UNIVERSITI PUTRA MALAYSIA

ASSOCIATIONS BETWEEN MATERNAL KNOWLEDGE, ATTITUDE, FEEDING PRACTICE AND GROWTH STATUS AMONG CHILDREN WITH CEREBRAL PALSY IN SELECTED PUBLIC HOSPITALS, KUALA LUMPUR

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BY

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The project entitled “Associations between Maternal knowledge, attitude, feeding practice and growth status among children with cerebral palsy” was prepared by Muhammad Sufiyullah Bin Mohamad Nor and submitted to the Faculty of Medicine and Health Sciences as a partial fulfillment of the requirement for the degree of Bachelor of Science (Dietetics) from Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

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ACKNOWLEDGEMENT

Firstly, I am grateful to my Creator for the health and wellbeing which were needed during the completion of the thesis. I would like to express my sincere gratitude to my supervisor, Assoc Prof Dr Rosita Jamaluddin for all her guidance and assistance throughout the project. Without her endless patience, my project would not be accomplished.

Other than that, I would like to thank Abdul Rasyid Bin Ismail which is a postgraduate student for helping me out to complete data collection within the limited time. I am thankful and owe him a lot for his time and willingness to share his expertise.

Last but not least, I would like to express my special thanks to my parents, Mohamad Nor bin Deraman and Rosia Timah Binti Ngah, my friends especially Nur Shahira Binti Shaiful Azhar, my research teammates and my course mates who encouraged and helped me in finishing my research. I am thankful for all the help and guidance received.

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ABSTRACT

Introduction: Cerebral palsy children have high prevalence of impaired growth status and undernutrition. However, only a small number of studies aimed to determine growth status with the maternal knowledge, attitude and feeding practice. Thus, this cross-sectional study aimed to determine the associations of maternal knowledge, attitude, feeding practice, sociodemographic factors, medical history and dietary intake with growth status among children with cerebral palsy in Hospital Kuala Lumpur and Hospital Rehabilitasi Cheras. **Methods:** Socio-demographic information was obtained through self-administered questionnaire while anthropometry data in determining the growth status was performed by the researcher. Maternal knowledge and attitude were assessed through Knowledge and Attitude Questionnaire while maternal feeding practice was assessed by a validated self-developed questionnaire. Dietary intake was assessed through 2-days 24-hour diet recall through interview. **Results:** A total of 85 subjects (55.3% male and 44.7 % female) with mean age 9.80 ± 4.74 years participated in this study. The frequency of children with normal weight was more than those with unhealthy weight with 56.5% of the subjects were within normal weight and 43.5% of them were among the unhealthy weight. Subjects consumed a mean of 1086 ± 321 kcal and 55.3% of the children achieved adequate energy intake while 44.7% of them received inadequate intake. No significant associations were found between sociodemographic factors, maternal knowledge, attitude and feeding practice with growth status. For medical history, no significant association was found except for the association between twin birth and growth status. A significant association was found between dietary intake with growth status (x^2=21.179, p-value <0.05). **Conclusion:** Healthcare providers and policy makers should be aware of this issue among children with cerebral palsy and proper action should be taken to improve nutritional status in order to prevent poor growth status among children with cerebral palsy.

ABSTRAK

Pengenalan: Kanak-kanak cerebral palsi mempunyai prevalensi tinggi berkaitan status pertumbuhanyang kurang sihat dan kekurangan zat makanan. Walaubagaimanapun, hanya sebilangan kecil kajian yang bertujuan untuk menentukan status pertumbuhan dengan pengetahuan, sikap dan cara memberi makan oleh ibu. Oleh itu, kajian keratan rentas ini bertujuan untuk mengetahui kaitan pengetahuan ibu, sikap, cara memberi makan, faktor sosiodemografi, sejarah perubatan dan pengambilan makanan seharian dengan status pertumbuhan di kalangan kanak-kanak cerebral palsi di Hospital Kuala Lumpur dan Hospital Rehabilitasi Cheras. **Kaedah:** Maklumat sosio-demografi diperolehi melalui soal selidik yang dikendalikan oleh subjek sendiri manakala maklumat antropometri dalam menentukan status pertumbuhan dilakukan oleh penyelidik. Pengetahuan dan sikap ibu dinilai melalui soal selidik Pengetahuan dan Sikap manakala amalan memberi makan oleh ibu dinilai oleh borang soal selidik yang disediakan sendiri. Pengambilan makanan dinilai melalui pengambilan makanan selama 2 hari 24 jam melalui temu ramah. Status pertumbuhan kanak- kanak diukur berdasarkan carta berat untuk umur **Hasil:** Sebanyak 85 subjek (55.3% lelaki dan 44.7% wanita) dengan usia rata-rata 9.80 ± 4.74 mengambil bahagian dalam kajian ini. Bilangan kanak-kanak dengan berat badan normal lebih banyak daripada mereka yang mempunyai berat badan tidak sihat dengan 56.5% subjek berada dalam berat normal dan 43.5% dari mereka adalah dalam kalangan berat badan yang tidak sihat. Subjek mengambil secara min 1086 ± 321 kcal dan 55.3% daripada kanak-kanak tersebut mencapai pengambilan tenaga yang mencukupi sementara 44.7% daripadanya tidak mendapat pengambilan makanan mencukupi. Tidak ada hubungan yang signifikan antara faktor sosiodemografi, pengetahuan ibu, sikap dan amalan makan dengan status pertumbuhan. Untuk sejarah perubatan, tidak ada hubungan yang signifikan kecuali hubungan antara kelahiran kembar dan status pertumbuhan. Terdapat hubungan yang signifikan antara pengambilan makanan dengan status pertumbuhan (x^2 =

21.179, nilai p <0.05). **Kesimpulan:** Penyedia penjagaan kesihatan harus menyedari masalah ini dalam kalangan kanak-kanak cerebral palsi dan tindakan yang sewajarnya harus diambil untuk meningkatkan status pemakanan dalam mencegah status pertumbuhan yang tidak sihat dalam kalangan anak-anak dengan cerebral palsi.

CHAPTER 1: INTRODUCTION

1.1 Background

Cerebral palsy (CP) is the commonest cause of childhood physical disability. CP is a neurodevelopmental disorder in which it is characterized by abnormalities of muscle tone, movement and motor skills, and related to the distorted cognitive development (Gulati & Sondhi, 2018). CP describes group of disorders of movement and or posture which are persistent but not necessarily unchanging as a result of a defect or lesion that is not progressive in nature affecting the immature or growing brain, so it is pathologically and etiologically heterogeneous condition.

CP children are normally related to physical disabilities and there are specific classifications of the impairments. Based on estimation, about 80% of CP patients present with movement disorder. Another way to classify CP is by categorizing it into GMFCS level. There are five GMFCS from level I to V. For the first level, the child can still perform gross motor skills but some coordination is limited. For Level II, children have minimal ability to perform gross motor skills. Next, for Level III, children require hand-held mobility devices in order to move around. For level IV, children need physical assistance in most settings. From the most severe level which is Level V, children are transported in a manual wheelchair in all settings.

Based on a study by Boyle et al,, (2011). it is found that the prevalence of children with developmental disabilities has increased over the last decade. Studies have documented that growth patterns for patients with CP are different from those in the general population. (Day et al., 2007). Malaysia has the highest prevalence of cerebral palsy children who are underweight which is 78% of the subjects were below 5^{th} percentile (Zainah et al, 2001). The study also found that a large population of Malaysian children with CP have poor nutritional status and linear growth. There are several factors that contribute to the growth

status of a CP child that include sociodemography, medical history, dietary intake, knowledge, attitude and feeding practice.

Previous studies have suggested that sociodemography affects the growth status of CP patient. The sociodemographic factors include occupation of parents which is related to the income of the parents. Income from the parents will determine the availability of necessities in the family such as food required for the children especially the CP child. Besides, some studies showed greater growth retardation progressing with age among children with severe CP (Aggarwal, Chadha, & Pathak, 2015).

Another factor associated with growth status among CP children is medical history. The component under medical history includes GMFCS level. There is a strong relation between GMFCS level and growth status of the patients with CP. This is because eating ability is significantly associated with gross motor functional ability as rated on GMFCS in young children with CP with the age ranging from 1 year 6 months to 3 years corrected age (Weir et al., 2013). Besides, Mild stunting and moderate/severe stunting increased significantly with level of gross motor function (Herrera-Anaya et al.,2016).

Furthermore, dietary intake is also included as a factor to affect the growth status of children with CP. Poor nutritional status is common among CP population especially inadequate intake due to the conditions. Inadequate dietary intake is one of the major contributors to poor nutritional status and altered growth in neurological impairment children (Penagini et al., 2015). Inadequate intake may have provide worse effects on the child especially when he or she is lack of Vitamin D (Kilpinen-Loisa et al., 2009).

Another factor which is closely related to growth status of CP patients is knowledge and attitude. Lack of knowledge from the parents about nutrition and healthcare of the children will affect their growth status. Besides, attitude involves the behaviour of the parents in taking care of their children. In this study, behavior of the parents towards the children is also assessed as it is significant for the study. Many a time, lack of knowledge and negative attitude of the caregivers may lead to faulty practices and may not show any progress in life of children with CP (Gracy, 2014).

Previous studies stated that feeding practice is closely associated with growth status of cerebral palsy patients. Based on studies from (Rogers, 2004). feeding methods are important factor in the general health of children from moderate to severe cerebral palsy. Cerebral palsy patients normally have their specific way to be fed due to the disabilities and their physical impairments. As example based on a study from (Bell & Samson-Fang, 2013), where they discussed about the special method for cerebral palsy patients in which they have their own customized seating to keep their body and head stable to ensure them to swallow easily.

1.2 Problem Statement

CP is a serious issue especially regarding to the nutrition of the CP population. Several studies suggest the rising incidence of common childhood disabilities over the past years (Wijesinghe, Cunningham, Fonseka, Hewage, & Østbye, 2015) The characteristics of a CP child differs with a normal one in terms of physical and cognitive ability. Besides, diet pattern and intake of the child will be affected and this also affect the growth status which leads to various conditions. Feeding a CP child requires a great effort from caregiver and also the child due to the nutritional problems exist within the population (Verrall, Berenbaum, Chad, Nanson, & Zello, 2000) The children with CP with greater risk of developing nutritional problem are those who present with

poor weight gain at young age, have significant motor impairments and feeding problems (Rempel, 2015).

Poor growth and malnutrition are frequently reported in children with CP in developed countries, but there is limited information from developing countries (Kakooza-Mwesige, Tumwine, Eliasson, Namusoke, & Forssberg, 2015) in Malaysia, children with CP are generally assumed to have poor growth, which may not be a true impression as most of the observations are conducted in hospitals where patients attend to severely affected (Zainah, Ong, Sofiah, Poh, & Hussain, 2001). The study on the growth status of children with CP are very limited in Malaysia. Most of the studies in Malaysia discuss on disabled children in general and growth status of CP is not included. Nevertheless, there are many studies regarding growth status of CP patients worldwide. One of the studies discuss about the adverse consequences of feeding problems which are poor nutritional status and impaired growth (Dahlseng et al., 2012).

