PARENTAL NUTRITIONAL AWARENESS OF THEIR PRESCHOOL CHILDREN AT PRIVATE PRESCHOOLS IN TAMAN SCIENTEX, PASIR GUDANG, JOHOR.

NUR AMALIA SHAFIKA BINTI MOHD YUSOF

SCHOOL OF HEALTH SCIENCES
UNIVERSITI SAINS MALAYSIA

2024

PARENTAL NUTRITIONAL AWARENESS OF THEIR PRESCHOOL CHILDREN AT PRIVATE PRESCHOOLS IN TAMAN SCIENTEX, PASIR GUDANG, JOHOR.

by

NUR AMALIA SHAFIKA BINTI MOHD YUSOF

Dissertation submitted in partial fulfilment of
the requirements for the degree of
Bachelor in Nursing with Honours

August 2024

CERTIFICATE

This is to certify that the dissertation entitled “Parental Nutritional Awareness of their Preschool Children at Private Preschool in Taman Scientex, Pasir Gudang, Johor” is the research done by “Ms. Nur Amalia Shafika binti Mohd Yusof” during the period from October 2023 until June 2024 under my supervision. I have read this dissertation and in my opinion, it confirms acceptable standards of supervision of scholarly presentation and is fully adequate, in scope and quality, as a dissertation to be submitted in partial fulfilment for degree of Bachelor of Nursing (Honours).

DECLARATION

I hereby declare that this dissertation is the result of my investigations, except where otherwise stated and duly acknowledged. I also declare that is has not been previously or concurrently submitted as a whole for any other degree at Universiti Sains Malaysia or other institutions. I grant Universiti Sains Malaysia the right to use the dissertation for teaching, research and promotional purposes.

ACKNOWLEDGEMENT

I would like to convey my heartfelt gratitude to Puan Hasni Embong and Dr Noor Shuhada binti Salleh, my supervisor and co-supervisor, for convincingly guiding and encouraging me to be professional and do the right thing even when the going got rough. I am grateful for their invaluable advice and support and for patiently guiding me through this study process. As this was my first time handling a research study, it was challenging to accomplish without their advice and expertise. The goal of this study would not have been attained without their unwavering support.

I wish to acknowledge my parents' support and great love, Mr Mohd Yusof bin Daud and Mrs Raziah binti Abd Latif, and my friends for their everlasting moral support. They kept me going throughout the year by continually assisting and supporting me.

I deeply appreciate the contributions of all those who have directly or indirectly encouraged me to finish my thesis successfully. I would not have any worthwhile words to express my gratitude, but my heart is still overflowing with gratitude for the kindness shown to me by everyone.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATION

USM	Universiti Sains Malaysia
HBM	Health Belief Model
SPSS	Statistical Package Social Sciences
HREC	Human Research Ethical Committee
BMI	Body Mass Index
WHO	World Health Organization
CDC	Centers for Disease Control and Prevention
UNICEF	United Nations International Children's Emergency Fund

KESEDARAN IBU BAPA TERHADAP NUTRISI ANAK MEREKA DI PRASEKOLAH TADIKA SWASTA DI TAMAN SCIENTEX, PASIR GUDANG, JOHOR.

ABSTRAK

Nutrien ialah bahan yang menyediakan pemakanan penting untuk pertumbuhan dan kesihatan. Nutrien penting untuk pengeluaran tenaga, pembaikan sel, dan menjaga sistem imun yang kuat. Kesedaran ibu bapa terhadap nutrisi sangat penting kerana ia secara langsung mempengaruhi tabiat pemakanan dan kesihatan keseluruhan anak-anak mereka. Kajian ini bertujuan untuk menilai kesedaran ibu bapa terhadap nutrisi anak prasekolah mereka di prasekolah swasta di Taman Scientex, Pasir Gudang, Johor. Kajian keratan rentas telah dijalankan terhadap ibu bapa yang mempunyai anak berusia 4 hingga 6 tahun. Data dikumpulkan menggunakan soal selidik yang diisi sendiri yang diadaptasi daripada Halder & Kejriwal (2016), daripada Mac sehingga Mei 2024. Sebanyak 190 ibu bapa dari prasekolah swasta di Taman Scientex, Pasir Gudang, Johor yang memenuhi kriteria inklusi dan eksklusi terlibat dalam kajian ini. Mereka dipilih melalui kaedah persampelan rawak mudah kebarangkalian. Data yang dikumpulkan dianalisis secara statistik menggunakan perisian SPSS versi 27. Kajian ini menggunakan statistik deskriptif dan Ujian Tepat Fisher. Keputusan menunjukkan bahawa 119 (62.6%) peserta mempunyai tahap kesedaran pemakanan yang baik. Terdapat hubungan antara data sosiodemografi [tahap pendidikan (p=0.003), pendapatan isi rumah (p=0.02) dan BMI anak-anak (p=0.003)] dengan kesedaran pemakanan ibu bapa. Kesedaran pemakanan ibu bapa membantu mengenal pasti jurang pengetahuan dan amalan, membolehkan intervensi untuk memperbaiki tabiat pemakanan anak-anak. Ini menggalakkan pemakanan sihat, mencegah obesiti, kekurangan zat makanan, dan kelewatan perkembangan, menyumbang kepada kesejahteraan jangka panjang anak-anak.

PARENTAL NUTRITIONAL AWARENESS OF THEIR PRESCHOOL CHILDREN AT PRIVATE PRESCHOOLS IN TAMAN SCIENTX, PASIR GUDANG, JOHOR.

