

WEANING PRACTICES AND WEANING FOODS OF MALAYS IN KOTA
BHARU, KELANTAN

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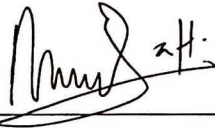
THESIS SUBMITTED IN FULLFILMENT OF BACHELOR OF HEALTH
SCIENCES (NUTRITION)

UNIVERSITI SAINS MALAYSIA
SCHOOL OF HEALTH SCIENCES

2013

DECLARATION

I hereby declare that the thesis is my original work except for the quotations and citations which have been duly acknowledged. I also declare that it has not been previously, and is not concurrently submitted for any other degree or purposes in Universiti Sains Malaysia or at any other institutions.



NURUL MUNIRAH BINTI MOHD SUPPIAN

Date: 4th JULY 2013

I certify that Ms Nurul Munirah Binti Mohd Suppian has carried out her study entitled Weaning Practices and Weaning Foods of Malays in Kota Bharu, Kelantan as a final year research project in nutrition under my supervision. She has complied with the ethical standard and regulations in conducting her study and has completed writing her thesis. I am satisfied with her work and have no objection for the thesis to be examined by the appointed examiners by the School of Health Sciences, Universiti Sains Malaysia.

Thank you.



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ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and the Most Merciful. By His will and favor, I finally succeed in completing final year research project and thesis entitled Weaning Practices and Weaning Food of Malays in Kota Bharu, Kelantan. Firstly, I would like to express my heartfelt gratitude to my supervisor, Dr Sharifah Zahhura Binti Syed Abdullah for her endless help in extending her valuable knowledge to me while completing this research. Besides, I would like to thank her for all good things that she did in regards of her concern, kindness and full support during the whole process I handled the project. Furthermore, I would like to extend my appreciation to my lovely friends for their helps, supports and ideas during the whole process of completing this thesis. Special thanks thank to all of my supportive lecturers for their support and cooperation either directly or indirectly right from the beginning until the final completion of this thesis. Many thanks to my parents and family for their endless love and support during my ups and down of handling this projects. Last but not least, I also would like to thanks Universiti Sains Malaysia (USM), particularly School of Health Sciences, and Ministry of Health for giving me opportunity to handle this project, gain new knowledge and valuable experiences during the whole process in completing this thesis.

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LIST OF ABBREVIATION

WHO	World Health Organization
UNICEF	United Nation's Children Fund
PAHO	Pan American Health Organization
HIV	Human Immunodeficiency Virus
UK	United Kingdom
SACN	Scientific Advisory Committee on Nutrition
ESPGHAN	European Society For Paediatric Gastroenterology, Hepatology And Nutrition
MDG	Malaysian Dietary Guidelines
MOH	Ministry Of Health
GIT	Gastrointestinal
IYCF	Infant And Youth Child Feeding
FFQ	Food Frequency Questionnaires
SPSS	Statistical Package for the Social Science
CARE	Cooperative for Assistance and Relief Everywhere
SPM	<i>Sijil Pelajaran Malaysia</i>
STPM	<i>Sijil Tinggi Pelajaran Malaysia</i>
PMR	<i>Peperiksaan Menengah Rendah</i>
RM	<i>Ringgit Malaysia</i>
UHT	Ultra-High Temperature
UAE	United Arab Emirates
DONALD	DOrtmund Nutritional and Anthropometric Longitudinally Designed
IQR	Interquartile Range

ABSTRAK

Amalan pemberian makanan pelengkap adalah penting bagi menyediakan nutrisi yang mencukupi untuk bayi apabila susu ibu tidak lagi boleh memberikan sumber nutrisi yang secukupnya. WHO mengesyorkan para ibu untuk memulakan amalan pemberian makanan pelengkap apabila bayi mencecah usia 6 bulan. Corak pemakanan bayi berubah dari semasa ke semasa. Kajian berkaitan makanan pelengkap bayi adalah penting untuk mengetahui pilihan ibu dan bayi. Kajian ini bertujuan memberi gambaran mengenai corak amalan pemberian makanan pelengkap dan jenis pilihan makanan dalam kalangan bayi berbangsa Melayu di Kota Bharu, Kelantan. Kajian keratan rentas ini dijalankan dalam kalangan para ibu yang menghadiri lima klinik kesihatan kerajaan yang terpilih di sekitar Kota Bharu, Kelantan. Kajian ini dijalankan dengan menggunakan kaedah persampelan bertujuan. Seramai 105 responden yang berjaya melengkapkan boring soal-selidik, borang ingatan diet 24 jam, dan Borang Kekerapan Makanan telah dimasukkan ke dalam kajian ini. Pra-ujikaji telah terlebih dahulu dijalankan terhadap borang soal selidik. Survei ini dijalankan secara temubual di mana informasi daripada responden telah diisi sendiri oleh pengkaji. Hasil kajian menunjukkan bahawa sebanyak 73.3% bayi memulakan pengambilan makanan pelengkap ketika berusia 6 bulan. Manakala purata umur bagi pengenalan kepada makanan pelengkap adalah selari dengan garis panduan yang disyorkan oleh WHO. Kajian juga menunjukkan faktor yang mempengaruhi pemberian makanan adalah pendapat dari para ibu sendiri diikuti oleh tingkah laku bayi yang sering lapar, dan juga nasihat daripada sekeliling. Sebahagian daripada para ibu (54.3%) memilih untuk menyediakan kombinasi makanan yang disediakan sendiri dan juga produk komersial dalam diet harian bayi. Selain itu,