Studies about feeding practice of caregivers or mothers of CP children are also limited in Malaysia. Mothers of CP children require specific way of feeding their child as they are present with impaired oral-motor function. The impairments will potentially affect the ability of children with CP to eat, drink and self-feed and it gives negative impact on their ability to safely ingest adequate nutrition and maintain adequate hydration (Weir et al., 2013). Therefore, feeding practice of the mothers is an issue that can give a strong influence on the nutritional status of the child and affecting the growth status.

1.3 Research Question

What are the associations of growth status with sociodemography, medical history, dietary intake, knowledge, attitude and feeding practice among CP children?

1.4 Significance of Study

The outcomes of the study will add to the knowledge on the factors associated with growth status among the CP population specifically among cerebral palsy children in Malaysia. The findings of the study will be used as reference for parents or health professionals which include dietitians to improve nutritional status of the CP patients. These findings also will aid the dietitians in planning the nutritional studies for the CP patients. Effective nutritional studies will be very useful in improving the health status of CP patients. The study will also study the maternal knowledge, attitude and feeding practice in depth and how it affects the growth status of children with CP. Studies related to the factors above can be conducted for other researchers in obtaining more findings in the future.

1.5 Hypotheses

Alternative hypothesis:

There are significant associations between growth status with sociodemography, medical history, dietary intake, knowledge, attitude and feeding practice among cerebral palsy children in Hospital Kuala Lumpur and Hospital Rehabilitasi Cheras.

1.6 Objectives

1.6.1 General Objectives:

To determine the associations of growth status with sociodemography, medical history, dietary intake, knowledge, attitude and feeding practice among cerebral palsy children in Hospital Kuala Lumpur and Hospital Rehabilitasi Cheras.

1.6.2 Specific Objectives:

1. To describe sociodemography, medical history, dietary intake, knowledge, attitude and feeding practice among subjects.
2. To determine the associations between growth status with sociodemography, medical history, dietary intake, knowledge, attitude and feeding practice of caregivers.

1.7 Conceptual Framework

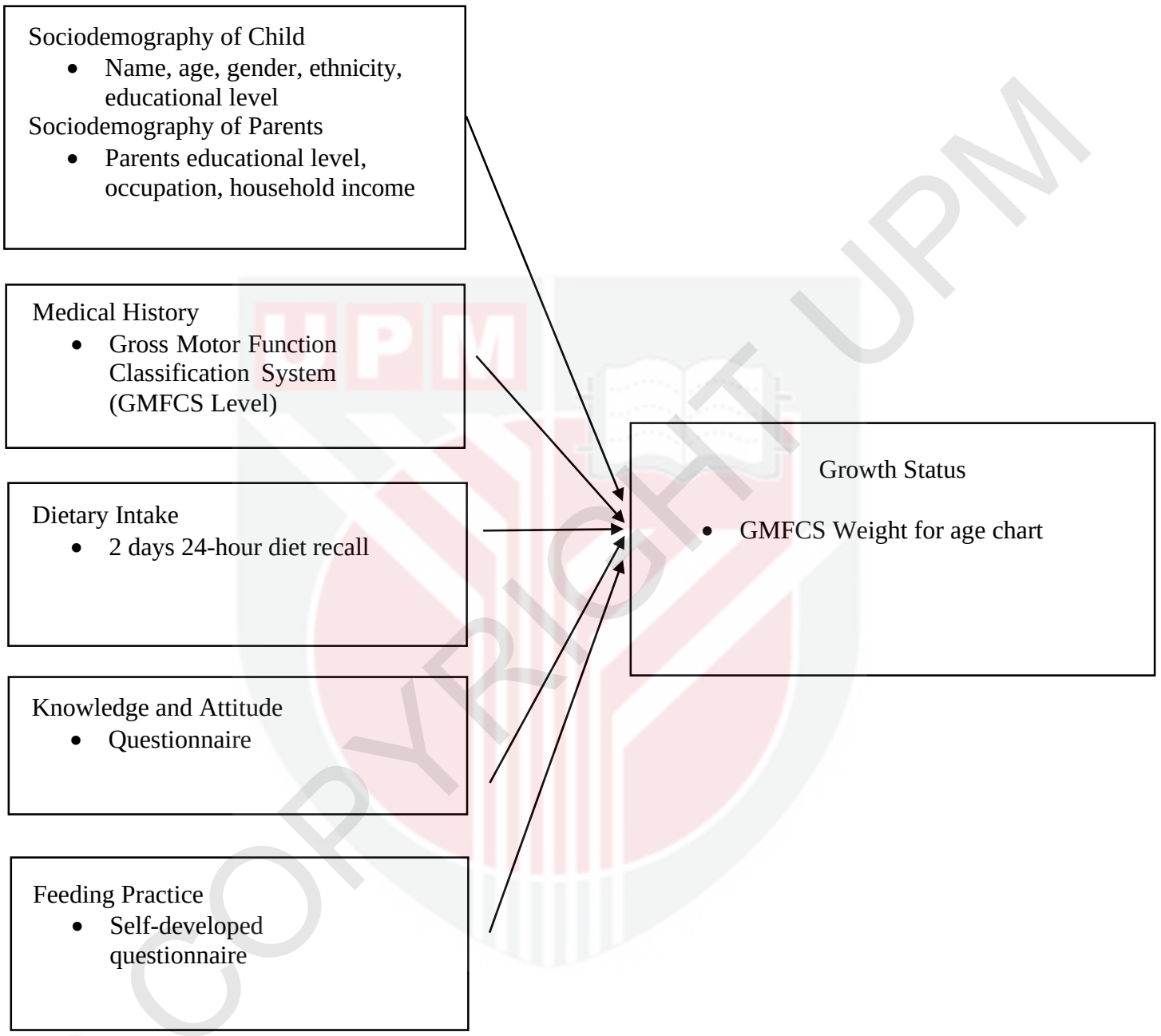

Figure 1: Conceptual Framework

CHAPTER 2: LITERATURE REVIEW

2.1 Growth Status

There are several articles that discuss about basic of CP. Some articles also include the epidemiology of cerebral palsy and some stated that the number of CP patients are increasing over time (Wijesinghe, Cunningham, Fonseka, Hewage, & Østbye, 2015). It is also stated that the overall global prevalence of CP is estimated to be 2 per 1000 live births (Gulati & Sondhi, 2018). Malnutrition and growth restriction are common among cerebral palsy children due to their impaired characteristics such as impaired oral-motor function, gastroesophageal reflux, aspiration and pneumonia, negative neurotropic effects as well as endocrine abnormalities (Herrera-Anaya, Angarita-Fonseca, Herrera-Galindo, Martínez-Marín, & Rodríguez-Bayona, 2016). According to past studies, approximately 40% of severe neurologically impaired are malnourished and the rate is even above 90% stated in some of the published studies.

Growth status among CP children has been a major issue throughout the years. The growth status of a CP child is a concern other than their physical impairments. A study from Kuperminc & Stevenson in 2008 stated that although the primary impairment in CP is in motor function, growth and nutrition disorders are common. There are differences in term of the growth status among children with CP depending on the severity of the impairment. Wang et al (2016) conducted a study where the study aims to describe the growth and nutritional status of CP children whose age ranging from 2 to 18 years old. The study found that the growth differences are present in almost all CP children but high tendency is found among the severe groups.

Besides, several studies discussed about the prevalence of underweight among children with CP. And it is found that Malaysia has the highest prevalence CP children who are underweight which is 78% of the subjects were below 5th percentile (Zainah

et al, 2001). This study was conducted to compare the linear growth and nutritional status of a group of Malaysian CP children with normal controls and also to determine if there are any factors that might lead to poor growth in children with cerebral palsy. The study also concluded that majority of Malaysian children with cerebral palsy have poor nutritional status and linear growth. Growth charts are standard tools in monitoring the growth, development and overall health of the children. The charts contain weight-for-age percentiles based on reference population. Children with weights below the 20^{th} percentile are normally associated with major medical conditions compared to those with normal weights (Brooks et al., 2011). Studies have documented that the growth patterns for CP patients are different from those in the general population (Day et al., 2007).

2.2 Factors associated with growth status of CP

2.2.1 Sociodemographic characteristics

Sociodemographic characteristic that include age, sex, ethnicity, parental education level and occupation are associated with the growth status of the children with cerebral palsy. Besides, children with cerebral palsy have different education level or approach compared to normal children. The education status of the children is also a concern in which it can contribute to their independency in daily activities without needing parents' assistance.

A study conducted by Morgan & Tan (2011) on rehabilitation of children with cerebral palsy in rural Cambodia about parental perception of family centered practices showed that most parents with cerebral palsy children prefer family-centered practices in rehabilitation of their children. The most related factor with growth status is occupation of the parents which has strong influence on the food intake of the CP children.

Age of the child also affects the severity of cerebral palsy. Some studies showed greater growth retardation progressing with age among children with severe cerebral palsy. In contrast to this, other study stated that children with 6 years old or lower had greater growth deficiency to be compared with older children. The reason being might be due to better nutritional status, higher levels of body fat and oral motor functioning has been improved over time.(Aggarwal, Chadha, & Pathak, 2015). Lower socioeconomic status may also be a risk factor for the prevalence of cerebral palsy (Agarwal & Verma, 2012). Poor food choices and health care due to restrained resource are the consequences of lower socioeconomic status.

Ochiai et al. (2012) conducted a study regarding the number of siblings and weight status of the child. In the study, it is found that number of siblings is one of the most important variables which is associated with childhood obesity. Another reason is due to amount of food received per one child. It is stated in this study that the amount of food for each child in large families is smaller than in small families. Furthermore, it is found that only children obtained

significantly higher intakes of many nutrients than children with siblings.

2.2.2 Medical history

Different level of GMFCS has different characteristic and capability. Meaning that children at every level have their own abilities on eating which affects their diet pattern. Growth patterns in children with cerebral palsy vary with motor and feeding abilities. The most common classification system of gross motor function is the 5-level GMFCS which is I – can walk without limitation, II- walks with limitation, III- walks using hand-held mobility device, IV- self-mobility with limitations and may use powered mobility and V- the child must be transported by others on a manual wheelchair (Brooks et al., 2011). Reported attainment of eating ability was significantly associated with gross motor functional ability as rated on the GMFCS in young children with CP between 1 year 6 months and 3 years corrected age (Weir et al., 2013). Moreover, some of the studies also discussed about the prevalence of stunting among cerebral palsy children with different GMFCS level. A study from Herrera-Anaya et al in 2016 found that mild stunting and moderate or severe stunting increased significantly with level of gross motor function.

Information regarding the delivery method and complications related to children with cerebral palsy are also important. O'Callaghan & Maclennan (2013) conducted a study about ceasarean delivery and cerebral palsy. In the study, it was found that emergency ceasarean delivery was associated with an increased risk of cerebral palsy. The study also concluded that the emergency ceasarean is not supported in preventing cerebral palsy among children.

One of the complications among cerebral palsy children in epilepsy. Epilepsy is very common among cerebral palsy children and normally it is considered as a marker of cerebral palsy severity. A study found that epilepsy was more frequent in children with a dyskinetic or bilateral spastic type along with other related impairments (Sellier et al., 2012).

2.2.3 Dietary Intake

Neurologically impaired children are at risk of malnutrition due to several nutritional and non-nutritional factors. The nutritional factors include insufficient dietary intake due to feeding difficulties as one of the issues. Inadequate dietary intake is one of the major contributors to poor nutritional status and altered growth in neurological impairment children (Penagini et al., 2015).