ABSTRACT

Nutrient is a substance that provides essential nourishment for growth and health. Nutrients are crucial for energy production, cell repair, and keeping the immune system strong. Nutritional awareness among parents is very important because it directly influences their children's dietary habits and overall health. The study aims to assess the parental nutritional awareness of their preschool children at private preschools in Taman Scientex, Pasir Gudang, Johor. A cross-sectional study was conducted on parents who have children aged four to six years old. Data was collected using a self-administered questionnaire adapted from Halder & Kejriwal (2016). A total of 190 parents from private preschools at Taman Scientex, Pasir Gudang, and Johor who fulfilled the inclusion and exclusion criteria were involved in this study. They were selected through a probability simple random sampling method. Data collected were statistically analysed using the SPSS software version 27. The study used descriptive statistics and the Fisher's Exact Test. The results show that 119 (62.6%) of participants have a good level of awareness of nutritional. There was an association between sociodemographic data [level of education ($p=0.003$), household income ($p=0.02$) and children's BMI ($p=0.003$)] with parental nutritional awareness. In conclusion, parental nutritional awareness helps identify gaps in knowledge and practices, enabling interventions to improve children's eating habits. This promotes healthy nutrition, prevents obesity, malnutrition, and developmental delays, contributing to the long-term well-being of children.

CHAPTER 1

INTRODUCTION

1.1 Background of Study

Nutrients are chemical substances found in food that the body uses to function normally and stay healthy (Morris & Mohiuddin, 2020). Children need to get enough nutrients for their growth development to be in a normal state. Adequate nutrition means enough for proteins, fats, carbohydrates, vitamins, and minerals. Children are in a phase where they need a lot of nutrition to help their growth. However, excessive nutrition can cause obesity or overweight, while insufficient nutrition causes undernutrition or stunting in the child. Overweight and obesity are described as abnormal or excessive fat accumulations that can harm one's health. Malaysia faces a double burden: stunting and obesity (Rahim et al., 2023). This is typically caused by children not eating enough of the correct meals.

According to the World Health Organization (WHO), obesity affects more than one billion people globally, including 650 million adults, 340 million adolescents, and 39 million children. This figure is steadily rising (WHO, 2022). According to WHO, nearly 167 million individuals - adults and children - will be less healthy by 2025 as a result of being overweight or obese (WHO, 2022). In 2019, The National Health and Morbidity Survey (NHMS) found obesity affected 14.8% of children between the ages of five and 17, a considerable increase from the 6.1% reported in 2011 and more concerningly, according to the NHMS 2015, 1.65 million schoolchildren in Malaysia are anticipated to be overweight or obese by 2025 (NHMS, 2019). Around the world, the number of obese people has more than doubled since 1980. From 1990 to 2012, 10

million more children in sub-Saharan Africa were overweight or obese than there were in 1990 (Chan, 2017).

On the contrary, according to UNICEF, undernutrition causes over half of all fatalities in children under the age of five; it also increases the incidence and severity of common diseases in children and slows their recovery. The proportion of Malaysian children under the age of five who were underweight or stunted went from 11.6 and 16.6% in 2011 to 14.1 and 21.8% in 2019 (Lee et al., 2022). We are still a long way from living in a world without malnutrition

1.2 Problem Statement

The link between nutrition and children's health level for the future is very important. Effective nutritional practices are required for children's healthy development and growth, which aids in producing adequate immunity and reduces morbidity and mortality from infectious and noncommunicable diseases (Mian et al., 2017). Childhood obesity is a significant medical issue that has an impact on the health of children and adolescents. The matter is particularly problematic because excess weight often contributes children to health conditions that were previously believed to primarily affect adults, namely diabetes, hypertension, and high cholesterol levels. When children are diagnosed with these conditions, their hospitalization duration increases, significantly impacting their childhood experience (Hibbard, 2020).

Obesity in childhood can also lead to low self-esteem and depression (Moradi et al., 2021). Individuals with larger body sizes and physiques may likely encounter mockery or bullying within the school environment. Similarly, children who have nutritional shortages may exhibit stunted growth and a state of weakness. Individuals who possess more diminutive physical stature may become targets of bullying, which can

subsequently lead to a negative self-perception and a preference for solitude due to fear of interpersonal interactions (Jackson et al., 2017).

This is why it is critical to learn about children's eating habits from their parents; everything begins with the parents. Breakfast, lunch, dinner, snacking time, etc are all prepared by parents. Apart from home nutrition, parents are also responsible for their children's nutrition outside the home, such as in kindergarten. Parents say that nutrition is the most important thing about the food they buy for their kids, but they still buy unhealthy foods (Thompson et al., 2020). Parents may want to feed their kids healthy foods but may not know what makes food healthy or unhealthy (Mahmood et al., 2021). Five to six years old is critical for children's growth, development, and learning. Kids between the ages of five and seven require 1,000-1,600 calories per day (Anju Mobin, 2023), and at that age, they require nutritious foods such as vegetables, fruit, grain foods, dairy, and protein. Limit salty, fatty, and sugary foods, as well as low- fiber foods and beverages high in caffeine or sugar.

According to the NHMS 2022, one in three Malaysian kids aged 13-17 are overweight or obese, 4 in 5 are physically inactive, two in three are sedentary, one in three consume soft drinks every day, and one in 10 eat fast food at least three times a week. Four in five don't eat enough fruits and vegetables (NHMS, 2022). According to the World Health Organization (WHO), lack of certain vitamins and nutrients in young children's meals can lower their immune systems, raise their risk of blindness, and even kill them from common childhood illnesses like diarrhea (WHO, 2021). As part of a national strategy, the Malaysian Medical Association (MMA) urges the government to prioritise early education regarding the significance of healthy practises. Dr. Muruga Raj Rajathurai, the organization’s president, emphasised the importance of early childhood health habits. This helps them adopt a healthy lifestyle as adults. He added children's

obesity, which was rare four to five decades ago, is now a national health issue (Mail, 2023). This study will be conducted among parents at private preschools in Taman Scientex, Pasir Gudang, Johor.

