zulkifli Ahmad, Daw & Abdul Rahman Isa (1996) in Tumpat, Kelantan, they found out that nearly all the mother breastfed their children due to stronger traditional practices compared to other parts of Peninsular Malaysia. Another research by Manan (1995) in Terengganu noted that although breast-feeding is widely practiced, however, their duration has decreased and early introduction of solid foods is widespread among the lower educational strata of women. Most of the research is carried out in the rural part of Kelantan such as the study by Zulkifli Ahmad, Daw & Abdul Rahman Isa (1996) in rural part of Tumpat thus it is important to study the infant feeding practices in the urban area. This is because different locations may have different infant feeding practices among parents. Therefore, this study is conducted to determine the infant



feeding practices among parents in urban areas of Kelantan and their behaviour towards baby foods.

The specific objectives were:

1. To determine the recent trends of infant feeding practices among parents in Kota Bharu, Kelantan.
2. To determine the factors that influence infant feeding practices among parents.
3. To evaluate attribute that influences the purchasing patterns of baby food on parents of Kota Bharu, Kelantan.



CHAPTER 2

LITERATURE REVIEW

2.1 The optimal nutrition for infant and children

Nutrition is the most crucial factors that influence the growth and development of an infant as the brain cells increase most rapidly during the first 5 or 6 months after birth (Yasmin, 2005). However, nutritional needs vary during the first year of life according to the infant's individualized pattern of growth and amount of physical activity (Bronner & Paige, 1992). After delivery, infant must make many physiologic adjustments, develop immunologic defences and take in adequate nutrients for survival. As mentioned by Askin & Diehl-Jones (2005), adequate levels of nutritional intake and utilization are critical for optimal growth. Through infant feeding practices, a child can gain its optimum nutrition including carbohydrates, proteins, fats, vitamins and minerals during its first four to six months of life. The nutrient requirements at this age can be met either through breast milk or formula milk. As the child grows, complementary foods will be then introduced to meet their nutrient intake.

2.1.1 Energy requirements for infant and children

Energy is important in human nutrition as our body need it to maintain body temperature and metabolic activity. As for infants energy is needed to support growth. Proteins, carbohydrates and lipids are the major contributors to energy that needed by infants and children. Energy demands vary widely, depending on conditions and diseases affecting the infant (Kempley, Sinha & Thomas, 2005). As noted in Table 2.1, the recommended energy intakes for infants aged 0-5 months

need around 540 kcal and aged 6-11 months need around 640 kcal for both boy and girl. Apart from that, as reported by Phillips & Sherman (2002), the total energy intake in breast-fed babies is lower than it is in bottle-fed babies due to difference in activity level and sleep state between these two groups. Total energy requirement naturally increase as the infants grow, and are higher in boys than girls due to differences in weight (Butte, 2005).

2.1.2 Nutrients intake for infant and children

2.1.2.1 Lipids

Lipids play three key biological roles in human body primarily provide energy; form part of the membrane surrounding each cell and act as precursor of chemical messenger (Sinclair, 2000). They provide the essential fatty acids which are linoleic acid (LA) and alpha (α)-linoleic acid (ALA). These compounds play important roles in tissue, organ growth and development, which take place very actively during the first months of life (Marangoni *et al.*, 2002). Human milk contains an average 7.2g of linoleic acid per 100g total fatty acid. It is recommended that infants and young children should intake at least 1 percent of total energy and alpha linoleic acid at least 0.2 percent of total energy (Morgan, 2001).

2.1.2.2 Proteins

The main goal for protein intake is to provide adequate quality and quantity for optimal nitrogen retention without metabolic stress, such as uraemia or distorted blood amino-acid profiles (Kempley, Sinha & Thomas, 2005). The recommended intake for infants both boy and girl aged 0-5 months and 6-11 months is 11g and 12g respectively and this requirement increased as they grow. Protein may serve as a



source of energy. Failure to meet the energy needs decreases the efficiency of protein utilisation for tissue accretion and other metabolic function (WHO, 2002).