kajian mendapati corak pemberian makanan pelengkap berubah seiring peningkatan usia bayi. Majoriti bayi yang lebih berusia hanya mengambil makanan yang disediakan di rumah, sementara produk komersil lebih dominan pada peringkat usia yang awal. Majoriti responden mendapatkan nasihat berkaitan pemberian makanan pelengkap daripada doktor dan pengamal kesihatan, ibu mereka, dan juga informasi daripada majalah atau akhbar. Hasil kajian juga mendapati bahawa jenis makanan harian yang diberikan ialah beras, ayam, ikan laut, dan juga air kosong. Sementara itu, telur ayam, sayur-sayuran berkanji, sayur-sayuran berdaun hijau, buah-buahan seperti pisang, epal dan betik, serta biskut dan juga kuih tempatan diberikan secara mingguan. Pengambilan kekacang dan produk susu sangat sedikit. Kajian juga mendapati bahawa tiada perbezaan yang signifikan di antara tahap pendidikan ibu dan juga umur bayi ketika memulakan pengambilan makanan pelengkap, dan juga tiada perkaitan yang signifikan di antara pendapatan seisi rumah dan pilihan makanan pelengkap. Amalan pemberian makanan pelengkap bayi menepati seperti yang disyorkan oleh WHO. Pemberian makanan adalah berbeza antara kumpulan dan hanya tertumpu kepada sebahagian jenis kumpulan makanan.

ABSTRACT

Weaning practices is crucial in providing adequate energy and nutrients to infants when breast milk can no longer acts as the primary source for adequate nutrition. WHO had recommended mothers to start weaning practices when the infants reach 6 month of age. Weaning foods selection changes over the time. Study regarding weaning food is important to see selection and preferences of weaning foods by mothers and their infants. This research aimed to describe weaning practices and types of weaning foods introduced to infants of Malays mothers in Kota Bharu, Kelantan. This study was a cross-sectional study conducted among mothers attending the five selected government health clinics in Kota Bharu, Kelantan by using purposive sampling. 105 respondents who completed a set of pre-tested interviewer-administered questionnaire; 24-hour diet recall form and Food Frequency Questionnaires (FFQ) were included in the analysis. Findings showed that majority of 73.3% children started weaning at the age of 6 months. The mean for weaning age among infants in Kota Bharu is in parallel with WHO's recommended guidelines. The study also showed that introduction of weaning was primarily influenced by mother's instinct to start weaning, infants showing signs of hungry and advice from the surroundings. More than half of respondents (54.3%) chose to wean their children by using combination of home-made food and commercial food products rather than focusing only on one type of food. Besides that, this study found that weaning food selection pattern changes over the age. Older infants were fed primarily by home-made foods. Meanwhile commercial food product was only prevalent during the early age of weaning. The main source for weaning information was obtained from doctors and health practitioners, followed by respondent's

mothers, and information on magazines or newspapers. The study showed that in daily basis, most selected food for weaning is rice, poultry, sea fish, and plain water. Meanwhile, in weekly basis, most selected foods includes chicken eggs, starchy and dark-green leafy vegetables, fruits such as bananas, apple and papaya, also biscuits and local delicacies. Legumes and milk product were seldom selected among weaning foods. There was no significant difference between maternal education and age infants started to wean, and no association was found between household income and selection of weaning food types. Weaning timing of children in Kota Bharu had good compliance with the recommendation age. Weaning food selection varies among the children, but only focus on certain food groups.

CHAPTER ONE

INTRODUCTION

1.1 Overview of Weaning

Weaning is a process of which every infant will encounter in an early age. The process involves the roles of mothers and family supports in supplying and providing their infants with the best nutrition. Children at the early stage of life especially below two years are the most at risk of malnutrition, and also over-nutrition.

Period aged of 0 to 23 months is a critical period in improving health and development of children. Appropriate and optimal infant and young child feeding in their critical period of life is important for physical growth, motor development and it is also ranked among the most effective interventions to improve child health in later life. The linear growth retardation acquired early on infancy cannot be easily reversed after the second year of life.