The choice of Taman Scientex in Pasir Gudang, Johor, as the research population is motivated by the region's significance, notably exemplified by the alarming statistic of over 25 thousand deaths in Johor in 2022, ranking it as the second-highest state in Malaysia ("Malaysia: Deaths by State | Statista," 2023). This concerning context, coupled with the additional personal connection to Taman Scientex as the researcher's hometown, underscores the urgency of investigating factors such as parental nutritional awareness in the local community. By doing so, the study aims to contribute insights that may affect public health and well-being in a region with notable health challenges.

1.3 Research Questions

1. What is the level of parental nutritional awareness of their preschool children at private preschools in Taman Scientex, Pasir Gudang, Johor?
2. Is there any association between sociodemographic data (level of education, household income and children's BMI) and parental nutritional awareness?

1.4 Study Objectives

1.4.1 General Objective

To assess the level of parental nutritional awareness of their preschool children at private preschools in Taman Scientex, Pasir Gudang, Johor.

1.4.2 Specific Objective

1. To determine the level of parental nutritional awareness of their preschool children at private preschools in Taman Scientex, Pasir Gudang, Johor.

2. To determine the association between sociodemographic data (level of education, household income and children's BMI) and parental nutritional awareness?

1.5 Study Hypothesis

Hypothesis 1:

***H_0*:** There is no association between sociodemographic data (level of education, household income and children's BMI) and parental nutritional awareness?

***H_A*:** There is an association between sociodemographic data (level of education, household income and children's BMI) and parental nutritional awareness?

1.6 Significance of Study

This study held considerable significance for several reasons. Understanding parental nutritional awareness was critical for promoting healthy eating habits among preschool children. Proper nutrition during early childhood was essential for growth, cognitive development, and building a strong immune system. By identifying gaps in parental knowledge and practices, this study contributed to interventions that ensured children received the nutrients they needed, thereby reducing the risk of stunted growth, low immunity, and other health issues.

Childhood obesity was a growing concern, as highlighted by the increasing rates of overweight and obese children in Malaysia. This condition not only affected physical health, leading to diseases such as diabetes, hypertension, and high cholesterol, but also had psychological impacts, including low self-esteem and depression. By exploring the nutritional practices of parents, the study provided insights that could help combat childhood obesity and its associated health problems.

The findings of this study informed educational programs for parents, helping them understand what constituted a healthy diet for their children. Given the critical role parents played in shaping their children's eating habits, enhanced awareness and knowledge led to better food choices at home and outside, particularly in kindergartens and other early childhood settings.

The study had broader implications for public health policies. With data on parental nutritional awareness and its impact on children's health, policymakers could design targeted interventions to improve child nutrition, such as public health campaigns, school nutrition programs, and policies to limit the availability of unhealthy foods.

Focusing on Taman Scientex in Pasir Gudang, Johor, this study addressed a community with notable health challenges, as evidenced by high mortality rates. The insights gained helped local health authorities and community organizations develop strategies to enhance public health, specifically by improving the nutritional status of young children.

Aligning with the Malaysian Medical Association's call for prioritizing early education on healthy practices, this study supported national efforts to inculcate healthy lifestyle habits from a young age. By providing evidence-based recommendations, it contributed to the broader goal of reducing childhood obesity and fostering long-term health.

By exploring the relationship between parental nutritional awareness and children's health, this study provided actionable insights that could lead to healthier future generations. The local focus on Taman Scientex added relevance and urgency, given the region's health statistics and the researcher's personal connection to the community.

1.7 Conceptual and Operational Definition

Item	Conceptual	Operational
Nutritional	Relating to nutrition or containing a food substance your body can use (Cambridge Dictionary, 2023).	This study refers to the nutrients that children intake in their daily lives.
Awareness	Knowledge that something exists or understanding of a situation or subject at present based on information or experience (Cambridge Dictionary, 2023).	This study refers to the parents' awareness of their children's nutritional intake at private preschools in Taman Scientex, Pasir Gudang, Johor.
Preschool	Describe things relating to the care and education of children before they reach the age when they have to go to school (Collins Dictionary, 2023).	This study refers to the children's preschool to the parents who were selected to do the study at private preschools in Taman Scientex, Pasir Gudang, Johor.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter will review literature on parental nutritional awareness of preschool children at private preschools in Taman Scientex, Pasir Gudang, Johor. The general findings of the literature reviews will be presented in a few sections based on the key terms of the research. Recent articles and related issues are included in this chapter. The chosen conceptual framework to guide this proposed study is discussed.

2.2 Nutrition

We have probably consumed at least 20000 meals in our lives. Without conscious effort, our bodies employ the nutrients from those meals to produce all of their components, fuel their functions, and defend themselves against diseases (Whitney et al., 2019). According to the Collins dictionary (2023), nutrition is the process of taking food into the body and absorbing the nutrients in those foods. Poor nutrition can significantly impact any child's growth, development, muscle strength, immunological function, and wound healing (Rempel, 2019).