The major problems of protein deficiency are protein energy malnutrition. It usually manifests early especially in children between 6 months and 2 years of age and usually associated with low-protein diet (Rice *et al.*, 2000). Therefore, to avoid protein deficiency, infants should fulfil their protein requirement through breast milk as protein content of mature human milk is approximately 8 – 10g/L (WHO, 2002). As for young children, food sources such as meat, fish, eggs and milk (Davies & O'Hare, 2004). However, parents with different culture will introduce different types of protein foods to their child. In rural Cebu, Philippines, cereal staples mainly rice and maize were the major source of protein (Perlas, Gibson & Adair, 2004).

2.1.2.3 Minerals and vitamins

Iron intake is important in a child life where it served as metabolic or enzymatic function to support growth of a child (WHO, 2002). Newborn infant will, in principle, be exposed to two sources of iron mainly lactoferrin-bound iron (+III) and loosely complexed non-heme iron (+II) (Lönnerdal, 2005). By about 6 months of age, term breast-fed infants require an additional source of iron in their diets (Butte *et al.*, 2004). Because of the considerable iron requirement for growth and the marginal supply of iron in infant diets, iron deficiency is prevalent among infant between 6 and 12 months of age (WHO 2002). Infant aged 6 – 11 months required 0.93mg/day of iron which can be met either through breast feeding or from food. This is to prevent iron deficiency anaemia during the first year of life (Alberico *et al.*, 2003). For children aged 1-3 years and 4-6 years need a total intake of 0.58mg/day and



0.63mg/day of iron respectively. Good sources of iron includes meats especially red meat and iron-fortified infant cereal (Butte *et al.*, 2004).

Another essential nutrient that infants need is calcium. However, the recommended intake is different from breast-fed and formula fed infant which is 300mg/day and 400mg/day respectively. This is because absorption of calcium is 55% - 60% from human breast milk, while that from infant formula is lower at 40% (Malaysia Ministry of Health, 2005).

Table 2.1: Recommended Nutrient Intake (RNI) of Malaysia 2005

Age	Infants				Children				
	Boys		Girls		Boys		Girls		
	0-5 months	6-11 months	0-5 months	6-11 months	1-3 years	4-6 years	1-3 years	4-6 years	
Energy (kcal)	560	640	550	630	980	1340	910	1290	
Protein (g)	11	12	11	12	17	23	17	23	
Calcium (mg)	300(<i>bf</i>) 400(<i>ff</i>)	400	300(<i>bf</i>) 400(<i>ff</i>)	400	500	600	500	600	
Iron(mg)	10%	<i>b</i>	9	<i>b</i>	9	6	6	6	6
Bioavailability	15%	<i>b</i>	6	<i>b</i>	6	4	4	4	4
Iodine (µg)	90	120	90	120	72	108	72	108	
Zinc (mg)	11(<i>bf</i>) 28(<i>ff</i>)	3.7	1.1(<i>bf</i>) 2.8(<i>ff</i>)	3.7	4.1	5.1	4.1	5.1	
Selenium (µg)	6	9	6	9	17	21	17	21	
Thiamin (mg)	0.2	0.3	0.2	0.3	0.5	0.6	0.5	0.6	
Riboflavin (mg)	0.3	0.4	0.3	0.4	0.5	0.6	0.5	0.6	
Niacin (mgNE)	2	4	2	4	6	8	6	8	
Folate (µg)	80	80	80	80	160	200	160	200	
Vitamin C (mg)	25	30	25	30	30	30	30	30	
Vitamin A (µg)	375	400	375	400	400	450	400	450	
Vitamin D (µg)	5	5	5	5	5	5	5	5	
Vitamin E (mg)	3	3	3	3	5	5	5	5	

* *bf*– Breast feeding, *ff*– formula feeding
(Source: Ministry of Health Malaysia, 2005)



2.2 Infant feeding practices

Starting from birth, a child will go through stages of eating behaviour from breastfeeding to the first introduction of solid foods. Infant feeding practices which include breast – feeding, artificial feeding (infant formula), mixed feeding and weaning or complementary practices has been the most important tradition way a child can get its nutrients. Each of this practice has their own recommendation by the recognised authorized body such as World Health Organisation (WHO), World Alliance for Breastfeeding Action (WABA), Malaysia Ministry of Health (MOH) as well United Nations Children’s Fund (UNICEF). Infants are term as person up to 12 months of age and children means any person from the age of more than 12 months up to the age of three (WHO, 2002).