WHO (2009) had reported that poor nutrition during this golden period of life may increase the risk of illnesses, whereas inappropriate nutrition can also lead to childhood obesity, which is an increasing public health problem globally. This is because infant and young child feeding practices will directly affect the nutritional status of children under two years of age, and therefore giving impact to child survival (WHO, 2009).

Within the first six months of life, breastfeeding is the best way for infants to have optimal nutrition and it is adequate in providing best nutrition. Breast milk alone can provide infant with adequate energy, nutrients and minerals needed and also other

protection qualities such as increase in immune functions. This is in parallel with WHO recommendation and UNICEF's global recommendation for optimal infant feeding as reported in the *Global Strategy for Infant and Young Child Feeding(2003)* to give exclusive breastfeeding for 6 months. However, up to 6 month, complementary feeding is necessary for infants to compensate their increase needs of energy and nutrients. At this age, breastfeeding alone is not sufficient for infant to meet nutritional requirements and giving complete nutrition. Therefore,WHO and UNICEF recommends that nutritionally adequate and safe complementary feeding should start from the age of 6 months with continued breastfeeding up to 2 years of age and beyond (WHO/UNICEF, 2003).

The introduction of complementary food is necessary to support infant's growth along with the breast milk. This process is called weaning, which is a process of gradually replacing breast milk, by solid foods as the main source for both macronutrients and micronutrients and energy. This is the transitional process between milk, a unique single food, towards a diversity of family foods (Davies and O'Hare, 2004).

Purpose of weaning includes providing energy and nutrients when breastfeeding alone can no longer supplies infants in sufficient amounts, primarily the iron, protein and calcium. Weaning helps maintain optimal growth and development healthily. In addition, weaning serves as an opportunity for infants to develop their sense of taste, therefore they will be more tended towards new foods, tastes and textures of the foods (Nicklaus, 2011).

Proper complementary foods needs to be nutritionally adequate, safe, and appropriately prepared in terms of hygiene and also appropriately fed to meet infant's requirements. It is in conjunction to principle guidelines of complementary feeding set out by WHO to feed a variety of nutrient-rich foods to ensure that all nutrient needs are met (WHO, 2009). Nutritionally adequate complementary foods should consists of variety types of foods that are rich in energy and in micronutrients especially iron, zinc, calcium, vitamin A, vitamin C and folates (PAHO/WHO, 2003). Complementary foods should be varied and include adequate quantities of meat, poultry, fish or eggs, as well as vitamin A-rich fruits and vegetables every day. On top of that, within the population that facing difficulty to meet the nutrition requirements, use of fortified complementary foods and vitamin mineral supplements may be necessary to ensure adequacy of particular nutrient intakes (WHO, 2003).

However, to meet the requirements for child's needs during the complementary feeding is a big challenge especially among the populations that experienced lack of nutritional education, low socio-economic income, and having difficulty in accessing foods, especially in the less developed countries, as well as towards some infants that are at risk of under-nutrition such as pre-term, or low-birth-weight infants, and infants born to HIV-infected mothers (WHO, 2009).

Increasing awareness and nutritional knowledge towards mothers should be implemented. Engagement of healthcare professionals with society more closely may help mother and caregivers ideas on how to give sufficient nutrition to their infants. Optimal complementary feeding depends not only on what is fed, but also how, when, where, and by whom the child is fed. The ideas of 10 principles guidelines of

complementary feeding released by the WHO should be elaborated and explained among mothers for proper weaning practices (WHO, 2009).

1.2 Definition

1.2.1 Weaning

Weaning is defined as a process of introduction of solid feeding and the gradual replacement of milk either human milk or formula milk or both by solid food as the main source of energy and nutrients (Marriott *et al.*, 2003). Meanwhile WHO defines weaning as the gradual cessation of breastfeeding and the introduction of complementary feeding, which is the provision of any nutrient containing foods or liquids other than breast milk and includes both solid food and infant formula (WHO, 2009).

1.2.2 Complementary Feeding

Complementary feeding is defined as the feeding process starting when breast milk is no longer sufficient to meet the nutritional requirements of infants, and therefore other foods and liquids are needed, along with breast milk. The target range for complementary feeding is generally taken to be 6 to 23 months of age, even though breastfeeding may continue beyond two years. However, these recommendations may be adapted according to the needs of infants and young children in exceptionally difficult circumstances, such as pre-term or low-birth-weight infants, severely malnourished children, and in emergency situations. Specific recommendations apply to infants born to HIV-infected mothers.

1.3 Problem Statement

Nutrition in the early years of life is a major determinant of growth and development. Weaning practices also have significant implications for infant health, notably in relation to normal development, mineral balance and also development of obesity in later period of life. Malnutrition is the most common health impact among the children. When breast milk can no longer support sufficient nutrition, infants depend on complementary food. WHO reported that malnutrition among infant and child is because of complementary foods often contained lesser nutritional quality than breast milk. In addition, they are often given in insufficient amounts and, if given too early or too frequently, they displace breast milk (WHO, 2003).