The significance of maintaining healthy eating habits and consuming an appropriate diet to guarantee sufficient nutrition for optimal growth and development in childhood is widely acknowledged (Chong et al., 2016). The American Dietetic Association asserts that children between the ages of 2 and 11 should strive to attain optimal physical and cognitive development, maintain a healthy weight, derive pleasure from food, and mitigate the likelihood of chronic diseases by adopting suitable dietary practices and engaging in consistent physical activity (Ogata et al., 2014). Consistent meal

consumption is an essential component of maintainable health. Prior research has indicated that consistent intake of a primary meal, specifically breakfast, is correlated with an improved diet quality and potentially provides substantial advantages to children and adolescents' cognitive and academic achievements (Chong et al., 2016).

Childhood nutrition is critical for laying a firm foundation for physical and mental well-being. The proportion of Malaysian children under the age of five who were underweight or stunted went from 11.6 and 16.6% in 2011 to 14.1 and 21.8% in 2019, respectively, whereas the proportion of children who were overweight/obese was 6.4% in 2016 and 5.6% in 2019 (Lee et al., 2022). A survey of children and teens in the US called the National Health and Nutrition Examination Survey (NHANES) found that 16.9% of kids and teens between the ages of 2 and 19 were extremely overweight or obese. From year to year, more and more Malaysian children are becoming overweight or obese. According to the National Health and Morbidity Survey (NHMS, 2015), 11.9% of children under 18 years old are overweight or obese. Children aged five to nine years old had the highest rate of overweight or obesity (14.8%). One study in some kindergartens in Klang Valley, Malaysia, found that 18.4% of kids were overweight or obese. This number was much higher for pre-schoolers. The fact that youth obesity was on the rise was a sign that this problem might worsen in the future (Aslan et al., 2020). Growing data shows that eating habits or childhood patterns are affected by many different personal and environmental factors, such as sociodemographic factors.

2.2.1 Factors of Malnutrition

Aside from the parental's nutritional awareness, nutrition intake is influenced by various other factors. Firstly, socioeconomic status. According to the study, parents with higher socioeconomic status tended to be more attentive to nutrition than parents with lower socioeconomic status. Better access to information, healthcare, and education is

the reason for this. Higher socioeconomic status parents are more likely to have access to healthcare facilities, books, and the internet, which can give them the information and skills they need to give their kids a healthy, balanced diet. Conversely, parents from lower socioeconomic backgrounds could experience various difficulties, including lack of money, education, and access to health care, which could influence their knowledge of and adherence to good nutrition (Halder & Kejriwal, 2016). According to several studies, a higher socioeconomic status is strongly correlated with maternal education. Furthermore, it has been demonstrated that uneducated females are more likely to be malnourished. Girls who experience malnutrition are more likely to develop into mothers who are also undernourished; consequently, they face an increased danger of delivering infants with low birth weight (Khattak et al., 2017).

Secondly, child hunger is the most severe food insecurity, characterised by a household's food shortage to the point where children cannot eat enough to meet their daily needs for energy and nutrients. Malnourished children were 16 times more likely to live in households with food insecurity at the child hunger level, according to the study. This highlights the need to tackle food insecurity and ensure that kids have access to an adequate amount and quality of food to fulfil their dietary requirements (Wong et al., 2014).

Thirdly, education and awareness. The study's findings on education and awareness revealed that parents' education and awareness are crucial to the child's optimal physical, cognitive, and social development and academic growth. It was discovered that parents who had completed more education had greater nutritional awareness than parents who had not completed as much schooling. Educated parents can acquire the information and abilities to give their kids a healthy, balanced diet. The

parents' nutritional knowledge and appropriate education are crucial for the child's healthy development.

Parents must receive health, nutrition, and hygiene education early to benefit future generations and themselves (Halder & Kejriwal, 2016). A study in Kuala Langat, Selangor, showed that maternal employment status, perceived child weight status, food restriction, and eating pressure were all associated with the BMI-for-age of children. Therefore, mothers should be educated on proper nutrition practices to assist younger children in maintaining a healthy BMI for age (Aslan et al., 2020).

Next are cultural and social norms. Some parts of India have a superstitious notion that milk curds hinder growth, and others believe that bananas cause convulsions. As a result, a kid may not be given either food. There are areas of Nigeria's Edo Delta where children are not allowed to eat meat or eggs. They contend that these necessities are pricey and that if kids are raised on them, they will grow up to steal to feed their expensive eating habits (Onyesom et al., 2008).

Another factor is an unhealthy household environment. Poor sanitation, a lack of access to clean water, and insufficient hygiene practises are just a few of the issues that affect this factor. Poverty can also impact this factor since it can reduce the resources available to purchase the items and services necessary to maintain appropriate hygiene, health, and well-being (Tette et al., 2015).

Lastly is the health status factor. The study in Terengganu, Malaysia found that low birth weight, recurrent illnesses (including fever, diarrhea, and flu), and a history of worm infection were important risk factors for malnutrition in children. A drop in appetite coincides with a reduction in the amount of nutrients absorbed by the body from the intestines when someone has diarrhea. This is in addition to the elevated metabolic

rate that is caused by the fever, and all of these factors combine to cause weight loss. In the current study, a percent of children had a history of having frequent episodes of diarrhea (Jamro et al., 2012). Children who were underweight at birth and those who were sick frequently were also more likely to be malnourished. According to the study, low birth weight was present in 25% of cases (malnourished children) compared to just 5.1% of controls (children who were not malnourished). This indicates a strong correlation between low birth weight and childhood malnutrition in Terengganu, Malaysia (Wong et al., 2014).