The nutritional requirement for cerebral palsy children is different with normal population. Possible factors of the difference include the decreased basal metabolic rate but the largely because of reduction in term of the activity level (Stallings, Charney, Davies, & Cronk, 1993). The differences of energy requirement between cerebral palsy children and normal children increase with the increasing severity of gross motor function (Bell & Samson-Fang, 2013). There are several methods on estimating the calorie needs of CP children. Some studies use the equation of neurologically impaired children in determining the calorie needs. There are also studies that compare the differences between those equations to see the reliability of the estimation (Hogan, 2004).

Culley & Middleton (1969) found and equation in determining the estimated energy requirement of cerebral palsy children. The formula includes motor dysfunction of the children as consideration in estimating the energy needs. Different formula is used for each category which includes without motor dysfunction, mild to moderate motor dysfunction and severe motor dysfunction. The formula is then reviewed by more recent studies and it is shown that the formula is used among European population and not suitable to be used for Asian children.

The method used in the study in assessing the dietary intake is by 24-hour diet recall. 24-hour diet recall is a short term method which allows greater specificity for describing foods and food preparation methods and flexibility for data analysis (Zainah et al., 2001). Dietary intake of cerebral palsy children from the normal children. Children with cerebral palsy has wide variability in food intake which related to their severe impaired growth and malnutrition (Caramico-Favero, Guedes, & de MORAIS, 2018).

Arslan & Ilgaz (2018) conducted a study regarding growth, dietary intake and feeding behaviour on children with cerebral palsy and it was found that the energy intake of the study group was lower and they consumed more water from foods, milk and fruit juices than their typically developing peers. The study also showed that children with cerebral palsy which the diet is mostly composed of liquidized and purified food are unable to meet their energy their energy or nutrient because of the lower energy density from these foods resulting to decreased calorie intake.

By using 24-hour diet recall, the calorie intake of cerebral palsy also can be monitored. The calorie intake of this group is potentially different from normal children which requires them to introduced to enteral nutrition to meet their calorie needs. Many commercial enteral feeds are available which include polymeric, semi-elemental and elemental formulas focusing on different age groups. The energy density, fibre content, macronutrient and micronutrient composition, osmolarity and as well as packaging are varied between those types. The choice of enteral feeds is depending on the energy requirement of the child (Kuperminc & Stevenson, 2008)

Schofield (1985) conducted a meta-analysis studies on determining basal metabolic rate, and developed a set of prediction equations that can be used. The formula has the lowest energy prediction error of available formulas. The formula also includes the activity level and

also stress factors in the calculation which makes it suitable to be used for cerebral palsy children.

2.2.4 Knowledge and attitude of nutrition

Parents of disabled children and also those who did not have a disabled child tended to have a narrow understanding of disability generally based on the basis of limited engagement with people with disabilities (UNICEF, 2017) Knowledge and attitude includes knowledge of parents in cerebral palsy and also the behavior of the parents towards their children with cerebral palsy.

General knowledge about cerebral palsy among parents will provide better outcomes on the growth status of their children with cerebral palsy. Knowledge about children's abilities on food texture will provide better understanding of eating nature of CP children with different GMFCS level (Weir et al., 2013). Knowledge of daily function aids the caregivers to plan to improve performance function of children with cerebral palsy (Tseng, Chen, Shieh, Lu, & Huang, 2011) Besides, knowledge regarding energy requirement of younger children with cerebral palsy is important as early nutritional management is vital to ensure optimum development especially among cerebral palsy group with well documented growth concerns (Walker, Bell, Boyd, & Davies, 2012). Oral feeding requires undivided attention so the knowledge developed between the mother and the child is vital during the process. Expert advice is required for oral feeding which can be improved during infancy and early childhood. Consistency of care is crucial and it will influence the mother to be more understanding about the child (Sleigh, 2005).

Behavior includes the stress of parents in having cerebral palsy children. Handling disabled children is different and it affects the parents or the caregivers mentally. It is vital to assess the mental health of the parents to measure how the children with cerebral palsy has affected it in any way. Parents of cerebral palsy children normally has higher levels of stress than normal population children (Ketelaar, Volman, Gorter, & Vermeer, 2008). A study conducted by Olawale, Deih, & Yaadar (2013) stated that cerebral palsy children are reported

to contribute to psychological problems and it also adds to the burden of care. Child's dependence in daily activities also lead to psychological distress in mothers and the issue is more serious among mothers with more dependent child. However, in it included in the conclusion of the study in which families caring for a child with cerebral palsy normally have positive attitude towards their children.

A study conducted by Huang, Kellett, & St John (2010) on experiences of mothers after learning their child's disability has demonstrated several findings related to the behavior of the mothers. All the subjects which are the mothers in this study exhibited hopelessness and negative emotions after finding out that their child is disabled. Besides, the findings of the study also revealed that a diagnosis of cerebral palsy has affected not only the mothers but also other family members. The study concluded that better knowledge about cerebral palsy may influence the acceptance of the child among the other family members, and might enable them to help the mother.

2.2.5 Feeding Practice

Feeding practice is also associated with the growth status of the children with cerebral palsy. Generally, children with cerebral palsy have difficulties during feeding time due to the physical disabilities. Specific method is required in feeding them in order to ensure their nutrition level which affects the growth status. One of the way to overcome the linear growth among cerebral palsy children is by providing them enteral feedings and it was found that when enteral feedings are initiated in early life, weight and growth outcomes are improved (Rogers, 2004). Even a small deficit in feeding skill can provide a significant impact on the quantity of food consumed in this group of children (Rempel, 2015) Cerebral palsy patients normally have their specific way to be fed due to the disabilities and their physical impairments.

Marques & Sá (2016) conducted a study in identifying the caregivers' difficulties in feeding their child. In the study, it is found that the most common difficulties stated by the parents were food spilling, choking and vomiting. Cerebral palsy children are also known to have chewing and swallowing problems which heavily affects their feeding time. Meals have to be prepared separately as they are needed to prepare different food for their CP children. The parents also admitted that the extended amount spent feeding their CP child affects their routines and quality of life.

Feeding a cerebral palsy child may require great effort from the caregiver and child due to the nutritional problems that exist within the population. Parents have the major influential role in their children's eating pattern especially for cerebral palsy population. Feeding practice is closely related with the food choices of the parents in feeding their cerebral palsy child. Some parents have confusion about healthy food in which they are aware that their children should eat fruit and vegetables but there are lack of awareness on which food are high in salt (Lovelace & Rabiee-Khan, 2015).

To measure the style of feeding of parents may be more predictive of weight status of the child due to the particular impact of feeding on the eating behavior of the child. Some parents may be very restrictive about the choice of food for their cerebral palsy patients because of personal beliefs that certain kind of food may worsen the condition of the child. Restrictive feeding practices is associated with lower child weight status in the presence of specific feeding style (Hennessy, Hughes, Goldberg, Hyatt, & Economos, 2010). Feeding environment does impact the successfulness of feeding the child. The caregivers should use child's preferred method of communication during mealtimes so that will help the child to indicate choices, readiness for feeding, satiety or discomfort with feeding. (Andrew, Parr, & Sullivan, 2012).

A study conducted by Arslan & Ilgaz (2018) compared the difference in term of type of food of CP children who consumed only liquidized and pureed textures and typically developing children. Due to the difficulty of biting and chewing food among cerebral palsy children, their diet is limited to liquidized and pureed food. Challenges are faced by the caregivers in preparing the meal as special preparation is required and they may fail to meet the correct consistency which can result to choking or vomiting during mealtime.

CHAPTER 3: METHODOLOGY

3.1 Study Design

This is a cross-sectional hospital based study to determine the associations between growth status and sociodemography, medical history, dietary intake, knowledge, attitude and feeding practice among cerebral palsy children in Hospital Kuala Lumpur and Hospital Rehabilitasi Cheras.

3.2 Study Location

The study was carried out at two different locations which are Hospital Kuala Lumpur and Hospital Rehabilitasi Cheras which are located in Federal Territory of Kuala Lumpur.

3.3 Sample Size Determination

Sample size for this study is calculated using the formula:

$C = 0.5*\ln[(1+r)/(1-r)]$

$N = [(Z\alpha + Z\beta)/C]^2 + 3$

(Hulley, Cummings, Browner, Grady & Newman, 2013)

Where;

$\alpha = Z\alpha = 1.96$

$\beta = Z\beta = 0.84$

r = the expected correlation coefficient

Table 3.1: Sample Size Calculation

Correlation studies	**Correlation, r**	**Sample size, n**
Age and Nutritional Status (Wang et al., 2016)	r = -0.306	$C = 0.5*\ln[(1+r)/(1-r)]$ $C = 0.32$

		$N = [(Z\alpha + Z\beta)/C]^2 + 3$ N = 79
GMFCS Level and Weight z-score (Wang et al., 2016)	r = -0.304	C = 0.5*ln[(1+r)/(1-r)] C = 0.31 $N = [(Z\alpha + Z\beta)/C]^2 + 3$ N = 84

Based on the calculation using the formula, the highest value is taken as the sample size for the study. Additional 10% was added to estimated sample size to account for dropout rate or any other errors. Thus, the estimated sample size was 92.

3.4 Subjects

Table 3.2: Inclusion and Exclusion Criteria

Inclusion Criteria	**Exclusion Criteria**
Children who fulfil the criteria for definition of CP according to Gross Motor Classification System (GMFCS)	A child with blindness, deafness.
Children with CP aged 2 to 18	A child whose parents refuse to participate in the study.

3.5 Sampling Method

The sampling method used in the study was purposive sampling. A list of cerebral palsy patients with appointment was obtained from paediatrics Outpatient Clinic at Hospital Kuala Lumpur and Hospital Rehabilitasi Cheras. Next, subjects were recruited based on inclusion and exclusion criteria. All subjects were invited to participate in the study.

3.6 Study Measures

An interview-administered questionnaire was used in this study to obtain the knowledge, attitude and feeding practice as well as the sociodemographic factors (Appendix B). The same method was used to obtain the anthropometry measurements of the children with cerebral palsy.

3.6.1 Anthropometry Data

i. Weight

The body weight of the subjects was measured using the TANITA Digital Weighing Scale (TANITA Corporation, USA) Before measurements are taken, calibration the scale must be at zero. Whenever possible, the weight was taken on a digital scale. Next, the subject should be weighed without shoes and only light clothing must be worn. The subject must stand still with the weight equally distributed on both feet. Besides, the child must not hold onto to anything for support. Average 3 readings were taken and measurements were read to the nearest 0.1kg. For non-ambulatory patients, the subject was weighed with the parent and then the amount was subtracted from the parent's weight to obtain the child/s estimated weight (Town, Paediatric, & Group, 2009). For the children who were unable to stand, the wheelchair scale was used and proceeding by weight subtraction (Bell & Samson-Fang, 2013)

ii. Height

Recumbent length was taken for 2 years and older who were unable to stand. Segmental length was taken for children with the inability to stand in estimating the height. Knee height (KN) was a reliable alternative in estimating the height among non-ambulatory CP children.