Alarming statistics documented by Bhutta *et al.*, (2008) which there is of an estimated 178 million children aged younger than 5 years who are stunted, and most of them live in sub-Saharan Africa and South-central Asia. Within the numbers, problems that arise involved wasting, and severe wasting or severe acute malnutrition (Bhutta *et al.*, 2008). It is proven that poor growth occurrence are due to inadequate breastfeeding, inappropriate complementary feeding practices (Lutter, 2003; PAHO/WHO, 2003) and also infectious disease that lead to diarrhea and other illnesses (Foote and Marriott, 2003., PAHO/WHO, 2003). Instead of malnutrition, improper time of starting weaning caused few illnesses that associated with physiological disorder.

Recent studies had found that infants that start to wean early are associated with early introduction of infant formula and discontinuation of breastfed as factors independently (Giovannini *et al.*, 2004). Harmful short and long term health implications of both early and delayed weaning are well documented. Furthermore, early

weaning onto solids has been associated with increased risk of allergy, eczema, and enteritis (Tarrant *et al.*, 2010). Previous studies had also stated that early weaning less than 12 weeks may lead to increasing incidence of respiratory illness (Forsyth *et al.*, 1993) and increased percentage of body fat during childhood (Wilson *et al.*, 1998). Meanwhile, in the opposite, late and delayed introduction of weaning food from the recommended period were likely to affect feeding behavior, nutritional deficiencies, and also failure to thrive (Tarrant *et al.*, 2010).

A systematic review by Wijndaele *et al.*, (2009) found that strong evidence of early weaning is associated with young maternal age, low maternal education, low socio-economic status, absence or short duration of breastfeeding, maternal smoking and lack of information or advice from healthcare provider. Meanwhile, strong factors that caused early introduction of cow's milk are low maternal education and low socio-economic (Wijndaele *et al.*, 2009).

In addition, another comparison study carried out between Japan, France and United States by Negayama *et al.*, (2012) had found significant common reasons that causes stopping of breastfeed and leads to early weaning among mothers in these three countries are mainly due to perceived insufficiency of breast milk, back to work, child's refusal or disinterest to be breastfed, and increased age of child especially during 9 to 12 month.

Introduction of complementary food into infants vary within level of socio-economic for each family, and it is predominantly influenced by a variety of factors. Those factors contribute to the practice of society in their individual ways such as

education, customs, religion, belief, food taboos that flows within their culture, medical opinion and dietary fads (Davies and O'Hare, 2004). While in developing country, people experiences societal change that lead to major changes in dietary practices. Nowadays, world had moved to the era of increasing number of woman being educated and had skills and capability in joining the employment either in private sector, or public sector. Eventually, the shifts of this scope of daily life activities within females has leads in declining incidence of woman that give exclusive breastfeeding to their infants, shorter duration of breastfeed, and early introduction of complementary food (David *et al.*, 1983).

This is the case occur in Malaysia where the country is going through urbanization. According to Manderson (1984), patterns of giving exclusive breastfeeding are slowly declining, followed with earlier introducing of artificial milk, and weaning their infants using commercially manufactured products. Recent study by Amin *et al.*, (2011) done among working mothers reported that 54% of mother breastfed less than three months, and only 12% of mother discontinued breastfeed after six months. The factors that influenced high rate of breastfeeding discontinuation are mainly because of lack of flexible time and inconvenient surroundings. For instance, there were no facilities for storage of breast milk such as refrigerators, in the workplace. Thus, these eventually become one of factors that influenced introduction of complementary foods to compensate nutrient intake.

Therefore, after consideration of problems and health implications reported through previous weaning practices studies, we noticed the important of infant feeding on health particularly in later life. Therefore, infant feeding practices within Malaysia

should be measured regularly as a preventive action to combat infant malnutrition and other health-related diseases in the future.

1.4 Objectives

1.4.1 General Objective

- To describe weaning practices and types of weaning foods introduced to infants of mothers in Kelantan.

1.4.2 Specific objectives

- To determine weaning age of Malay infants in Kota Bharu.
- To compare common age of children introduced into weaning practices with the age recommended by World Health Organization (WHO).
- To determine factors that influence the introduction of weaning
- To determine weaning foods selected among mothers and the reasons influencing the selection.
- To determine the difference of maternal educational level across weaning age.
- To determine the association between selection of weaning food and household income.

1.5 Hypothesis

1.5.1 Hypothesis 1

- H_{01} : There is no mean difference of weaning age of Malay infants in Kota Bharu with the WHO's recommendation.

H_{A1} : There is mean difference of weaning age of Malay infants in Kota Bharu with the WHO's recommendation.