2.3 Nutrition Needs of Children

Stunting and underweight in children were associated with inadequate nutritional intake. While a high-calorie intake by itself does not always equate to good bone growth and good height gain, it is crucial to achieve minimum meal frequency and minimum dietary diversity (Lee et al., 2022). The required nutrition needs for children are protein, iron, iodine, vitamin A, vitamin D, calcium, zinc, vitamin b12 and vitamin C (Branca et al., 2015). First, protein is necessary for the body's maintenance and repair of tissues and growth and development. Age, sex, and physiological state all influence protein requirements, which are typically higher throughout times of growth, including infancy, youth, and adolescence, as well as during pregnancy and lactation.

Many foods, including plant-based foods like legumes, nuts, and seeds, as well as animal items like meat, fish, and dairy, can provide you with protein. A range of protein sources should be consumed to guarantee that all required amino acids are adequately ingested (Branca et al., 2015). Second, iron is necessary for the immune system to work properly and to synthesize hemoglobin, which carries oxygen in the blood. Many foods, including plant-based foods like legumes, fortified cereals, leafy green vegetables, and animal items like red meat, chicken, and fish, can provide you with iron. To improve iron

absorption, eating a range of foods high in iron and foods high in vitamin C at the same time is crucial. This is because the bioavailability of iron from plant-based sources is typically lower than that from animal-based ones (Branca et al., 2015).

Third, iodine is required for thyroid hormone production, which regulates metabolism and growth. Iodine insufficiency is a major public health issue in many parts of the world, particularly in areas with low iodine levels in soil and water. Iodized salt is a simple and efficient technique to maintain enough iodine intake, as is eating iodine-rich foods like fish and dairy products (Branca et al., 2015). Next, vitamin A is required for proper vision, immunological function, and growth and development. Vitamin A insufficiency is a major public health issue in many regions worldwide, particularly in low-income countries. They eat a diet high in vitamin A-rich foods like liver, eggs, and dairy products and foods high in beta-carotene, a precursor to vitamin A, such as orange and yellow fruits and vegetables (Branca et al., 2015).

Vitamin D is necessary for bone health because it aids calcium and phosphorus absorption. Vitamin D deficiency is a widespread concern in many parts of the world, especially in locations with minimal sun exposure or where cultural practises restrict sun exposure. The body may create vitamin D by consuming foods high in the vitamin, such as fatty fish, egg yolks, and fortified meals, and by getting enough sun exposure (Branca et al., 2015). Meanwhile, calcium is necessary for bone health, muscular function, and nerve transmission, and it is especially crucial during growth and development stages. Children should eat a diet rich in calcium-rich foods such as dairy products, leafy green vegetables, and fortified meals since they have high calcium requirements (Branca et al., 2015).

Then, zinc is required for normal growth and development, immunological function, and wound healing. Children can obtain zinc from several meals, including meat,

fish, whole grains, and legumes (Branca et al., 2015). Next, vitamin B12 is required for red blood cell creation, neuron function, and DNA synthesis. Children can get vitamin B12 from animal products like meat, fish, dairy and fortified meals like morning cereals. A balanced diet provides adequate vitamin B12 for children, and vitamin B12 supplements may be required in specific instances, such as in children who follow a vegetarian or vegan diet or who have restricted access to animal products (Branca et al., 2015). Finally, vitamin C is a vital component that aids immune function, wound healing, and iron absorption. Vitamin C is present in many foods kids can eat, such as citrus fruits, berries, kiwi, tomatoes, and peppers. But many kids don't receive enough vitamin C, especially those without access to fresh produce (Branca et al., 2015).

2.3.1 Complications of Malnutrition

In developing countries, food problems have mostly been about the health effects of poor nutrition for the past two hundred years, especially stunting and wasting in children (Chan, 2017). Well-balanced food is important to ensure their growth and development. It is particularly important to emphasise the importance that parental nutritional awareness plays in providing adequate nutrition to preschool children, even when there is a restricted supply of food (Halder & Kejriwal, 2016). In addition to causing delayed cognitive development, malnutrition can increase the risk of infection and mortality, which in turn contributes to low adult incomes, sluggish economic growth, and intergenerational poverty transmission.

Children who are malnourished have a compromised immune system, making them more susceptible to fatalities caused by prevalent illnesses like malaria, respiratory infections, and diarrheal diseases. Compared to healthy neonates, those born with low birth weight and intrauterine growth retardation are more susceptible to morbidity,

mortality, and various forms of malnutrition. Additionally, they have a higher propensity to develop chronic diseases such as hypertension and diabetes as adults (Tette et al., 2015).

Diabetes is a prevalent chronic condition found in children, and since the COVID-19 pandemic, various studies have documented an increasing frequency of diabetes types 1 and 2 in children (D'Souza et al., 2023). Diabetes was divided by the WHO into three groups in 1985: insulin-dependent, insulin-independent, and malnutrition-related diabetes (MRDM). Eventually, MRDM was split into two more groups, which were later named Fibro calculous pancreatic DM and Protein deficient DM (Haftu et al., 2020).

Obesity, a form of hunger caused by too much body fat, is linked to type 2 diabetes mellitus (Temneanu et al., 2016). Complications like ketoacidosis, diabetic sores, amputations, soft tissue infections, and osteomyelitis are less likely to happen when diabetes is strictly controlled. (Yashi & Daley, 2023). Children who are at high risk for diabetes are much less likely to get it if they lose weight. Children who made small changes to their lifestyle, like losing 5 to 10 percent of their starting weight and working out at least 150 minutes a week, had a more than 50 percent lower risk of getting diabetes. Early screening for obesity and extensive treatment can help children with the disease improve or go away for good (Yashi & Daley, 2023).