3.6.2 Growth Chart

The growth status of the children was assessed using the weight-for-age chart for cerebral palsy children (Brooks et al., 2011). Weight-for-age chart for cerebral palsy children varies with age, gender and GMFCS level. For GMFCS level V, the charts are separated into two either for orally fed or tube fed children. The interpretation of the growth chart was different between GMFCS I-II and GMFCS III-V. The cut off point for mild to moderate severity (GMFCS I and II) was children with below 5th percentile was classified as children with unhealthy weight. For GMFCS III-V, those who were below 20th percentile was included as unhealthy weight. The different in the cut-off point is due to the condition of the children as children with mild-moderate severity are almost similar to normal children. These growth charts will provide visual indication if potentially unhealthy weights which then will assist to monitor their child's growth (Brooks et al., 2011).

3.6.3 Self-Administered Sociodemographic Characteristics

Self-administered questionnaire was used to determine the sociodemographic characteristics. There are two sections which include the sociodemographic characteristics of the child and the caregivers. The items assessed for the child's sociodemography were age, number of siblings, race, sex of the child, and the educational status. For the caregivers, the items included were educational as well as occupational status and income.

3.6.4 Medical History

Medical history was included in the self-administered questionnaire. The Gross Motor Function Classification System (GMFCS) of the subject was assessed in the questionnaire and completed by the parent. Other items in the questionnaire under medical history include delivery method, twin birth, premature birth and also complications related to cerebral palsy of the child. Following that, GMFCS Level were categorized according to the severity. GMFCS

Class I until II were classified as “Mild to Moderate” and GMFCS III to V were classified as “Severe”. The delivery method assessed was either it is normal delivery, caesarian section or vacuum assisted vaginal delivery. For complications, multiple choices answers were provided which included complications during birth, severe fever or seizure and no complications. The mother was required to tick “Yes’ or “No” for twin or premature birth questions accordingly.

3.6.4 Dietary Intake

24-hour diet recall was done with parents in determining the energy intake of the children. The diet recall was recorded in one of the sections of the interview-administered questionnaire. The 24hr diet recall is completely open-ended survey and able to collect a variety of detailed information about food consumed over specific period of time.

The 24hr diet recall was conducted in an interview manner where detailed data about food preparation methods, ingredients used in mixed dishes and the brand name of commercial products were assessed. The total daily energy intake was derived from diet analysis using Nutritionist Pro Software which includes reference from the Nutrient Composition of Malaysian Food.

Dietary intake of the subjects was obtained through two days 24-hour diet recall with the subjects. The 24-hour diet recall was taken for one day for weekdays and one day for weekend. 3-days diet recall were not achievable due to the condition of majority of the cerebral palsy children which could influence the interview with their mothers. The average energy intake was obtained from the 2-day diet recall. The food ingredients, preparation methods an amount of food and beverages being consumed were listed out. The amount of the foods and beverages were expressed in terms of household measurement, for instance, cup, glass, tablespoon, teaspoon, slice and so on. Nutritionist Pro diet research program has been used to measure the energy intake. Database of Malaysia Food Composition was used to assist in the study of food if the product was not available on the program. The estimated energy

requirement of the children was calculated using the Schofield's equation

which was based on the age, gender, severity level, activity level and stress factor. The calculated estimated energy requirement was then compared with the children's energy intake based on 24-hr diet recall. Children who failed to obtain 80% of the estimated energy intake was categorised as 'inadequate intake' and those who achieved 80% of estimated energy intake was categorised as 'adequate intake' (Kilpinen-Loisa et al., 2009)

Table 3.3: Schofield's Equation

Age	Gender	Equation
0-3 years old	Male	0.17W + 15.17H – 617.6
	Female	16.25W + 10.23H – 413.5
3-10 years old	Male	19.6W + 1.303H + 414.9
	Female	16.97W + 1.618H + 371.2
10-18 years old	Male	15.25W + 1.372H + 515.5
	Female	8.365W + 4.65H + 200.0

**W= Weight H= Height*

3.6.5 Knowledge and Attitude

A questionnaire by Gracy (2014) was used in the study. The questionnaire was used in the study of Knowledge, Attitude and Practice of Caregivers of Children with Cerebral Palsy in 2014. The practice section of the questionnaire is removed as it focuses on general practice instead of feeding practice. Initially, 12 questions were adapted from the questionnaire which were 7 questions from knowledge part (Q1, 2, 5, 6, 12, 21, 28) and 5 questions from attitude part (Q1, 13, 7, 22, 24). The questions were translated into Malay to be included in the questionnaire. Some questions of the attitude part were modified. Cronbach alpha test was run to test the internal consistency of the questions and some item were deleted. Five items were finalised which included two questions from Knowledge part and three questions from Attitude with the Cronbach alpha value of 0.610. For knowledge questions, one mark would be given for the right answer and zero for wrongly answered questions. For attitude part, 5-point likert

scale was used and maximum score to be obtained was 15 marks for three questions. The maximum score to be obtained from knowledge and attitude part was 17 marks.

The scoring system is based on the classification of level of knowledge and attitude which includes “Favourable knowledge and attitude” and “Unfavourable knowledge and attitude”. The categorisation between favourable and unfavourable maternal knowledge and attitude was determined using the mean score. Mothers with lower than the mean score were classified into unfavourable maternal knowledge and attitude while those who scored higher than the mean score were categorized as favourable maternal knowledge and attitude

The scoring key for each item:

Table 3.4: Scoring for likert-scale maternal attitude and feeding practice

SA (strongly agree)	5
A (agree)	4
N (neutral)	3
D (disagree)	2
SD (strongly disagree)	1

mark for all positive questions & vice versa

3.6.6 Feeding Practice

Maternal feeding practice was assessed using self-developed questionnaire specifically for determining the feeding practice of mothers with cerebral palsy children. The questions consisted of 13 questions with reference of multiple previous studies of knowledge, attitude and feeding and also CPCHILD questionnaire from a previous study (Rehab, 2012). The items were then validated by several dietitians and reliability test was also run to test the internal consistency. After analysing the internal consistency of the questions, the Cronbach alpha value that was obtained was 0.753 The questions consisted of 12 positive questions and 1 negative

statement question. Scoring key was given for each item with SA (strongly agree) = 5 Mark, A (agree) = 4 mark, N (neutral) = 3 mark, D (disagree) = 2 mark and SD (strongly disagree) = 1 mark for all positive questions and vice versa for negative question. The maximum possible mark to be obtained was 65. The categorisation between poor and good maternal feeding practice was determined using the mean score, those who scored lower than the mean score was categorised as poor maternal feeding practice and good feeding practice for those who achieved more than the mean score.

3.7 Procedure

Permission to conduct this study was obtained from the Ministry of Health National Medical Research Registry & Medical Research and Ethics Committee (MREC) (Appendix A) The consent approval from National Medical Research Registry (NMRR), Hospital Kuala Lumpur and Hospital Rehabilitasi Cheras. Data collection was conducted until March 2020. Informed consent was obtained prior the data collection to the caregivers. The participants were recruited from paediatrics wards for the respective hospital. Next, writing consent was provided to obtain permission to conduct the study. Anthropometry data was then assessed by measuring the weight and height of the children. For bed-ridden children, segmental length was used to determine their height. Following by that, a questionnaire with several sections which consisted of sociodemographic data of the child and caregivers, medical history, maternal knowledge, attitude and feeding practice was distributed to the caregiver. After that, the researcher performed 24-hour diet recall with the mother through face-to-face interview to obtain the patient dietary intake.

3.8 Data Analysis

For data analysis, the IBMPSS Statistics 22 was used to analyse the statistics. The significance level was set at <0.05 prior the test and analysis of variables. Categorical variables were presented in percentage and frequencies. For continuous variables, the results were presented in mean and standard deviation. Chi-square test was executed to test the correlation between the categorical variables and the p-value of Fisher's Exact Test was used if the Chi-square was violated.

CHAPTER 4: RESULTS

Socio-Demographic Factors

The total number of subjects participated in this study were 85 subjects. All the subjects managed to complete the data required as shown in the methodology part. Table 4.1 shows the socio-demographic information of the subjects. The subjects of this study ranged from 2 to 18 years old. The mean age of the subjects was 9.80 ± 4.74 years old. 55.3% of the subjects were male and 44.7 % were female. In the context of ethnicity, the percentage of Malay subjects were 80.0% and 20% of the subjects were non-Malay. Besides, 29.4% of the children were single child and 70.6% had siblings. In term of the educational status, 23.5% of the children did not go to school and 76.5% of them were in school.

Moreover in Table 4.2, for parental educational level, 47.1% of them were non-tertiary level and 52.9% of the parents have achieved tertiary level in education. In the context of income, 72.9% of the parents obtained less than RM5000 monthly and only 27.1% of them earned more than RM5000 monthly. This means that majority of the parents in this study belonged to B40 group with less than RM5000 income per month. In term of the employment status, only 7.1% of them were unemployed and the rest were employed with 92.9%.

Table 4.1: Sociodemographic factors of children (n=85)

	n (%)
Ages	
2-10 Years Old	49 (57.6)
11-18 Years Old	36 (42.4)
No. of Siblings	
Only Child	25 (29.4)
With Siblings	60 (70.6)
Sex	
Male	47 (55.3)
Female	38 (44.7)
Race	
	68 (80.0)
	17 (20.0)

Malay	
Non Malay	
Education Status	
No School	20 (23.5)
School	65 (76.5)

Table 4.2: Sociodemographic factors of caregivers (n=85)

	n (%)
Level of Education	
Non-Tertiary Level	40(47.1)
Tertiary Level	45(52.9)
Employment Status	
Unemployed	6(7.1)
Employed	79(92.9)
Income	
<RM 5000	62(72.9)
>RM 5000	23(27.1)

Growth Status

Based on Table 4.3, the frequency of children with normal weight were more than those with unhealthy weight with 56.5% of the subjects were within normal weight and 43.5% of them were among the unhealthy weight based on the percentile. Majority of the children with unhealthy weight were those with GMFCS Level V with 62.4%.

Table 4.3: Growth Status of children (n=85)

Growth Status	n (%)
Normal Weight	48 (56.5)
Unhealthy Weight	37 (43.5)

GMFCS Level	Normal Weight n(%)	Unhealthy Weight n(%)	Total n(%)
I	3	2	5 (5.9)
II	7	0	7 (8.2)
III	5	3	8 (9.4)
IV	7	5	12 (14.1)
V	26	27	53 (62.4)

Dietary Intake

The individual energy requirement of subjects was calculated based on Schofield formula. The individual requirement was compared to their mean dietary intake based on 2-day diet recall. Based on Table 4.4, the mean ± standard deviation of energy intake was 1086 ± 321 kcal. Moreover, 55.3% of the children achieved adequate energy intake while 44.7% of them received inadequate intake based on 2-day 24-hour diet recall.

Table 4.4: Dietary intake of the subjects (n=85)

	Mean ± SD	n (%)
Dietary Intake (kcal)	**1086 ± 321**	
Adequate Intake		47(55.3)
Inadequate Intake		38(44.7)

Medical History

Based on Table 4.5, for GMFCS severity, 23.5% of the subjects were mild to moderate and 76.5% of them were in severe category. Based on GMFCS Level, 5.9% were GMFCS Level I, 8.2% of them were GMFCS Level II, 9.4% were GMFCS Level III, 14.1% were GMFCS Level IV and 62.4% of the subjects were from GMFCS Level V. Among 85 subjects in this study, only 8.2% of them had twins. Majority of the children were born full term (60.0%) and 40% of them were born premature. Besides, 50.6% the delivery method of the children was non-normal which included caesarean delivery and vaginal vacuum delivery while 49.4% of them with normal delivery method. For complications, 37.6% had complications during birth, 28.2% have severe fever or seizure and 34.1% of them had no complications.