Nutrition during the first years of life is a major determinant of growth and prevention of diseases. Many researches proved that suitable feeding method is vital in supplement the right nutrition for a child. As what Duong, Binns & Lee (2004) reported, appropriate feeding practices include breastfeeding and complementary feeding are universally accepted as essential elements for the growth and development of infants. Besides that, experiences in the early life are also important because may program preferences and track into adolescence. Understanding the factors that cultural feeding practices and the formation of food preferences are important to improve children’s eating habits and reduce their risk factors associated with obesity and other chronic diseases (Mennella, 2006).

2.2.1 Breast feeding

It has been generally recognised that human breast-milk is the most adequate nutritional requirements for a healthy full-term infants. Breast-milk is well-balanced in



protein, fat, carbohydrate, minerals and vitamins. It is also considered nutritionally and therapeutically adequate for infant feeding (Sarkar, 2003). According to WHO (2003) in 'Global Strategy for Infant and Young Child Feeding', it is recommended that infants should be exclusively breast – fed for the first 6 months of life and continues for up to 2 years of age after introduction of complementary foods. This is to ensure that optimal growth, development and health can be achieved (Gau, 2004).

Exclusively breast feeding is defined as infant having only breast milk since birth, no water, infant formula or other liquid or non milk food (Heath *et al.*, 2002). Studies had shows that infant mortality is lower among breast-fed infants than non-breast-fed infants (Betran *et al.*, 2001). This is because human milk contains the protective agent that needed for infants to grow healthy. Besides that, it is also agree internationally that breast-feeding confers a number of health advantages to the infant. These include protection against infection, atopic disease, cognitive and motor development, decrease wheezing, decrease otitis media and others (Cadwell, 2002).

2.2.1.1 Composition of breast-milk

Nutrients secreted in human milk vary and reflect individual biochemical variability among women, the diet consumed, the stage of lactation, and the length of time the mother has breast – fed (Flack & Shaw, 2003). The first milk that secreted by human is colostrums. Colostrum, yellowish in colour and sticky in characteristic is specialised milk produced for the first few days after delivery (Sarkar, 2004). According to WHO (1997), colostrums is energy – dense and rich in protective antibodies and vitamins E and A. The protein present in colostrum is secretory immunological A (sIgA) which functions to protect the gut from infection (Flack & Shaw, 2003). Research done by Brennan, McDonalds & Shlomowitz (2004) in India found out that colostrum can



reduce the risk of stunting and severe stunting among children. There are two types of milk breast present namely 'foremilk' and 'hindmilk' (WHO, 1997). Generally, foremilk is more watery and its function is to quench the baby's thirst whereas hindmilk is the nutritional part of breast milk. It is rich in fat and provides the energy – dense part of the feed.

Human milk composed of lipids which support normal growth of an infant. Lipids represent the main source of energy for breast-fed infant and supply essential nutrients such as fat-soluble vitamins and polyunsaturated fatty acids (PUFA) (Koletzko *et al.*, 2001). Human milk contains the essential polyunsaturated fatty acids linoleic and α -linoleic acids, as well as their long chain derivatives, arachidonic (AA, C20:4, n6) and docosahexaenoic acids (DHA, C22:6, n3) which have different biological functions (Vaquero, Veldhuizen & Sarriá, 2001). One specific n-3 fatty acid which is α -linolenic acid believed to provide nutrients for optimal development of the brain such as visual development, information processing skills and IQ (Thorpe, 2003).

Breast milk has been recognised as the vital source of nutrition for a healthy full-term infant. It is a hygienic source of energy, essential nutrients, and water (Kakute, *et al.*, 2005). Early and sustained breastfeeding is beneficial to infants. This is because breast milk contains the mix of nutrients best suited to the infant's metabolism and contains natural immunities protecting the child from infection (Brennan, McDonald & Shlomowitz, 2004). Generally, the chemical content of breast milk is different compare to other milk such as cow milk (Table 2.2). Human milk is richer in vitamin C, vitamin A, and lactose but it is low in vitamin B and protein as



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