Another nutritional complication is hypertension. The incidence of hypertension in preschool children who are undernourished or have recovered from undernutrition was found to be greater compared to the control group (Azupogo et al., 2020). In the context of school-based screenings, it was observed that the prevalence of hypertension was three times higher among obese adolescents compared to their non-obese counterparts (Falkner & Lurbe, 2020). It was revealed that children experiencing undernutrition exhibited elevated levels of diastolic blood pressure. Furthermore, it is proposed that the presence of intrauterine undernutrition and undernutrition during childhood may impact the

prevalence of hypertension in adulthood (Mphahlele et al., 2020). Childhood malnutrition is associated with an elevated risk of morbidity and mortality in the paediatric population.

There is a strong likelihood that an early nutritional insult has a significant impact on the increased morbidity and mortality associated with hypertension and its subsequent complications in adulthood (Tennant et al., 2014). Emerging data link overweight and obesity, nutrition, poor physical exercise, excessive screen time, and sleep disturbances to high blood pressure in youth (Falkner & Luber, 2020). Consequently, at the earliest phases of human development, efforts should be made to prevent childhood obesity and its associated complications (Falkner & Luber, 2020). Dietary patterns and quality are crucial in the development of hypertension in children. Dietary factors that are correlated with elevated blood pressure in kids include a diet high in sodium, low in potassium, and heavy on sugar-sweetened beverages (Falkner & Luber, 2020).

2.3.2 Screening for Malnutrition

It is crucial to conduct malnutrition screenings on children due to the severe physical and cognitive development risks associated with malnutrition. There is an increased susceptibility to illness, stunted growth and development, and poor academic achievement among children who are malnourished. These adverse effects can be averted, and a child's general health and well-being can be enhanced through the timely detection and management of malnutrition (Wong et al., 2014).

Nutrition screening systematically identifies babies and children who exhibit risk factors or concerns linked to nutrition to initiate appropriate interventions to address these issues (Ministry of Health, Malaysia, 2018). The nutrition screening process encompasses a range of functions, requirements, and advantages. Nutrition screening and assessment include the gathering of initial data within one or more categories such as anthropometric parameters, clinical (medical history and diagnosis), bio-chemical laboratory data, diet

history, developmental feeding skills, behavior (related to feeding) and socio-economic characteristics (Ministry of Health, Malaysia, 2018).

The primary aim of diet assessment is to gather comprehensive data regarding the child's dietary intake, including factors such as medication consumption, appetite levels, feeding difficulties, food texture preferences, and other aspects related to feeding practises (Ministry of Health, Malaysia, 2018). Meanwhile, the anthropometric measurements commonly assessed during nutrition screening and evaluation involve length/height, weight, and body mass index (BMI). In this study, anthropometric measurements will be used to determine the nutritional status of preschool children (Ministry of Health, Malaysia, 2018). The Body Mass Index (BMI) may not possess sufficient sensitivity in accurately assessing body fatness among children and adolescents with extreme height deviations or atypical body fat distribution patterns. There is also a possibility of misclassifying children and adolescents with well-developed musculature. In individuals below eighteen, the body mass index (BMI) is a dynamic metric that changes from infancy until adulthood.

Additionally, it demonstrates variations in values between males and females and among diverse populations. During the developmental stage of childhood, there is a significant variation in the Body Mass Index (BMI) as it progresses with age. The median body mass index (BMI) at birth is recorded to be as low as 13 kg/m2. This value gradually increases to 17 kg/m2 by the age of 1 year, then decreases to 15.5 kg/m2 at 6. Subsequently, a further increase in BMI to 21 kg/m2 is increased by the time individuals reach 20 years of age. Therefore, it is necessary to establish a certain age limit to characterise child obesity. This can be achieved by employing the same method across several age groups, such as utilising reference centiles.

The identification of overweight and obesity in the United States is commonly determined by utilising the 85th and 95th centiles of BMI for age and sex. These specific cut-off values are derived from nationally representative survey data and are widely recommended for this purpose (Ministry of Health, Malaysia, n.d). Children are underweight if their BMI is below the 5th percentile for age, gender, and height. Next, normal weight is BMI above the 5th percentile and below the 85th percentile for age, gender, and height. Overweight is a BMI above 85th percentile but below 95th percentile for age, gender, and height. Finally, obese BMI is above the 95th percentile for age, gender, and height (CDC, 2022; MOH, 2024).

2.4 Parental Nutritional Awareness of Preschool Children

If obesity is established throughout childhood, it will probably endure into adolescence and maturity. Furthermore, there is a significant correlation between parental overweight/obesity and the increased susceptibility of children to develop the same condition. This can be attributed to the home environment's influential role in shaping children's habits and behaviors. Considering the increased challenges associated with modifying health behaviours in the later stages of life, it is imperative to cultivate healthy habits from the early developmental years (Karmali et al., 2020).

Parents have a significant impact on their children's health, behaviour, and education; through their own beliefs, food practises, perspectives, eating attitudes, knowledge, and understanding of the health benefits of food and nutrients, they establish food environments and shape their children's initial encounters with food and eating (Romanos-Nanclares et al., 2018). Parents who know about healthy foods may be more likely to feed their kids healthy foods, but parents who eat healthy foods themselves may also affect how much their kids eat healthy foods like fruits and vegetables. Research

supports the idea that parents can help their kids stay at a healthy weight by setting a good example. Parents who eat well, exercise, and can make changes to their diet are more likely to have kids who are at a healthy weight. In addition, the food choices that the parents make tend to affect the foods included in the supper meal for families that dine together (Weiss, 2016).