Table 4.5: Medical history of the subjects (n=85)

	n (%)
GMFCS	
Mild to Moderate	20(23.5)
Severe	65(76.5)
Twin	
Twin	7(8.2)
Non-Twin	78 (91.8)
Premature	
Premature	34(40.0)
Full-term	51(60.0)
Birth Delivery	
Normal	42(49.4)
Non-normal	43(50.6)
Complications	
During Birth	32(37.6)
Severe fever and seizure	24(28.2)
No complications	29(34.1)

Maternal Knowledge and Attitude

For maternal knowledge and attitude, based on Table 4.6, the mean score is 15.75±1.792. The mothers were classified into two categories which were 'unfavourable knowledge and attitude' and 'favourable knowledge and attitude'. According to the score, majority of the mothers had favourable knowledge and attitude. The result was 81.2% of the mothers had 'favourable knowledge and attitude' and 18.8% were with 'unfavourable knowledge and attitude'.

Maternal Feeding Practice

Based on Table 4.6, the mean ± standard deviation of maternal feeding practice score of the mothers was 50.75±7.46. The percentage of mothers with good feeding practice was slightly higher than those with poor feeding practice with 58.8% and 41.2% respectively.

Table 4.6: Maternal knowledge, attitude and feeding practice (n=85)

	Mean ± SD	**n (%)**
Knowledge & Attitude	**15.75±1.792**	
Favorable		69(81.2)
Unfavorable		16(18.8)
Feeding Practice	**50.75±7.464**	
Good		50(58.8)
Poor		35(41.2)

Associations between socio-demographic factors, medical history, dietary intake, maternal knowledge, attitude and feeding practice with Growth Status

Based on Table 4.7, there are no significant association between socio-demographic factors of both, the child and the parent with growth status. Furthermore, no associations were found between medical history and growth status except for the twin birth (Table 4.8)

Table 4.7: Associations between sociodemographic characteristics and growth status (n=85)

	Normal Weight n(%)	**Unhealthy Weight n(%)**	x^2	***p*-value**
Ages			0.021	0.884
2-10 Years Old	28(57.1)	21(42.9)		
11-18 Years Old	20(55.6)	16(44.4)		
No. of Siblings			0.179	0.672
Only Child	15(60.0)	10(40.0)		
With Siblings	33(55.0)	27(45.0)		
Sex			0.460	0.498
Male	25(53.2)	22(46.8)		
Female	23(60.5)	15(39.5)		
Race			0.108	0.743
Malay	39(57.4)	29(42.6)		
Non-Malay	9(52.9)	8(47.1)		
Education Status			0.023	0.879
Not School	11(55.0)	9(45.0)		
Schooling	37(56.9)	28(43.1)		

Table 4.8: Associations between medical history and growth status (n=85)

	Normal Weight n(%)	Unhealthy Weight n(%)	x^2	*p*-value
GMFCS			3.653	0.056
Mild to Moderate	15(75.0)	5(25.0)		
Severe	33(50.8)	32(49.2)		
Twin			5.522	0.040*
Twin	47(60.3)	31(39.7)		
Non-twin	1(14.3)	6(85.7)		
Premature			0.128	0.721
Premature	20(58.8)	14(41.2)		
Full-term	28(54.9)	23(45.1)		
Birth Delivery			0.015	0.902
Normal	24(57.1)	18(42.9)		
Non-normal	24(55.8)	19(44.2)		
Complications			0.621	0.733
During Birth	18(56.3)	14(43.8)		
Severe fever and seizure	15(62.5)	9(37.5)		
No Complications	15(51.7)	14(48.3)		

**Fisher's Exact Test*

Table 4.9: Associations between dietary intake and growth status (n=85)

	Normal Weight n(%)	Unhealthy Weight n(%)	x^2	*p*-value
Calorie Intake			21.179	0.000
Adequate Intake	37(78.7)	10(21.3)		
Inadequate Intake	11(28.9)	27(71.1)		

Table 4.10: Associations between maternal knowledge, attitude and feeding practice and growth status (n=85)

	Normal Weight n(%)	Unhealthy Weight n(%)	x^2	*p*-value
Maternal Feeding Practice			3.544	0.060
Good	24(48.0)	26(52.0)		
Poor	24(68.6)	11(31.4)		

	Normal Weight n(%)	Unhealthy Weight n(%)	x^2	*p*-value
Maternal Knowledge & Attitude			0.291	0.589
Favorable	38(55.1)	31(44.9)		
Unfavorable	10(62.5)	6(37.5)		

Table 4.11: Associations between parental sociodemographic characteristics and growth status (n=85)

	Normal Weight n(%)	Unhealthy Weight n(%)	x^2	*p*-value
Level of Education			2.236	0.135
Non-Tertiary Level	26(65.0)	14 (35.0)		
Tertiary Level	22(48.9)	23(51.1)		
Employment Status			1.406	0.396*
Unemployed	2(33.3)	4(66.7)		
Employed	46(58.2)	33(41.8)		
Income			0.237	0.627
<RM 5000	36(58.1)	26(41.9)		
>RM 5000	12(52.2)	11(47.8)		

**Fisher's Exact Test*

CHAPTER 5: DISCUSSION

Growth Status

In this study, majority of the subjects had normal weight. However, almost half of the subjects (43.5%) were included among those with unhealthy weights. This finding is consistent with a previous study which stated that the prevalence of underweight or undernutrition for cerebral palsy children were within the range of 22.2% and 78.2% (Safiza Mohamad Nor, Abdul Aziz, Siew Man, Ambak, & Azahadi Omar, 2015)

Sociodemographic Factors

In this cross-sectional study, the age group included in the study was between 2-18 years old. The range of age was similar to the range of ages of previous study related to children

with cerebral palsy (Gracy, 2014). In term of the number of siblings, only 29.4% of the subjects were the only child in the family. The number of siblings is related with the dietary intake of the children which leads to the difference in term of growth status as food received by a child from small size family is more than from larger size family (Ochiai et al., 2012). In term of the race, majority of the subjects included in the study were Malay. This could be due to the selected study locations in which majority of the subjects were from a certain race. Besides, for parental sociodemographic factors, almost half of the caregivers did not obtain education until tertiary level. The income of majority of the caregivers fell in the category below RM5000 per month. The reason being could be due to the lack of qualification as most of them only obtained education until the primary level. A small number of parents were unemployed in this study and majority of them are employed.

Dietary Intake

Looking at the dietary intake of the children, almost half of the subjects (44.7%) received inadequate dietary intake. Inadequate intake among cerebral palsy children could be due to nutritional problems which included choking, swallowing difficulties and drooling which could lead to dehydration (Dahlseng et al., 2012). Difference in terms of the severity of the gross function is also a contributing factor to the percentage of children with inadequate dietary intake as those with more severe levels are associated with worse conditions of nutritional problem and the dietary intake was greatly affected.

Medical History

Medical history included GMFCS level, twin birth, premature birth, delivery method and complications. According to the results, almost 80% of the children were from severe levels of GMFCS. Children with severe GMFCS levels were more likely to be associated with more severe dysphagia which led them to require certain restrictions in diet and more

dependent on others during feeding (Weir et al., 2013). This could be the potential reason why a large percentage of children with unhealthy weights were found in this study. Furthermore, children with severe GMFCS level are associated with impaired growth status as it decreased progressively as the levels of GMFCS increased according to previous study (Herrera-Anaya et al., 2016). In the context of the complications encountered by the child, some of them are associated with complications which included severe fever, seizure or epilepsy. Based on the past study, complication such as epilepsy is common among children with cerebral palsy as it affects between 15 to 60 percent of cerebral palsy children. In the present study, 40% of the subjects were born preterm. There are potential difference in some aspects for children who were born preterm as a study suggested that some of the causes of children who were born preterm may differ from those who were born at term (Tollån es, Wilcox, Lie, & Moster, 2014).

Maternal Knowledge, Attitude and Feeding Practice

Majority of the mothers had favorable knowledge and attitude. The reason being might be due to the questionnaire selected and most of the questions asked were related to basic knowledge about cerebral palsy. However, the percentage of mothers with good maternal feeding practice was not as high as their knowledge and attitude scores. This proves that, some mothers had positive knowledge and attitude but they were unable to implement a good feeding practice due to different circumstances related to their children. Children with different GMFCS levels require different feeding skills, as their conditions are different based on the levels of severity. Some mothers were unable to provide good feeding practice may be due to the limited time spent for their children. Past studies had shown that children with cerebral palsy required more time during feeding and most of the mothers admitted that the extended amount spent feeding their CP child affects their routines and quality of life (Marques & Sá, 2016).

Hypothesis Testing

The range of age was similar to the range of ages of previous study and the result was not consistent which stated that there is negative association between age and growth status of a cerebral palsy child (Wang et al., 2016). In term of the race, majority of the subjects included in the study were Malay and there was also no significant association between the race and growth status. Besides, no significant associations were found between sex and educational status with growth status of the child. Furthermore, the current study also found that no significant association between parental sociodemographic factors which included educational level, occupational status and income with growth status of the children

No significant association was found between medical history and growth status except for twin birth. A significant association was found between growth twin birth and the growth status of children. this is consistent with the previous study which stated that the growth status of twins were compromised at about the third trimester (Hall, 2003). The association between GMFCS Level and growth status was not significant with the *p-value* = 0.056. This finding was not aligned with a previous study which found significant relationships between the levels of gross motor function classification system with the growth status of the children which included malnutrition or even stunting (Herrera-Anaya et al., 2016).

The dietary intake was significantly associated with the growth status of the children in this study. This supports the previous studies on growth status and dietary intake of cerebral palsy children as some of the findings included cerebral palsy children were often related to inadequate food intake, anthropometric deficits as well as high number of gastrointestinal symptoms which lead to specific diet characteristics and impaired growth were highly prevalent among CP children due several factors which included diet (Caramico-Favero, Guedes, & de Morais, 2018). Inadequate intake among cerebral palsy children could be due to

nutritional problems which included choking, swallowing difficulties and drooling which could lead to dehydration (Dahlseng et al., 2012).

For maternal knowledge, attitude and feeding practice, no significant associations were found between them with growth status. This finding was inconsistent with previous studies which showed the association between feeding practice and growth status of the children. Inadequate growth and undernutrition are consequences of impaired feeding based on previous study (Andrew et al., 2012). Feeding issues were shown to influence the growth, nutrition and general health status of children with cerebral palsy.

In this study, it was shown that there are no significant associations between sociodemographic factors, maternal knowledge, attitude and feeding practice with the growth status. However, there was a significant association between dietary intake and growth status of the children. Furthermore, a significant association was also found between twin birth and growth status. Hence, most of the alternative hypothesis were rejected except for the association between dietary intake and growth status of the cerebral palsy children. For medical history, the hypothesis was rejected except for the association between twin birth and growth status.