1.5.2 Hypothesis 2

- H_{02} : There is no significant difference in weaning age across maternal educational level

H_{A2} : There is significant difference in weaning age across maternal educational level

1.5.3 Hypothesis 3

- H_{03} : There is no association between weaning food selection with income.
- H_{A3} : There is an association between weaning food selection with income.

1.6 Significance of Study

It is crucial to determine Malaysian's weaning practices nowadays. There are very little published data on weaning practices of infants in Malaysia. Therefore, public and responsible organizations are unable to see the real picture of infants feeding's progression in Malaysia, precisely in Kota Bharu.

Mothers and family members should pay attention in providing adequate nutritional requirement for children especially during infant period to avoid any illnesses that may arise and develops in later life of the children. Thus, this study is significance to be carried out in revealing weaning practices of the Malaysian, specifically around Kota Bharu, Kelantan. Indeed, Kota Bharu is a town that still having strong cultural influences in their lifestyle. Kota Bharu, which located at the East Coast of Malaysia, is known for its flowing culture and lifestyle trend especially towards foods since years ago.

CHAPTER TWO

LITERATURE REVIEW

2.1 Weaning Practices

2.1.1 Weaning Age

The 2001 World Health Organization's global strategy for infant and young child feeding revised its guidance and recommended exclusive breastfeeding for the first six months of birth, and introduction into complementary food at the age of 6 month with continued breastfeeding (WHO/UNICEF, 2003). However, some global debate circles around the optimal weaning age whether 4 month is also an optimal age for weaning, and it continues as the age gap from 4 to 6 months can be taken as optimal age to introduce solid food to infant's diet (Khakoo and Lack, 2004). Meanwhile, guidance from the European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) states that earliest introduction of solids should not be done before 4 months, or 17 weeks, and it remained as unchanged recommendation, unless under the specific advice and guidance of a healthcare professional (Agostoni *et al.*, 2008).

The WHO recommendation applies to the whole populations and it is acknowledged in the document that exclusive breastfeeding to six months could lead to iron deficiency in susceptible infants, growth faltering and other micronutrient deficiencies in some infants. Following the WHO's recommendation, in 2001 The UK Scientific Advisory Committee on Nutrition (SACN) reviewed the evidence from the 2001 World Health Organization's global strategy for infant and young child feeding and advised that, there is sufficient scientific evidence that exclusive breastfeeding for 6

months is nutritionally adequate. However SACN noted that early introduction of complementary foods is normal practice in the UK and that mothers do this for many valid personal, social and economic reasons. SACN therefore recommended that there should be some flexibility in the advice, but that any complementary feeding should not be introduced before the end of 4 months (17 weeks) (SACN, 2011).

The European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) and the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition reviewed the literature on complementary feeding for healthy term infants in 2008 and recommend that exclusive breastfeeding for around 6 months is a desirable goal. Whereas, complementary feeding onto solid foods should begin by 6 months but not before 4 months, and breastfeeding continues throughout weaning particularly the early stage (Agostoni *et al.*, 2008).

Malaysian Dietary Guidelines (MDG) has been parallel with WHO recommendation to practice exclusive breastfeeding from birth until six months. Introduction of complementary foods to baby should begin at the 6 month age. Besides that MDG had also recommends mothers to continue breastfeed the baby until the age of 2 years though baby has started eating complementary foods (MOH, 2010).

2.1.2 Weaning Practices Worldwide

Current practice of weaning around the world is varying. Age at introduction of complementary foods within some countries has been reviewed to be apart from the WHO's recommendation. In United Kingdom, solid foods were introduced early than recommended in which 51% of mothers introduced solid foods by 4 months in 2005 (SACN, 2011); In Italy, 34% of mothers reported to introduce solid food at the 4 months (Giovannini *et al.*, 2004); In Germany, about 16% mothers wean their infant before 5 months and almost all in the 4th month of life (Rebhan *et al.*, 2009).

Meanwhile, weaning practices in the developing country such as Uganda has reported 44.1% of infants started complementary feeding before the age of 4 months (Kikafunda *et al.*, 2003), and previous study carried out in Lahore, Pakistan reported that 42% of mothers added solid food to infants feeding at the age of 5 to 6 months (Manzoor *et al.*, 2009). Another previous study carried out in Podor which is a rural area located in West Africa, reported that mothers started to give complementary feeding at the mean age of 4 month (Schwartz, 2008).

Most of the countries either developed or developing countries have shown a remarkable of weaning practices below the ages of 6 month, which is mostly started at the 4 months of age. Malaysia is no exception, in which a study done in Malaysia, which is in Tumpat, Kelantan, reported that 59.3% of mothers had started weaning between 4 and 6 month (Ahmad *et al.*, 1996) and. Social, economic, culture, maternal as well as infants held their respective responsibility variables that to ensure population were

practicing weaning as WHO guidelines of weaning practices either between or within countries.