Providing nutrition education and counseling to parents, promoting healthy eating practises through community-based programmes, and expanding access to healthy food options are all methods for increasing parental nutritional awareness. Healthcare providers may also contribute to parental nutritional awareness by offering guidance and resources regarding the significance of a balanced diet for children's growth and development and healthy eating practises (Halder & Kejriwal, 2016). A supporting study shows a link between how healthy parents eat and how much food their kids eat. One example is that kids whose parents eat fruit juice, veggies, low-fat foods, and fat substitutes tend to eat less fat. Studies have shown that kids who liked fruits and veggiesate more of them.

Researchers have found a link between parents who serve fruits and veggies at home for lunch and dinner and their children eating more fruits and vegetables. In the same way, almost 90% of children eat veggies at home when vegetables are served at meals, but only 50% of children eat vegetables when vegetables are not served at meals. More studies has shown that parents who know about healthy foods are more likely to feed their kids healthy foods (Weiss, 2016). A study in Saudi adds that knowledge can be the most powerful tool in the fight against malnutrition. To help parents become more aware of nutrition, the report suggests a National Nutrition Day and school nutrition meetings (Sultana, 2017).

Proper education and nutritional awareness of the mother play an important role in the child's proper development (Halder & Kejriwal, 2016). A studies by Shahid et al., among mothers fro rural households, shows no significant relationship between the level of education and parental nutritional awareness (Shahid etal., 2022). Poor nutritional awareness and education of others have been identified as one of the major causes of child malnutrition in many studies (Shahid et al., 2022). Besides that, children with a low family income were significantly more malnourished than those with a higher monthly faily income (Bashir et al., 2021). Higher family income improves awareness of children's nutrition by enabling access t better food, healthcare and educational resources. Furthermore, studied by Halder & Kejriwal, reported tat previous study established a strong association between gchildren's BMI and parental nutritional awareness. Ther previous study also concuded that the more a mother knows about heath and nutrients, the better the overall quality of their children's diet (Halder & Kejriwal, 2016).

2.5 Theoretical and Conceptual Framework

The Health Belief Model (HBM) was used to determine what habits are good for health. The theoretical basis for this study has been chosen as this model. The Health Belief Model (HBM) was created in the 1950s by a cohort of social psychologists, Irwin M. Rosenstock, Godfrey M. Hochbaum, S. Stephen Kegeles, and Howard Leventhal, who were based in the United States. Over the years, this model has been improved and used to explain health-related behaviour.

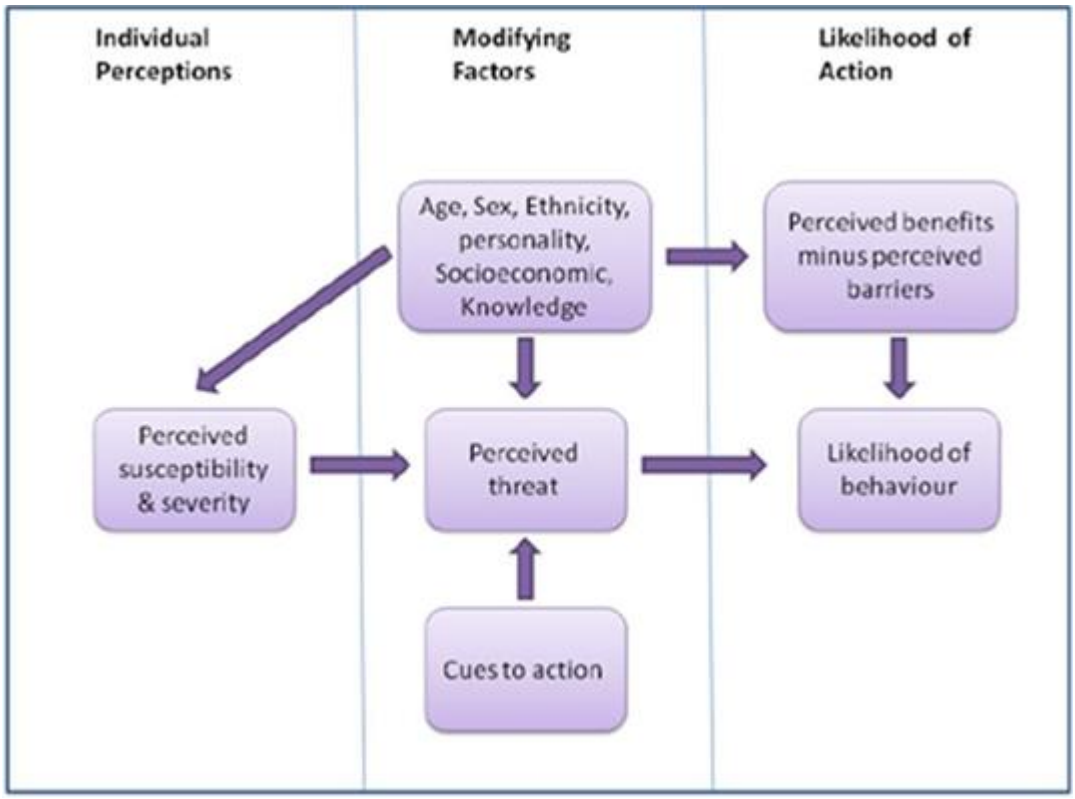

Figure 2.1 The Health Belief Model adopted from Glanz, Rimer & Lewis (2002)

The HBM is made up of four parts: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. These are the four parts that make up the model as a whole. It says that people will take steps to avoid getting sick if they think they are more likely to get sick and if they think they are more sensitive to illness. Part of the perceived severity of a condition is how people think it might affect them and how

bad they think it might be. People are also more likely to change their behaviour if they think that a certain action will lessen the likelihood or severity of an event or lead to other good results. All of these things are called "perceived benefits." Regarding the perception of a barrier, people have limited negative associations with the proposed health activity that they believe would stop the intended behaviour change.