CHAPTER 6: CONCLUSION

6.1 Conclusion

In conclusion, the percentage of subjects who were categorized into unhealthy weight based on the weight-for-age chart was 43.5%. Significant association was found between dietary intake of the children with the growth status. Nevertheless, no significant associations shown between sociodemographic characteristics of children and caregivers, medical history, maternal knowledge, attitude and feeding practice with the growth status of the children. No insignificant associations were found between medical history including the Gross Motor Function Classification System and growth status which contradicted with previous studies that highlighted growth status of children with cerebral palsy was associated with the severity of the gross functions. This study pointed out about the importance of maternal knowledge, attitude and feeding practice on the growth status of cerebral palsy children. However, some limitations found during the study were the potential cause of the insignificant findings found.

Other than that, it was found that the percentage of children with unhealthy weight are higher among those with severe GMFCS Level (III-V). This is due to the decreased physical ability and the children were associated with severe problems especially in term of feeding. The inability to feed by themselves and full rely on their caregivers' assistance is the cause of inadequate energy intake which lead to impaired growth status. Therefore, proper intervention program in teaching mothers of cerebral palsy patient in terms of knowledge, attitude and feeding practice should be planned in solving this problem. Last but not least, further studies about these findings are needed to create a better understanding about the factors associated with growth status among cerebral palsy children in Malaysia.

6.2 Strengths

The present study had provided new information to local study about maternal knowledge, attitude and feeding practice among caregivers of cerebral palsy children. more recent data regarding the growth status of the children was included in the study. The two days 24-hour diet-recall was also reliable in determining the dietary intake of the cerebral palsy children and how it influences the growth status. The 24-hour diet recall was conducted in an interview manner in detailed and reduced the bias of self-reported food record.

6.3 Limitations

There were several limitations found in the study. Firstly, the small sample size of the present study does not represent the whole population of cerebral palsy children. The questionnaire used in assessing the maternal knowledge, attitude and feeding practice was not suitable that some items had to be removed to obtain an acceptable Cronbach alpha value. Apart from that, the use of cross-sectional study cannot determine the causal effect of certain factors on the growth status.

6.4 Recommendations

First of all, further studies should include multiple study locations and larger sample size to generalize the findings of the growth status among the cerebral palsy children. Further intervention study should be conducted to determine the appropriate intervention in monitoring the growth status of cerebral palsy children.

Besides, more studies are needed regarding maternal knowledge, attitude and feeding practice among cerebral palsy children for references and further research. Multi-factorial study, intervention study or cohort study can be done to have more understanding on the associations of factors with growth status among cerebral palsy context. Healthcare providers

and policy makers should be aware of this issue among pediatric patients and proper action should be taken to improve nutritional status in order to prevent poor growth status among cerebral palsy children.

REFERENCES

a Study on the Knowledge Attitude and Practice of. (2014).

Agarwal, A., & Verma, I. (2012). Cerebral palsy in children: An overview. *Journal of Clinical Orthopaedics and Trauma*, *3*(2), 77–81. https://doi.org/10.1016/j.jcot.2012.09.001

Andrew, M. J., Parr, J. R., & Sullivan, P. B. (2012). Feeding difficulties in children with cerebral palsy. *Archives of Disease in Childhood: Education and Practice Edition*, *97*(6), 222–229. https://doi.org/10.1136/archdischild-2011-300914

Arslan, S. S., & Ilgaz, F. (2018). *The Effect of the Inability to Intake Chewable Food Texture on Growth , Dietary Intake and Feeding Behaviors of Children with Cerebral Palsy*. 205–214.

Bell, K. L., & Samson-Fang, L. (2013). Nutritional management of children with cerebral palsy. *European Journal of Clinical Nutrition*, *67*(S2), S13–S16. https://doi.org/10.1038/ejcn.2013.225

Boyle, C. A., Boulet, S., Schieve, L. A., Cohen, R. A., Blumberg, S. J., Yeargin-Allsopp, M., … Kogan, M. D. (2011). Trends in the prevalence of developmental disabilities in US children, 1997-2008. *Pediatrics*, *127*(6), 1034–1042. https://doi.org/10.1542/peds.2010-2989

Brooks, J., Day, S., Shavelle, R., & Strauss, D. (2011). Low weight, morbidity, and mortality in children with cerebral palsy: New clinical growth charts. *Pediatrics*, *128*(2). https://doi.org/10.1542/peds.2010-2801

Caramico-Favero, D. C. O., Guedes, Z. C. F., & de MORAIS, M. B. (2018). Food intake, nutritional status and gastrointestinal symptoms in children with cerebral palsy. *Arquivos de Gastroenterologia*, *55*(4), 352–357. https://doi.org/10.1590/s0004-2803.201800000-78

County, S. (2008). *Nutrition Screening for Infants and Young Children with Special Health Care Needs: Spokane County, Washington, October 2008*. (October).

Culley, W. J., & Middleton, T. O. (1969). Caloric requirements of mentally retarded children with and without motor dysfunction. *The Journal of Pediatrics*, *75*(3), 380–384. https://doi.org/10.1016/S0022-3476(69)80262-3

Dahlseng, M. O., Finbråten, A. K., Júlíusson, P. B., Skranes, J., Andersen, G., & Vik, T. (2012). Feeding problems, growth and nutritional status in children with cerebral palsy. *Acta Paediatrica, International Journal of Paediatrics*, *101*(1), 92–98. https://doi.org/10.1111/j.1651-2227.2011.02412.x

Day, S. M., Strauss, D. J., Vachon, P. J., Rosenbloom, L., Shavelle, R. M., & Wu, Y. W. (2007). Growth patterns in a population of children and adolescents with cerebral palsy. *Developmental Medicine and Child Neurology*, *49*(3), 167–171. https://doi.org/10.1111/j.1469-8749.2007.00167.x

Gulati, S., & Sondhi, V. (2018). Cerebral Palsy: An Overview. *Indian Journal of Pediatrics*, *85*(11), 1006–1016. https://doi.org/10.1007/s12098-017-2475-1

Hall, J. G. (2003). Developmental biology IV Twinning. *The Lancet*, *362*, 735–743. https://doi.org/10.1016/S0140-6736(03)14237-7

Hennessy, E., Hughes, S. O., Goldberg, J. P., Hyatt, R. R., & Economos, C. D. (2010). Parent behavior and child weight status among a diverse group of underserved rural families. *Appetite*, *54*(2), 369–377. https://doi.org/10.1016/j.appet.2010.01.004

Herrera-Anaya, E., Angarita-Fonseca, A., Herrera-Galindo, V. M., Martínez-Marín, R. D. P., & Rodríguez-Bayona, C. N. (2016). Association between gross motor function and nutritional status in children with cerebral palsy: a cross-sectional study from Colombia. *Developmental Medicine and Child Neurology*, *58*(9), 936–941. https://doi.org/10.1111/dmcn.13108

Hogan, S. E. (2004). Energy requirements of children with cerebral palsy. *Canadian Journal of Dietetic Practice and Research*, *65*(3), 124–130. https://doi.org/10.3148/65.3.2004.124

Huang, Y. P., Kellett, U. M., & St John, W. (2010). Cerebral palsy: Experiences of mothers after learning their child's diagnosis. *Journal of Advanced Nursing*, *66*(6), 1213–1221. https://doi.org/10.1111/j.1365-2648.2010.05270.x

Kakooza-Mwesige, A., Tumwine, J. K., Eliasson, A. C., Namusoke, H. K., & Forssberg, H. (2015). Malnutrition is common in Ugandan children with cerebral palsy, particularly those over the age of five and those who had neonatal complications. *Acta Paediatrica, International Journal of Paediatrics*, *104*(12), 1259–1268. https://doi.org/10.1111/apa.13089

Ketelaar, M., Volman, M. J. M., Gorter, J. W., & Vermeer, A. (2008). Stress in parents of children with cerebral palsy: What sources of stress are we talking about? *Child: Care, Health and Development*, *34*(6), 825–829. https://doi.org/10.1111/j.1365-2214.2008.00876.x

Kilpinen-Loisa, P., Pihko, H., Vesander, U., Paganus, A., Ritanen, U., & Mäkitie, O. (2009). Insufficient energy and nutrient intake in children with motor disability. *Acta Paediatrica, International Journal of Paediatrics*, *98*(8), 1329–1333. https://doi.org/10.1111/j.1651-2227.2009.01340.x

Kuperminc, M. N., & Stevenson, R. D. (2008). Growth and nutrition disorders in children with cerebral palsy. *Developmental Disabilities Research Reviews*, *14*(2), 137–146. https://doi.org/10.1002/ddrr.14

Lovelace, S., & Rabiee-Khan, F. (2015). Food choices made by low-income households when feeding their pre-school children: A qualitative study. *Maternal and Child Nutrition*, *11*(4), 870–881. https://doi.org/10.1111/mcn.12028

Marques, J., & Sá, L. (2016). Feeding a child with cerebral palsy: parents' difficulties. *Revista de Enfermagem Referência, IV Série*(11), 11–19. https://doi.org/10.12707/riv16041

Morgan, F., & Tan, B. K. (2011). Rehabilitation for children with cerebral palsy in rural Cambodia: Parental perceptions of family-centred practices. *Child: Care, Health and Development*, *37*(2), 161–167. https://doi.org/10.1111/j.1365-2214.2010.01170.x

O'Callaghan, M., & Maclennan, A. (2013). Cesarean delivery and cerebral palsy: A systematic review and meta-analysis. *Obstetrics and Gynecology*, *122*(6), 1169–1175. https://doi.org/10.1097/AOG.0000000000000020

Ochiai, H., Shirasawa, T., Ohtsu, T., Nishimura, R., Morimoto, A., Obuchi, R., … Kokaze,

A. (2012). Number of siblings, birth order, and childhood overweight: A population-based cross-sectional study in Japan. *BMC Public Health*, *12*(1), 1. https://doi.org/10.1186/1471-2458-12-766

Olawale, O. A., Deih, A. N., & Yaadar, R. K. K. (2013). Psychological impact of cerebral palsy on families: The African perspective. *Journal of Neurosciences in Rural Practice*, *4*(2), 159–163. https://doi.org/10.4103/0976-3147.112752

Rehab, B. K. (2012). *(Caregiver Priorities & Child Health Index of Life with Disabilities) Keutamaan Penjaga dan Indeks Kesihatan Kanak-Kanak Berkeperluan Khas Arahan*. 1–8.

Rempel, G. (2015). The Importance of Good Nutrition in Children with Cerebral Palsy. *Physical Medicine and Rehabilitation Clinics of North America*, *26*(1), 39–56. https://doi.org/10.1016/j.pmr.2014.09.001

Rogers, B. (2004). Feeding Method and Health Outcomes of Children With. *J Pediatr*, *145*, S28–S32.

Safiza Mohamad Nor, N., Abdul Aziz, N. S., Siew Man, C., Ambak, R., & Azahadi Omar, M. (2015). Nutritional Status of Children with Autism Spectrum Disorders, Cerebral Palsy and Down Syndrome: A Scoping Review. *The Open Access Journal of Science and Technology*, *3*. https://doi.org/10.11131/2015/101174

Sellier, E., Uldall, P., Calado, E., Sigurdardottir, S., Torrioli, M. G., Platt, M. J., & Cans, C. (2012). Epilepsy and cerebral palsy: Characteristics and trends in children born in 1976-1998. *European Journal of Paediatric Neurology*, *16*(1), 48–55. https://doi.org/10.1016/j.ejpn.2011.10.003

Sleigh, G. N. (2005). Mothers' voice: A qualitative study on feeding children with cerebral palsy. *Child: Care, Health and Development*, *31*(4), 373–383. https://doi.org/10.1111/j.1365-2214.2005.00521.x

Stallings, V. A., Charney, E. B., Davies, J. C., & Cronk, C. E. (1993). Nutrition-Related Growth Failure of Children With Quadriplegic Cerebral Palsy. *Developmental Medicine & Child Neurology*, *35*(2), 126–138. https://doi.org/10.1111/j.1469-8749.1993.tb11614.x

Tollaň es, M. C., Wilcox, A. J., Lie, R. T., & Moster, D. (2014). Familial risk of cerebral palsy: Population based cohort study. *BMJ (Online)*, *349*(July), 1–9. https://doi.org/10.1136/bmj.g4294

Town, C., Paediatric, M., & Group, I. (2009). Anthropometry Guideline Paediatrics. *Screening*, (April), 19–68.