In case of pre-term and low birth weight infants, introducing the complementary food before the ages of 4 months might be demanded by babies themselves. Poor weight gain, and feeding problems such suckling difficulties have been a great concern among mothers. A studies to determine weaning guidelines for pre-term and low birth weight infants has proven that introduction of solid, starting from hospital discharge which focusing on high energy density and protein contents, improves growth rates, and iron status among these two categories of infants (Marriott *et al.*, 2003).

2.1.3 Weaning Food Introduction

Too early introduction of weaning and early cessation of breastfeeding has been reported to cause many complications towards infant's health. There are physiological determinants that must be taken concern throughout preparing for infant feeding, such as nervous system, gastrointestinal tract, and also kidney function. Initiating complementary feeds either too early or too late can lead to malnutrition. Physiologically, gastrointestinal and renal functions must be matured enough to sufficiently metabolize nutrients from complementary foods. Available data suggests that by the age of 4 months and above do only both organs function sufficiently (Agostoni *et al.*, 2008).

During early life of infancy which is mostly before the age of 4 months, gastrointestinal (GIT) organ is still maturing in order for preparation to digest and absorb

dietary nutrients. Gastrointestinal tract should be sufficiently motile to transport the food through the length of gut. During this period of time, infants are exposed towards infection in the gut. Here, human milk is needed to confer protection towards cells, protective substances, numerous chemical substances and also enzymes, which play a great role in preparation of weaning.

Besides that, gut also is preparing itself for diverse demand of obtaining nutrients from mixed diets by enhancing growth of epithelium. This preparation was aided by human milk that responsible to induce the release of growth hormone within the gut (Davies and O'Hare, 2004). 6 months old age was an ideal age to begin weaning process as gastrointestinal organs are ready and still maturing. Exposure to solids and the transition from high-fat to high-carbohydrate diet as a result of weaning are linked to hormonal responses which at the same time results in adaptation of digestive functions towards maturing of gastrointestinal system.

In the opposite, late introduction of weaning food from the recommended period is likely to affect feeding behavior, nutritional deficiencies, and also failure to thrive (Tarrant *et al.*, 2010).

2.2 Weaning Food

2.2.1 Relation of Weaning Food and Age

By the age of 6 months, an infant usually has weight of double than their birth weight. They are physically becoming more active. Hence, exclusive breastfeeding or any infant formula is not sufficient enough to support infants with adequate nutrition. Therefore, weaning food should be introduced. It should be given gradually to make infants adapt to these family foods. However, breastfeeding should not be left behind as it still supports infants with a large percentage of energy, nutrients, and minerals (WHO, 2009).

At the age of 6 months, infants are developmentally ready for other foods, in which digestive system is mature enough to digest protein, starch, and fat in a non-milk food (WHO, 2009). Giving of solid food should include variety type of foods. An initial first food could include cereal, baby rice mixed with the baby's milk, mashed potatoes, and food that is soft in texture and easy to be swallowed. At 4 months to 6 months, food intake during this time is mostly serves as a taster, which can be given by using spoon. However, at this time of period, milk continues to be essential for nutrient and energy consumption (Davies and O'Hare, 2004).

While at the age of 6 months to 8 months, solid food is seen as a large provider of the energy. Variety of food such as vegetables, meat, fruits should be added in infant's diet in order to give nutrition adequately (Davies and O'Hare, 2004). Variation of food offered to infants will provide infants with varied taste and texture for future acceptance of food (Nicklaus, 2011). This phase is considered as experimenting phase

where infants have flexibility able to put food into their mouth themselves and they show a lot curiosity to taste food (Davies and O'Hare, 2004). Food consistency should be gradually improved from time to time to ensure infant's satisfaction and in adapting to their requirement and abilities. Beginning at the age of 6 months, infants can be served in forms of mashed, pureed and semi-solid food. While their oral motor development continuously maturing through age, at 8 months, most infants are able to eat 'finger food' (WHO, 2003).

9 months and above age is a stage that begins to reflect a more mature diet towards family food. Most children can eat the same type of food that adult consumed. However, choking may occur due to shape or consistency of food that can cause lodge (WHO, 2003). The texture of food can be less pureed (Davies and O'Hare, 2004).

A study done in Malaysia regarding infant feeding's practices has found that mothers included a variety of food to infant's diet, in which they include both commercially manufactured product and also home prepared foods. Nestum has been viewed as healthy food for infants in commercial product categories. Meanwhile, rice porridge is popular among mothers in feeding their children (Manderson, 1984).

2.3 Conceptual Framework

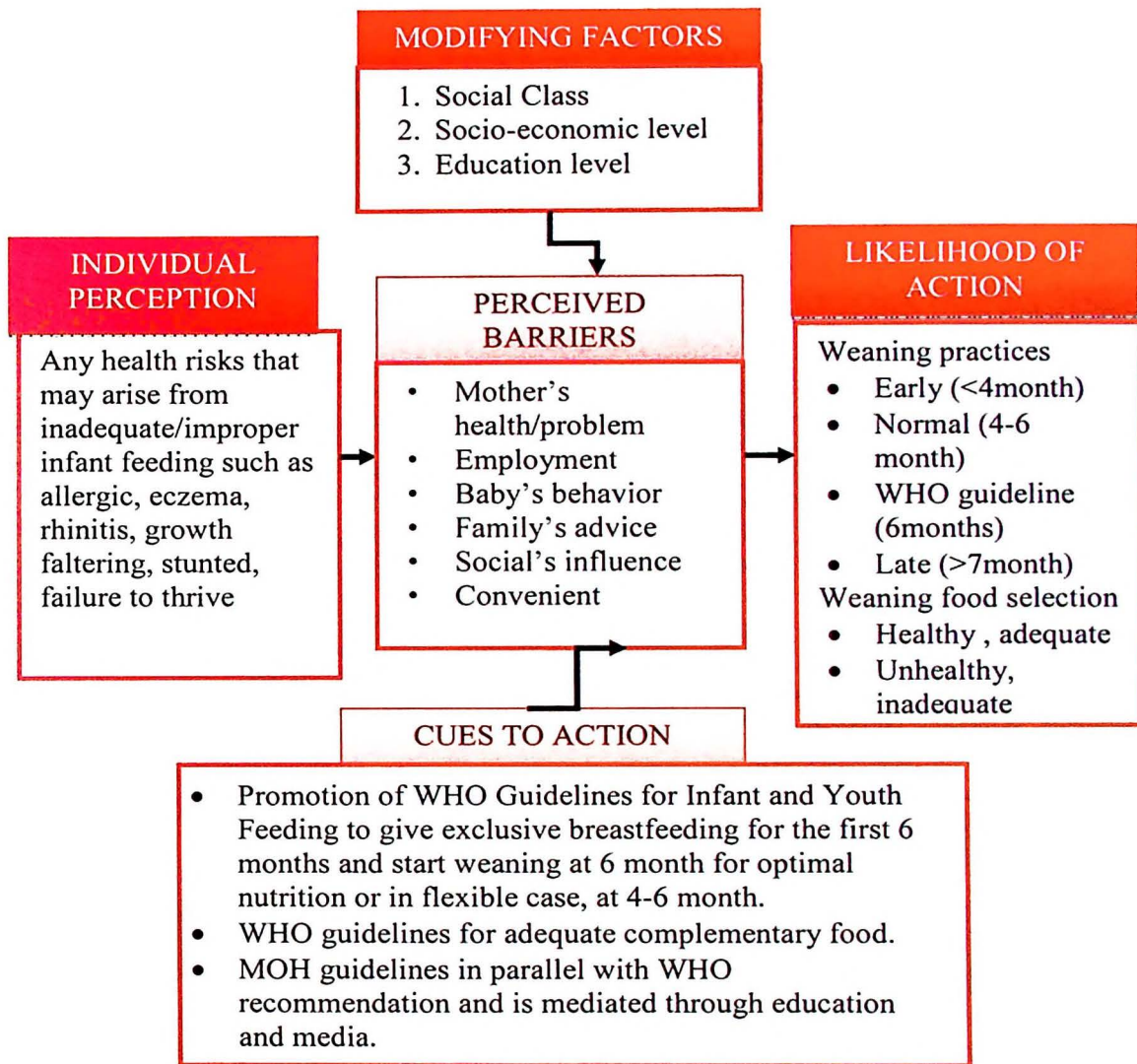


Figure 2.1: Conceptual Framework

The conceptual framework in this study is adapted based on Backer MH's Health Belief Model (Rosenstock *et al.*, 1988). This model addresses the relationship between a person's belief and behaviors. It provides a way of understanding and predicting how mothers will behave in relation to their health, socio-demographic factors, cultures and beliefs, and how they will comply with health guidelines. Proponents of the health belief model commented that mothers will take action themselves based on what they acknowledge from surroundings.

From the Figure 1.1 above, modifying factors, individual perception and cues to action has influenced weaning practices of the mothers. Meanwhile, perceived barriers are the factors that roots from the surrounding environments. Modifying factors such as socio-economic level, and educational levels may reflect how mothers practices weaning by the knowledge and their finance capability. Meanwhile, individual perception may arise from experience of family members and surrounding people that simultaneously gives the mothers an awareness regarding weaning. Whereas, cues to action, which is recommendation from international guidelines had gave an idea towards mothers on the right way to practices weaning.

However, perceived barriers commonly affect the initial decision and mother's idea to wean their children. Employment, mother's health, advise from others, and response from the children itself always affect weaning practices. Thus, the likelihood of action towards weaning practices may differ for each individual, or common, depending on the factors mentioned.

CHAPTER THREE

METHODOLOGY

3.1 Research Design

This research was a cross-sectional study using quantitative method, notably survey (questionnaires) and 24 hour dietary recall (adapted from IYCF questionnaire) and Food Frequency Questionnaire (FFQ). The questionnaire addressed on the socioeconomic status and demographic profile of the selected respondents. 24-hour diet recall and FFQ addressed the pattern of weaning food intake by the children. Quantitative method by means of survey involved questionnaire that designated to collect input of variables in numerical and concerns on the relationship of variables. It is designed to measure characteristics of the population with statistical precision. On top of that, quantitative research conducted by survey is able to quantify opinions, attitudes and behaviors (Punch, 2003).

3.2 Research Population

Target population of this study was the mothers or caregivers who had infants aged 0 months up until 2 years old and had started the complementary feeding. According to World Health Organization (WHO), infant are defined as children aged from birth to 12 months. As infant move into ages of 12 months to 36 months, they are commonly called as toddler. Children aged up to 24 month old were chosen for this study as weaning process usually takes place during this period of time (SACN, 2011). Mothers are referred to the person who gave birth to the children herself and was responsible for their feeding since birth until present time. Whereas, caregivers are referred to any people from the family members such as the father, aunts, and grandmothers that have fully responsibility in preparation and observation towards the infant's feeding.

3.3 Research Locations

From a total of thirteen government health clinics in Kota Bharu districts, four government health clinics were chosen by purposive sampling method. The four government health clinics include *Klinik Kesihatan Bandar*, *Klinik Kesihatan Kubang Kerian*, *Klinik Kesihatan Pengkalan Chepa*, and *Klinik Kesihatan Wakaf Che Yeh*. These four government health clinics were selected as these clinics were among of clinics that located at the center of Kota Bharu district. Therefore, a large number of mothers in Kota Bharu district attended these clinics for their infants's medical check-up and immunization. Formal permission to conduct this study was obtained from *Jabatan Kesihatan Negeri Kelantan*, followed by *Pejabat Kesihatan Daerah Kota Bharu* (see Appendix 7). Meanwhile, ethical approval for conducting this study was obtained from the Human Research Ethics Committee *Universiti Sains Malaysia (USM)* (FWA Reg. No: 00007718; IRB Reg. No: 00004494) with Ref no: UMSKK/PPP/JEPeM [260.4.(3.1)] (see Appendix 6). When permission to conduct this study was given by a formal letter from the responsible organizations mentioned above, the sampling process commenced. Upon conducting this study, informed consent was obtained from the respondents.

3.4 Sampling Size

Sample size is calculated according to formula by Daniel (Daniel, 1999; Naing *et al.*, 2006) as below:

$$n = \frac{Z^2 p (1-p)}{d^2}$$

Where,

n = estimated sample size

Z = standard value at confidence level at 95% = 1.96

p = estimated prevalence for infants starting wean at the age of less than 6 months in Gaza (2012)

d = margin error set at 5% = 0.05

Thus, based on a study conducted by Abu Hamad., (2012), the prevalence of infants who starts to wean from less than 6 months is 11.6%. Hence,

$$\begin{aligned}n &= \frac{(1.96)^2 (0.116) (1-0.116)}{(0.05)^2} \\ &= 157.5 \\ &= 158\end{aligned}$$

Considering of 20% drop-out rate, the desired sample size was **190**.

However, due to some limitations, only 105 respondents (55%) had participated in the study. Limitations of the study were explained later in the chapter six of this thesis.

3.5 Sampling Method

Purposive sampling was used to choose the research location. Clinics were chosen purposively based on their location that situated at the center of Kota Bharu district, which is near to USM, and also due to high attendance of mothers or caregivers in Kota Bharu district to these four clinics. Meanwhile, respondents were selected purposively based on the inclusion and the exclusion criteria. Purposive sampling, also called as judgmental sampling is the deliberate choice of an informant due to the qualities the informant possesses. It is a non-probability method that researchers applied purposively to find and select respondents who can and are willing to provide the information by virtue of knowledge or experience (Tongco, 2007).

3.6 Inclusion and Exclusion Criteria

3.6.1 Inclusion Criteria

There were some criteria that the respondents should meet to be included in this study. Mother and infants must be Malay. Only infants that aged up to 24 months (2 years old) were selected, and they must have already started the complementary feeding. Furthermore, mothers or caregivers enrolled must be the person that was fully responsible of providing infant feeding to the children in terms of preparation and observation. Besides that, mothers or caregivers should also be able to communicate and understand Malay language and were willing to give informed consent to continue participating in this study.