It has been thought that risk susceptibility, which is what the model calls perceived risk, is a big part of understanding health-related behaviours. The ideas that have come out of behavioural and social science give us a framework for figuring out why people do things that are either good for their health or bad for it. To this end, making theories and then using them is a good way to learn about what makes people start or keep healthy habits, especially when used to plan, carry out, and evaluate health promotion programmes. Individual, family, social, and cultural factors are just a few of the many types that come into play when looking at the factors that affect participation in health promotion practises.

Using the HBM, this study explores modifying factors, which are socio demographic factors that include parents' age, race, religion, marital status, level of educational, job, household income, number of children, children's age, children's gender, children's height and weight and parental nutritional awareness of their preschool children at private preschools in Taman Scientex, Pasir Gudang, Johor. The study focuses on understanding how parental awareness and knowledge about nutrition influence their perceptions of the likelihood of nutritional issues for their children. Consideration is given to factors such as level of education, household income and their role in shaping parental perspectives.

The study aims to ascertain whether parents perceive knowledge about nutrition as beneficial and comprehend its impact on their caregiving practices. Additionally, an investigation will be conducted into the challenges faced by certain parents, such as constraints in time or finances, and an exploration of the confidence levels parents experience in making health-conscious choices. This comprehensive analysis aims to provide insights into the determinants influencing parental approaches to nutrition within this community.

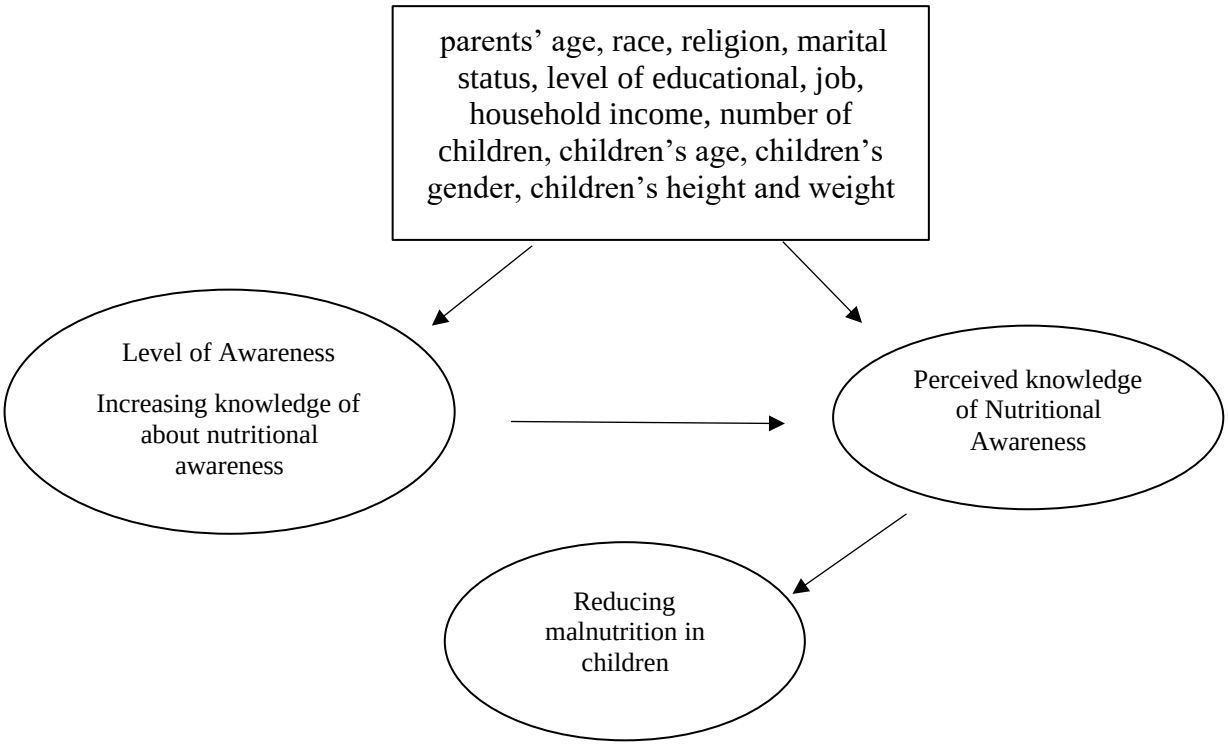

Figure 2.2 Conceptual framework of the study for parental nutritional awareness of their preschool children

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Study Design

The study used a cross-sectional study design. The participants were selected based on the inclusion and exclusion criteria set for the study. The selected participants were following te study to assess parental nutritional awareness level as well as the association of selected sociodemographic characteristics with the participants' nutritional awareness level. The advantages of cross-sectional study include do not require a lot of time, being inexpensive, and can be carried out at a one-time point or over a short period (Setia, 2016).

3.2 Study Location

This study was conducted at private preschools in Taman Scientex, Pasir Gudang, Johor, focusing on parents to gauge their nutritional awareness and its impact on their children's health. Pasir Gudang, an industrial city in Johor Bahru, covered 146 square kilometers and offered extensive facilities, including industrial parks, a major port, educational institutions, and healthcare services. Taman Scientex, an urban area within Pasir Gudang covering approximately 1,100 acres (about 4.45 square kilometers), was characterized by well-planned housing and modern amenities. The choice of private preschools was driven by the ease of obtaining respondents, as these institutions often had more flexible administrative processes and more engaged parents, which could lead to higher-quality data. The urban setting of Taman Scientex, combined with Pasir Gudang's developed infrastructure, provided an appropriate context for this study.