Tseng, M. H., Chen, K. L., Shieh, J. Y., Lu, L., & Huang, C. Y. (2011). The determinants of daily function in children with cerebral palsy. *Research in Developmental Disabilities*, *32*(1), 235–245. https://doi.org/10.1016/j.ridd.2010.09.024

UNICEF. (2017). Knowledge , Attitudes and Practices (Kap) Study. *Article*.

Walker, J. L., Bell, K. L., Boyd, R. N., & Davies, P. S. W. (2012). Energy requirements in preschool-age children with cerebral palsy. *American Journal of Clinical Nutrition*, *96*(6), 1309–1315. https://doi.org/10.3945/ajcn.112.043430

Wang, F., Cai, Q., Shi, W., Jiang, H., Li, N., Ma, D., … Mu, D. (2016). A Cross-sectional

Survey of Growth and Nutritional Status in Children With Cerebral Palsy in West China. *Pediatric Neurology*, *58*, 90–97. https://doi.org/10.1016/j.pediatrneurol.2016.01.002

Weir, K. A., Bell, K. L., Caristo, F., Ware, R. S., Davies, P. S., Fahey, M., … Boyd, R. N. (2013). Reported eating ability of young children with cerebral palsy: Is there an association with gross motor function? *Archives of Physical Medicine and Rehabilitation*, *94*(3), 495–502. https://doi.org/10.1016/j.apmr.2012.10.007

Wijesinghe, C. J., Cunningham, N., Fonseka, P., Hewage, C. G., & Østbye, T. (2015). Factors associated with caregiver burden among caregivers of children with cerebral palsy in Sri Lanka. *Asia-Pacific Journal of Public Health*, *27*(1), 85–95. https://doi.org/10.1177/1010539514548756

Zainah, S. H., Ong, L. C., Sofiah, A., Poh, B. K., & Hussain, I. H. M. I. (2001). Determinants of linear growth in Malaysian children with cerebral palsy. *Journal of Paediatrics and Child Health*, *37*(4), 376–381. https://doi.org/10.1046/j.1440-1754.2001.00693.x

Appendix A: Approval Letter from MREC

Appendix B: Consent form and Questionnaire

Kami adalah kumpulan penyelidik daripda Jabatan Pemakanan dan Dietetik, Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia.

Tujuan kajian ini adalah untuk mengkaji perkaitan tentang pengetahuan, sikap dan amalan ibu serta faktor-faktor lain yang mempengaruhi terhadap status pertumbuhan Kanak-kanak Cerebral Palsy. Penyertaan anda akan menyumbang kepada kejayaan dalam kaji selidik ini. Kami amat menghargai kerjasama anda dalam menyertai kaji selidik ini, dan jawapan anda bersifat sulit dan akan digunakan untuk **tujuan akademik sahaja.**

Arahan

Borang Soal selidik ini merangkumi 4 bahagian utama. Sila lengkapkan SEMUA item dalam SETIAP bahagian dengan memilih jawapan yang bertepatan dengan anda.

A. Maklumat Sosiodemografik

B. Sejarah Perubatan Anak

C. Rekod Pemakanan Anak

D. Soal Selidik Pengetahuan, Sikap, Cara Pemakanan Untuk Kanak-Kanak CP Dan Masalah Nutritisi Yang Dihadapi.
   - Bahagian 1
   - Bahagian 2
   - Bahagian 3
   - Bahagian 4

Untuk sebarang pertanyaan atau soalan mengenai soal selidik kami, sila hubungi:
Abdul Rasyid Ismail (013-3307675)
Muhammad Sufiyullah bin Mohamad Nor (017-6814091)

Borang Soal Selidik tentang Faktor-faktor yang Mempengaruhi Tumbesaran Kanak-kanak Cerebral Palsy

Questionnaire on Factor Associated with Growth Status among Cerebral Palsy Children

A. Maklumat Sosiodemografik

Sila isi/tanda pada pernyataan yang berkenaan.
Please fill in/tick at the relevant statement.

1.0 Maklumat Anak

Nama:

Umur: Tarikh lahir:

Adik beradik: _____

Jantina : ☐ Lelaki ☐ Perempuan

Kaum : ☐ Melayu ☐ Cina ☐ India

Status pembelajaran anak:

	Tidak bersekolah
	Sekolah Pendidikan Khas
	Pusat Pemulihan Dalam Komuniti
	Lain-lain :_____

2.0 Maklumat Ibu Bapa/Penjaga

Taraf pendidikan:

	Tidak bersekolah secara formal
	Sekolah rendah
	Sekolah menengah
	Diploma
	Sarjana Muda
	Sarjana/PhD
	Lain-lain:_____

Status pekerjaan:

	Kerajaan
	Swasta
	Bekerja sendiri
	Bersara
	Tidak bekerja

Jumlah pendapatan keluarga dalam sebulan:

	RM3,000 dan ke bawah
	RM3,001 – RM5,000
	RM5,001 – RM10,000
	RM10,001 dan ke atas

B. Sejarah Perubatan

Sila isi/tanda pada pernyataan yang berkenaan.
Please fill in/tick at the relevant statement.

Jenis kelumpuhan *Cerebral Palsy*:

	Beberapa anggota badan sahaja seperti tangan dan kaki (*monoplegia*) *One extremity involved either lower or upper (monoplegia)*
	Separuh badan seperti lumpuh daripada pinggang ke kaki (*diplegia*) *Gross motor problems particularly in lower limbs (diplegia)*
	Sebahagian badan sama ada sebelah kiri atau kanan sahaja (*hemiplegia*) *Part of body either left or right only (hemiplegia)*
	Seluruh anggota badan (*quadriplegia*) *The whole limbs including upper and lower (quadriplegia)*

Tahap kebolehupayaan fungsi motor kasar anak anda (*Gross Motor Function System - GMFCS*)

	Boleh berjalan/ menaiki tangga tanpa berpaut pada pemegang/ berlari tetapi kurang pantas dan seimbang. (*GMFCS I*) *Able to walk/ climb the stairs without the use of railing/ able to run but speed and balance are limited (GMFCS I)*
	Boleh berjalan tetapi hanya seketika atau dalam jarak yang pendek sahaja/ sukar berjalan pada permukaan yang tidak rata dan memerlukan bantuan. (*GMFCS II*) *Only able to walk in short distances/ difficulty in walking on uneven terrain and require physical assistance (GMFCS II)*
	Boleh berjalan hanya dengan menggunakan tongkat beroda/ bergerak menggunakan kerusi roda dan mampu menggerakkannya menggunakan tangan. (*GMFCS III*) *Able to walk only by using a hand-held mobility device/ use wheeled mobility and able to move and use hands (GMFCS III)*
	Hanya mampu bergerak menggunakan tongkat beroda dengan sokongan dan bantuan orang lain/ atau menggunakan peralatan lain seperti kerusi roda automatic. (*GMFCS IV*) *Only able to move using hand-held mobility device with assistance/ use of other device such as motored wheelchair (GMFCS IV)*
	Tidak mampu berjalan dan bangun, sepenuhnya bergantung kepada bantuan orang lain dan alat sokongan/ tidak mampu menahan kedudukan kepala dalam keadaan sentiasa tegak. (*GMFCS V*) *Children are fully dependant on assistance and mobility device/ children are limited in their ability to maintain antigravity head and trunk postures. (GMFCS V)*

Kelahiran kembar/ *Twin birth*: ☐ Ya ☐ Tidak

Kelahiran pramatang/ *Preterm birth*: ☐ Ya ☐ Tidak

Cara/kaedah yang dialami ketika melahirkan :

	Normal (*Spontaneous Vaginal Delivery, SVD*)
	Pembedahan Rahim (*Cesarean Section, CS*)
	Bantuan vaccum (*Vaccum-assissted vaginal delivery, VAVD*)

Adakah anak anda pernah mengalami kemalangan/komplikasi semasa kelahiran atau semasa kecil yang menjadi penyebab Cerebral Palsy? *boleh tanda lebih daripada satu / *Has your child ever had*

*accidents / complications during childbirth or childhood that cause Cerebral Palsy? * can mark more than one*

	Komplikasi semasa kelahiran/ *Complications during birth*
	Demam panas yang teruk sehingga dimasukkan ke wad / *Fever leading to ward admittance*
	Terjatuh ketika usia kecil dan pengsan / *Fell during childhood and fainted*
	Sawan atau epilepsi / *Seizure or epilepsy*
	Tidak tahu punca / *Unknown reasons*
	Tiada di atas, nyatakan/ *Not mentioned above, please state*:_____

C. Rekod pemakanan 24 jam

24-hour Diet recall

Sila lengkapkan rekod pemakanan anak anda

Hari biasa:

Waktu Makan	**Makanan/ Menu**	**Kuantiti** (sudu/ cawan/ mangkuk/ senduk/ sudu teh/ sudu makan)
Contoh: Sarapan (9 pg)	*Nasi Goreng + telur mata* *Roti + kaya* *Milo*	*2 senduk + 1 biji* *1 keping + 1 sudu teh* *1 kotak (200ml)*
Sarapan *Breakfast*		
Minum Pagi *Morning tea*		
Makan tghr *Lunch*		
Minum Ptg *Afternoon tea*		

Makan Mlm *Dinner*		
Minum Mlm *Supper*		

Hari minggu:

Waktu Makan	**Makanan/ Menu**	**Kuantiti** (sudu/ cawan/ mangkuk/ senduk/ sudu teh/ sudu makan)
Contoh: Sarapan (9 pg)	*Nasi Goreng + telur mata* *Roti + kaya* *Milo*	*2 senduk + 1 biji* *1 keping + 1 sudu teh* *1 kotak (200ml)*
Sarapan *Breakfast*		
Minum Pagi *Morning tea*		
Makan tghr *Lunch*		
Minum Ptg *Afternoon tea*		

Makan Mlm *Dinner*		
Minum Mlm *Supper*		

D. Soal Selidik Pengetahuan, Sikap, Cara Pemakanan Oleh Ibu bapa/penjaga Unutk Kanak-Kanak CP Dan Masalah Nutritisi Yang Dihadapi.

Bahagian 1:
Sila jawab semua soalan di bawah dan bulatkan HANYA satu jawapan sahaja berdasarkan pengetahuan anda.
Please answer the following questions and circle ONLY one answer based on your knowledge.

1. Di manakah antara berikut penyebab kepada CP dalam kalangan kanak-kanak?
   Which of the following are the causes of Cerebral Palsy in children?
   a) Diwarisi daripada ibu bapa
      Inherited from parents
   b) Kecederaan otak
      Brain injury
   c) Kemalangan
      Accident
   d) Malnutrisi
      Malnutrition

2. Di manakah antara penyakit berikut yang menyebabkan kekejangan dan kesusahan dalam koordinasi?
   Which of the following disease causes spasm & difficulty in coordination?

   a) Cerebral Palsy
   b) Meningitis
   c) Chicken Pox
   d) Mental retardation

3. Apakah tanda awal Cerebral Palsy semasa bayi?

What is the early sign of CP during infancy?

a) Kesusahan untuk menyedut botol/ semasa menyusu
Early sucking difficulty with breast or bottle
b) Lebih pengambilan makanan
Intake of more food
c) Kurang pengambilan makanan
Intake of less food
d) Cirit-birit yang berterusan
Continuous diarrhea

4. Yang manakah antara berikut adalah petanda Cerebral Palsy?
Which of the following is a sign of Cerebral Palsy?

a) Pergerakan badan yang tidak bertujuan
Purposeless body movements
b) Kemerahan di seleruh badan
Redness all over the body
c) Bengkak di kaki
Swelling on the leg

5. Bagaimanakah anda mengekalkan pemakanan yang mencukupi?
How do you maintain adequate nutrition?

a) Mengetahui keperluan kalori
Recognizing the calorie needs
b) Memberi makanan apabila anak menangis
Feeding whenever the child cries
c) Lebihkan air dalam diet mereka
Including more water in the diet
d) Benarkan berada di dalam tandas
Allowing him to sit in the toilet

6. Anak anda memerlukan peralatan untuk membantu mereka:
Your child may require equipment to help with:
a) Berjalan/ Bergerak
Walking/ Mobility
b) Bercakap/ Komunikasi
Talking/ Communication
c) Makan, Mandi dan menggunakan tandas
Eating, bathing and toileting
d) Berjalan/ Bergerak , Bercakap/ Komunikasi
Walking/ Mobility , Talking/ Communication

7. Bagaimanakah pakar fisiologi membantu?
How can a physiotherapist be helpful?

a) Menulis di papan putih
Writing on the board

b) Membantu ibu bapa untuk menjadi lebih mahir dalam membantu anak mereka
Helping the parents to become skillful in assisting their child
c) Bermain dengan anak tersebut
Playing with the child
d) Memberi anak tersebut makan
Feeding the child

Bahagian 2:

Sila baca setiap pernyataan berikut dan tandakan (/) pada SATU ruangan sahaja sama ada 1, 2, 3, 4 atau 5 yang menunjukkan berapa banyak pernyataan tersebut berkaitan kepada anda .*Please read each of the following statement and tick (/) on ONE number either 1, 2, 3, 4 or 5 which indicates how much the statement applied to you.*

1	2	3	4	5
Tidak Setuju *Disagree*	**Sedikit Tidak Bersetuju** *Slightly Disagree*	**Biasa-biasa** *Neutral*	**Sedikit Bersetuju** *Slightly Agree*	**Bersetuju** *Agree*

Section 2 (*a Study on the Knowledge Attitude and Practice of,* 2014)		**1**	**2**	**3**	**4**	**5**
1	Saya tahu bahawa ketidakupayaan fizikal anak saya berpunca daripada Cerebral Palsy. *I think that the physical disabilities of my child is caused by Cerebral Palsy*					
2	Saya menerima anak saya setelah mengetahui anak saya menghidap Cerebral Palsy *I accept my child after knowing that my child has Cerebral Palsy*					
3	Ahli keluarga yang lain menerima anak saya setelah mengetahui dia menghidap Cerebral Palsy *The other family members accept my child after knowing that my child has Cerebral Palsy*					
4	Ahli keluarga yang lain memberi layanan yang baik terhadap anak saya yang menghidap Cerebral Palsy *The other family members treat your child who has Cerebral Palsy well*					
5	Kelahiran anak saya sedikit sebanyak memberi tekanan kepada saya sebagai seorang ibu/penjaga *The birth of my child gives pressure to you as a mother/caregiver*					

Bahagian 3:

Sila baca setiap pernyataan berikut dan tandakan (/) pada SATU ruangan sahaja sama ada 1, 2, 3, 4 atau 5 yang menunjukkan berapa banyak pernyataan tersebut berkaitan kepada anda .*Please read each of the following statement and tick (/) on ONE number either 1, 2, 3, 4 or 5 which indicates how much the statement applied to you.*

1	2	3	4	5
Tidak Pernah	**Jarang Sekali**	**Kadang-kadang**	**Kebiasaannya**	**Selalu**

Never	*Rarely*	*Sometimes*	*Mostly*	*Always*

	Section 3	**1**	**2**	**3**	**4**	**5**
1	Saya risau anak saya akan mengalami masalah kurang berat badan *I am worried my child being underweight*					
2	Saya berasa sedih jika anak saya tidak makan dengan cukup *I feel upset if my child not eat enough.*					
3	Saya risau jika anak saya tidak makan dengan cukup *I am worried if my child not eat enough.*					
4	Saya membiarkan anak saya makan apa-apa sahaja yang dia mahu *I let my child eat whatever he/she wants.*					
5	Saya menyediakan makanan lain sekiranya anak saya tidak makan makanan yang diberi *I make something else if my child not consume the served food.*					
6	Saya sentiasa memastikan anak saya mendapatkan jumlah nutrisi yang cukup *I always keep my child obtain adequate nutritional intake*					

7	Berapa kerapkah anda memantau makanan anak anda yang tinggi lemak (ayam goreng, fries, mayonis, keju) *How much do you keep track of high fat food that your child eats?*					
8	Berapa kerapkah anda memantau pengambilan sayur-sayuran dan buah-buahan terhadap anak anda? *How often do you keep track of vegetables and fruits intake of your child?*					
9	Adakah anda membiarkan anak anda makan dengan sendiri? *Do you let your child eat on their own?*					
10	Berapa kerapkah anak anda makan bersama-sama dengan ahli keluarga yang lain ketika waktu makan? *How often does your child eat together with the other family members during mealtime?*					
11	Saya menyediakan makanan untuk anak saya. *I am the one who prepare meal for my child*					
12	Adakah anda berkomunikasi/berbual bersama anak anda ketika waktu makan? *Do you communicate/chatting with your child during mealtime?*					
13	Adakah anda ada memberi makanan tambahan/supplement (vitamin, susu formula) kepada anak anda? *Do you give additional food/supplement (vitamin, enteral product) to your child?*					
14	Berapa kerapkah anda mendapatkan nasihat daripada dietitian tentang pemakanan anak anda? *How often do you meet up the dietitian to get advice on your feeding practice towards your CP child?*					

Bahagian 4: (County, 2008)

Bagaimana anda menilai status anak anda?
How does your child appear to you?

	Terlebih berat badan *Overweight*
	Kurang berat badan *Underweight*
	Seperti biasa *Just right*
	Bantut *Short*

Weight:_____
Height :_____

Sila baca setiap pernyataan berikut dan tandakan (/) pada SATU ruangan sahaja sama ada 1, 2, 3, 4 atau 5 yang menunjukkan berapa banyak pernyataan tersebut berkaitan kepada anda .*Please read each of the following statement and tick (/) on ONE number either 1, 2, 3, 4 or 5 which indicates how much the statement applied to you.*

1	2	3	4	5
Tidak Pernah *Never*	**Jarang Sekali** *Rarely*	**Kadang-kadang** *Sometimes*	**Kebiasaannya** *Mostly*	**Selalu** *Always*

1. Adakah situasi seperti di bawah ini terjadi terhadap pengambilan makanan anak anda?
Do any of the following below apply to your childs food intake?

	1	2	3	4	5
Menolak banyak jenis makanan *Refuse many foods*					
Menolak atau tidak boleh makan makanan yang keras/pepejal (nasi, ayam, biskut) *Refuse or not able to consume solid foods?*					
Makan kurang daripada 3 kali sehari *Eats fewer than 3 times per day.*					
Minum lebih daripda 1.2 liter (5 cawan) sehari? *Drinks more than 1.2 litre (5 cups) per day?*					
Makan terlau banyak *Eats too much*					
Makan terlalu sikit *Eats too little*					

2. Adakah anak anda mempunyai masalah ketika makan seperti di bawah:
Does your child have any feeding or eating problems as below:

	1	2	3	4	5
Sukar untuk menyedut *Difficulty sucking*					
Sukar untuk makan sendiri *Difficulty feeding self*					
Mudah tercekik makanan yang pejal/keras *Chokes on solids*					
Sukar untuk mengunyah *Difficulty chewing foods*					
Mudah tercekik/tersedak ketika minum (termasuk makan makanan yang berbentuk cecair seperti bubur) *Chokes on liquids*					
Mudah terkeluar makanan daripada mulut *Loses food from mouth*					
Masih menggunakan botol selepas umur 2 tahun *Using bottle after age 2 years*					

Sukar minum menggunakan cawan *Difficulty drinking from a cup*					
Menagambil masa yang lama untuk menghabiskan makanan *Take much time to finish eating*					

Masalah lain yang tidak disebutkan jika ada:_____

3. Adakah anak anda makan menggunakan tiub? Yes ☐ No ☐
Does your child have a feeding tube?

4. Adakah anak anda sedang dalam diet khas disebabkan status perubatan? Yes ☐ No ☐
Is your child on a special diet for a medical conditions?

5. Adakah anak anda mempunyai alahan/alergik terhadap sesuatu makanan? Yes ☐ No ☐
Is your child allergic or intolerant of any foods?

6. Dalam tempoh 3 bulan yang lepas, adakah anak anda menagalami masalah sistem usus seperti di bawah?
In the last 3 month, does your child suffer with gastrointestinal problems as below?

	Yes	No
Cirit-birit *Diarrhea*		
Sembelit (buang air besar kurang drpd 3x/minggu) *Constipation (bowel motion less than 3 times/week)*		
Kerap muntah *Often vomit*		

BORANG PERSETUJUAN/ KEIZINAN PESERTA

Tajuk Penyelidikan : Maternal Knowledge, Attitude and Feeding Practice on Growth Status Among Children with Cerebral Palsy

Dengan menandatangani di bawah, saya mengesahkan bahawa :

- Saya telah diberi maklumat tentang penyelidikan di atas secara lisan dan bertulis and saya telah membaca dan memahami segala maklumat yang diberikan dalam risalah ini.

- Saya telah diberikan masa yang secukupnya untuk mempertimbangkan penyertaan saya dalam penyelidikan ini dan telah diberi peluang untuk bertanyakan soalan dan semua persoalan saya telah dijawab dengan sempurna dan memuaskan.

- Saya juga faham bahawa penyertaan saya adalah secara sukarela dan pada bila-bila masa saya bebas menarik diri daripada penyelidikan ini tanpa harus memberi sebarang alasan dan ianya sama sekali tidak akan menjejaskan rawatan perubatan saya pada masa akan datang. Saya juga memahami tentang risiko dan manfaat penyelidikan ini dan saya secara sukarela memberi persetujuan untuk menyertai penyelidikan ini di bawah syarat-syarat yang telah dinyatakan di atas.

- Dengan mengemukakan borang ini, anda dengan ini memberi persetujuan kepada kami bagi memproses data dan apa-apa kemas kini maklumat anda, untuk tujuan penyelidikan kami.

Tandatangan:

_____

Nama:

Tarikh: