



**UNIVERSITI PUTRA MALAYSIA**

***ASSOCIATION OF SOCIO-DEMOGRAPHIC BACKGROUND  
AND HOME FOOD ENVIRONMENT WITH BODY WEIGHT  
STATUS AMONG PRIMARY SCHOOL STUDENTS IN BANGI,  
MALAYSIA***

**RINA SYAHIRA BINTI RATHUAN**

**FPSK(m) 2022 7**



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**By**

**RINA SYAHIRA BINTI RATHUAN**

**Thesis Submitted to the School of Graduate Studies, Universiti Putra  
Malaysia, in Fulfillment of the Requirements for the Degree of Master  
of Science**

**March 2021**

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment  
of the requirement for the degree of Master of Science

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By

**RINA SYAHIRA BINTI RATHUAN**

**March 2021**

**Chairman: Nurzalinda Binti Zalbahar, PhD**  
**Faculty: Medicine and Health Sciences**

Childhood obesity and undernutrition is a global epidemic issue. Home food environment is an important aspect that may influence children's body weight status. The aim of this study is to identify the association between socio-demographics and home food environment (HFE) with body weight status in primary school students in Bangi, Malaysia. There were 398 children (43.5% males and 56.5% females) aged 7-11 years old (mean age of  $9.04 \pm 1.41$  years) and their parents (66.6% mothers and 33.4% fathers) from eight randomly selected primary schools participated in this study. Parents were asked to complete a self-administered questionnaire on socio-demographic background, feeding practices and food availability. For standard one to three, children were interviewed to obtain information on parenting styles and physical activity level, while for standard four to five, the questionnaire was self-administered with the help of researcher in the class. Weight and height of the children were assessed, and BMI-for-age z-score (BAZ) was calculated by using WHO Anthroplus Software. Overweight and obesity prevalence was 17.8% and 13.1% respectively. Whereas, prevalence of thinness and severe thinness was 3.8% and 0.2% respectively. A majority of the parents (61.3%) in this study practiced authoritative parenting style. An increasing age is found to lead to an increase in children's BMI. While, female students were observed to have a lower BMI compared to male. Parent's increasing restriction for weight control ( $\beta=0.22$ ,  $p<0.05$ ) and decreasing pressure to eat ( $\beta=-0.19$ ,  $p<0.05$ ) increased childhood overweight and obesity risk. This study emphasizes the importance of involving parents in the weight intervention programs for children. Future longitudinal studies are necessary to explore the association of home food environment factors and children's weight status.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

**PERKAITAN ANTARA LATAR BELAKANG SOSIO-DEMOGRAFI DAN PERSEKITARAN MAKANAN DI RUMAH DENGAN STATUS BERAT BADAN DALAM KALANGAN PELAJAR SEKOLAH RENDAH DI BANGI, MALAYSIA**

Oleh

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Kegemukan dan kekurangan zat makanan kanak-kanak adalah masalah wabak global. Persekitaran makanan di rumah adalah aspek penting yang boleh mempengaruhi status berat badan kanak-kanak. Tujuan kajian ini adalah untuk mengenal pasti perkaitan antara sosio-demografi dan persekitaran makanan di rumah (HFE) dengan status berat badan pada pelajar sekolah rendah di Bangi, Malaysia. Terdapat 398 kanak-kanak (43.5% lelaki dan 56.5% perempuan) berumur 7-11 tahun (min umur  $9.04 \pm 1.41$  tahun) dan ibu bapa mereka (66.6% ibu dan 33.4% bapa) dari lapan sekolah rendah yang dipilih secara rawak mengambil bahagian dalam kajian ini. Ibu bapa diminta melengkapkan soal selidik yang dikendalikan sendiri mengenai latar belakang sosio-demografi, amalan makan dan ketersediaan makanan. Untuk standard satu hingga tiga, kanak-kanak ditemu ramah untuk mendapatkan maklumat mengenai gaya keibubapaan dan tahap aktiviti fizikal, sementara untuk standard empat hingga lima, soal selidik itu dikendalikan sendiri dengan bantuan penyelidik di kelas. Berat dan tinggi badan kanak-kanak dinilai, dan skor BMI-untuk-usia (BAZ) dikira dengan menggunakan WHO Anthroplus Software. Berlebihan berat badan dan obesiti masing-masing adalah 17.8% dan 13.1%. Manakala, kurus dan kurus teruk masing-masing 3.8% dan 0.2%. Sebilangan besar ibu bapa (61.3%) dalam kajian ini mengamalkan gaya keibubapaan autoritatif. Semakin meningkat usia didapati menyebabkan peningkatan BMI kanak-kanak. Sementara, pelajar perempuan diperhatikan mempunyai BMI yang lebih rendah berbanding lelaki. Peningkatan had ibu bapa untuk mengawal berat badan ( $\beta=0.22$ ,  $p < 0.05$ ) dan penurunan tekanan untuk makan ( $\beta=-0.19$ ,  $p < 0.05$ ) meningkatkan risiko berlebihan berat badan dan kegemukan kanak-kanak. Kajian ini menekankan pentingnya melibatkan ibu bapa dalam program intervensi berat badan untuk kanak-kanak. Kajian membujur pada masa depan diperlukan untuk meneroka kaitan faktor persekitaran makanan di rumah dan status berat badan kanak-kanak.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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## Declaration by Members of Supervisory Committee

This is to confirm that:

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- supervisory responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2015-2016) are adhered to.

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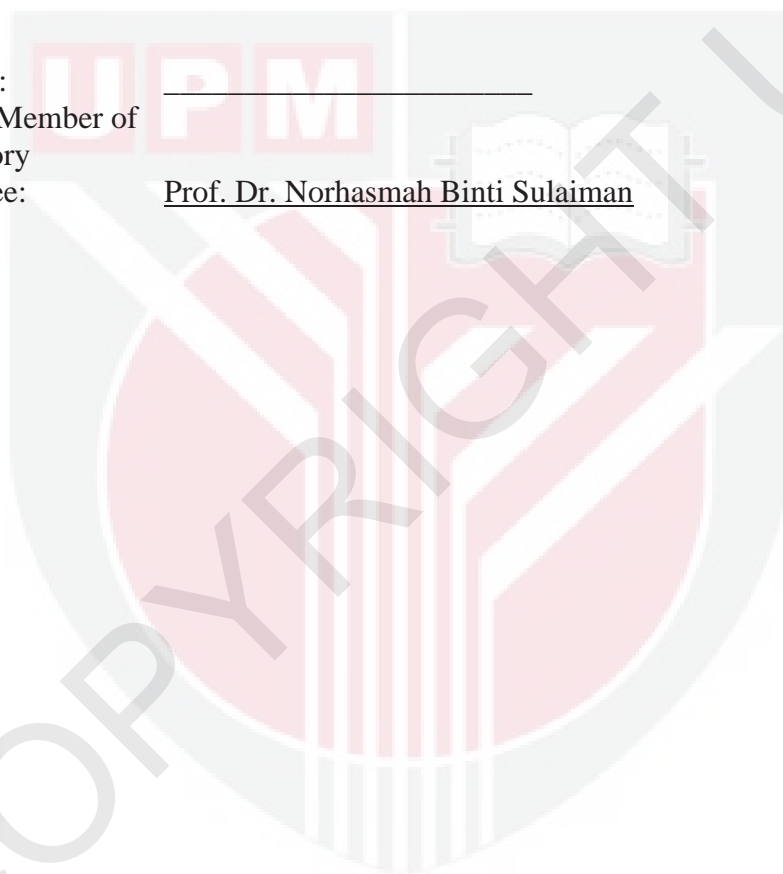
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## LIST OF ABBREVIATIONS

BAZ	BMI-for-age z-score
BMI	Body Mass Index
CFPQ	Comprehensive Feeding Practice Questionnaire
DASH	Determinants of Adolescent's Social Well-being and Health
HFE	Home Food Environment
NCHS	National Center for Health Statistics
NHMS	National Health and Morbidity Survey
PAQ	Parental Authority Questionnaire
WHO	World Health Organization

# CHAPTER 1

## INTRODUCTION

### 1.1 Background of the study

The children's nutritional status measures the extent to which nutrients are fulfilled physiologically (IPH, 2020). It represents the balance between nutrient intake and the individual usage or need for nutrients (IPH, 2020). Being underweight, overweight, or obese is harmful to children's health (Dong et al., 2018). The focus on young people is important, as this is a critical stage in life when young people are most vulnerable to events that change their lives with a lasting effect (Higgins, 2013). Early intervention can reduce the risk of malnutrition and lifestyle illnesses over the entire lifetime of a person.

Obesity is a term that refers to an abnormally or excessive body fat build-up in adipose tissue (WHO, 2020). Obesity is linked to an increased incidence of morbidity and mortality (Abdelaal et al., 2017). Childhood obesity is growing globally with around 38.3 million children under the age of five were reported to be overweight in 2019 (WHO, 2020). According to Twig et al. (2016), more studies are leading to believe that childhood obesity and weight problems may have a significant impact on cardiovascular issues and there were about 70-80 percent chances that childhood obesity will remain into adulthood and this has become a concern to the public. Obesity affects the health of children with what used to be adult diseases, resulting in various health problems such as atherosclerosis, metabolic syndrome, type II diabetes, dyslipidemia, obstructive sleep apnea, insomnia, and non-alcoholic fatty liver disease (Gupta et al., 2012).

While a lot has been established about the epidemic of childhood obesity, especially in developing countries, there is also a serious problem with children who are too thin. According to World Health Organization (2020), malnutrition refers to problems with nutrition including deficiencies, excesses, or imbalances in the amount of energy and nutrients received. The term "underweight" refers to children who are low weight for their age. An underweight child may be both stunted and wasted (WHO, 2020). According to National Health and Morbidity Survey (NHMS), the national prevalence of underweight children aged 5 to 17 years old was 15.4% (IPH, 2019). Malnourished children, especially those who are significantly underweight, are associated with a broad range of developmental and cognitive impairments as well as mortality (Dong et al., 2018).

The aetiology of obesity is not only associated to childhood's behaviour but increasingly being related to social and economic trends and policies in agriculture, transportation, urban planning, the environment, food production, distribution, and marketing, as well as education (WHO, 2018). Some other factors were socio-



demographic background, perceptions, and understanding of excessive energy intake and minimal exercise which in turn contributed to childhood obesity (Mabiala Babela et al., 2016). While, in general, poor socioeconomic conditions, poor maternal health and nutrition, regular diseases, and/or improper early childhood nutrition and childcare are usually associated with undernutrition issues (WHO, 2020). In recent years, findings have centered on the role of parents with respect to the development and prevention of childhood obesity and undernutrition problems (Sahoo et al., 2015). Despite the development of fast food and the increased trend of eating outside home, approximately two-thirds of the food they eat is from home, which resulting in the home environment of a crucial setting that may affect the children's weight status (Nepper, 2016). In particular, parents play a part in children's lives, shaping their understanding of food and decisions as health promoters, role models, and educators (Yee et al., 2017).

Home food environment (HFE) is defined as the healthiness of food presence at home which affects the diet of children and their BMI (Ding et al., 2012). HFE was developed by parents and characterises a child's food environment that supports or hinders healthy eating (Scaglioni et al., 2018). Findings of home food environment reported that home food environment highly influences a child's eating development (van Ansem et al., 2014). According to Ventura & Birch (2008), a home food environment was created by parents of children with the role of making certain food available or unavailable, making rules about food, using positive reinforcement in their home, and modeling healthy dietary behaviours. Hence, parents were influenced by a broad environment and sociocultural factors which then affect the environment of a child such as parental feeding practices, parenting style and knowledge, and physical environment such as food availability at home, and socio-demographic variables such as ethnicity, and family income (Scaglioni et al., 2018).

Initiatives aimed at changing 'obesogenic' behaviour and obesity development through environmental changes have been highly focused on home food environment, as compared to school and neighbourhood influences, and is a key condition in which children's eating start popping up (Johnson et al., 2012; Rosenkranz & Dzewaltowski, 2008). Based on the ecological niche, parents impose sociocultural values and practices around eating and food practices within the home food environment (Boswell et al., 2019). For example, interpersonal influences such as parental use of control practices have been linked to increased children's body weight and tendencies to obesogenic eating behaviour (Leiu & Chin, 2019; Nordin et al., 2018). In the same way, the type of food consumed at mealtimes and the accessibility of fruit and vegetables have been linked to increased obesity (Wheaton et al., 2015).

According to Couch et al. (2014), the home food environment consists of physical aspects and social aspects that shape children's weight status and food intake. Social aspects such as parenting practices and styles while, the physical aspect such as food availability. The interplay between social aspects and physical aspects has been linked with children's weight status in earlier studies (Couch et al., 2014; Shloim et al., 2015). The home food environment measured as a variable like parental feeding practices was found to significantly affect various health-related indicators like childhood obesity

and undernutrition issues (Boswell et al., 2019). Other aspects such as parenting style have also been reported to influence children's weight status (Rodgers et al., 2013). Hence, the social aspects (i.e., parenting practices and parenting styles), as well as physical aspects (i.e., food availability) represent a crucial value of one's home food environment and were selected as measures for this study.

## 1.2 Problem statement

Data from the World Health Organisation (WHO) have shown that children and adolescence aged between 5 and 19 years old overweight and obesity increased intensely, from only 4% in 1975 to just over 18% in 2016 (WHO, 2020). In 2009, Malaysia is classified as the sixth state in Asia by the World Health Organization (WHO) that has greater obesity prevalence (WHO, 2009). Statistics from the Nutrition Survey of Malaysian Children (SEANUTS Malaysia) stated that obesity children's prevalence in Malaysia was 11.8% (Poh et al., 2013). National Health Morbidity Malaysia (NHMS) found that the prevalence of obesity was shown to rise from 11.9% in 2015 to 14.8% among children under 18 years old (IPH, 2020). Whereas, the prevalence of underweight children also increased from 7.8% to 10.0% in 2019 (IPH, 2020). The focus was on children's weight status because the likelihood of childhood obesity to persist into adulthood increases as the child ages, meanwhile, undernutrition children were more likely to develop physical and intellectual disabilities (Twig et al., 2016; De & Chattopadhyay, 2019).

Childhood obesity and childhood undernutrition prevention efforts have largely targeted the influence of the school environment towards children's weight status among primary school children, and it is essential to get an understanding of some other factors, particularly home food environment among Malaysian children (Waters et al., 2014; Tan et al., 2020). A study conducted recently by Tan et al., (2020) among children in Sabah, strategies to tackle undernutrition among children are essential by focusing their interventions on the critical 1000-day window period from conception to the age of two. It is also necessary to emphasise that, without adequate participation and awareness between families, a program will be difficult to succeed. Waters et al. (2014) also emphasize that family and home activities that support children should be more active and consume a variety of nourishing foods as well as spend less on the screen are important strategies to prevent obesity and its co-morbidities.

Many studies were examining parental feeding practices, parenting style, and food availability association with children's weight status (Leiu & Chin, 2019; Yamborisut et al., 2018). For example, it was found that fathers of normal weight (NW) children were practising an authoritative parenting style, greater feeding responsibility, and more monitoring practice compared to fathers of overweight or obese children in Malaysia (Leiu & Chin, 2019). In another study by Nordin et al. (2018), it was found that poor parental feeding such as not monitoring their child eating unhealthy food, not restricting unhealthy food for their child, and failed to serve as an example for their children may lead to an increase child's BMI. While there were many shreds of evidence obtained from Western countries, according to Yang et al. (2017), research

for all HFE components included parental feeding practices, parenting style, and food availability with children's weight status is still limited in Malaysia.

Parental feeding practices were included as the main component in this study because the method of feeding used could determine the weight of the child through food intake (Quah et al., 2018). While parents serve a vital role in the nutritional status of their children, the parenting style also has been postulated as influencing the weight of the child (Alahmadi, 2019). Furthermore, food availability was also chosen as the component of the home food environment because the availability of household food determines individual consumption of food and is critical in the case of children (Mat Ya et al., 2017). Home food environment components in this study comprised of parental feeding practices, parenting style, and the physical aspect such as food availability. Physical activity was also included in the study because it could play roles in weight changes among children.

Therefore, the present study is to examine the association between socio-demographic background and home food environment factors with children's weight status involving parental feeding practices, parenting style, food availability as well as physical activity among primary school children. It is essential to highlight the home food environment factors applied by Malaysian parents among primary school children. As a result, this study aimed to fill the gaps on the socio-demographic background and home food environment factors of a community of Malaysian school children associated with body weight status.

The research question addressed in this study is as follow:

- i Are there an association between socio-demographic background and home food environment (HFE) factors with children's weight status?

### **1.3 Objective**

#### **1.3.1 General objective**

To determine the association between socio-demographic background and home food environment (HFE) factors on body weight status among primary school children in Bangi, Selangor.

#### **1.3.2 Specific objectives**

- i. To determine the socio-demographic background (gender, age, ethnicity, parent educational level, household monthly income) of the sample.
- ii. To determine the home food environment (HFE) factors.
- iii. To determine the body weight status of the school children.

- iv. To determine the physical activity level of the school children.
- v. To determine the association of socio-demographic background and home food environment (HFE) factors on body weight status of the children.

#### **1.4 Hypotheses**

There is an association between socio-demographic background and home food environment (HFE) factors with children's weight status among primary school children in Bangi, Selangor.

#### **1.5 Significance of the study**

Obesity and undernutrition were associated with a variety of negative nutritional and health implications in all age groups, including children. We can gain a better comprehension of the underlying causes of the problem by identifying potential risk factors for the increasing prevalence of childhood obesity and malnutrition. The study's findings will add to the body of nutrition information available in Malaysia about children's body weight status.

Parents may influence healthy energy-balance related behaviours in their children and act as role model in promoting these healthy behaviours in the home environment as well as in dealing with various environmental obesogenic factors (Reilly & Kelly, 2010). Moreover, the findings on the prevalence of children's weight status from this study can serve as a baseline for future research aimed at determining childhood obesity and undernutrition and other risk factors. Additionally, it will help in the development of potentially effective preventative strategies targeted at decreasing the prevalence of obesity-related diseases and undernutrition problems among children.

With the lack of knowledge in the appropriate method of feeding practices, the lack of information related to parenting style, lack of understanding the role of fathers and mothers in the behaviour of the children's home food environment and physical activity, it is necessary to find out the home food environment influences to the weight status of a child. With this study, we will have a greater comprehension of the potential risk factors that may contribute to the children's weight status as early as possible. The findings will be used for intervention programs and further research to overcome the growing concerns and gaps of obesity among school children in Malaysia.

#### **1.6 Conceptual framework**

The conceptual framework for this study is illustrated in Figure 1.1. The conceptual framework shows socio-demographic background, home food environment (HFE)

factors, children's physical activity, and body weight status of children. As for the socio-demographic background, child's age, gender, ethnicity, parent educational level, household monthly income might play a role towards children's weight status. Whereas for the home food environment factors, parental feeding practices at home can therefore affect the weight status of the children. A variety of studies provide insight into how a home food environment can shape and improve the diet and weight of a child (Couch et al., 2014). In this study, the parental feeding practices will be evaluated by using a questionnaire.

The figure also describes how parenting style could influence the weight status of children. Thus, the assessment of parenting style perceived by children can help to determine whether or not there is a link between parenting style and children's weight status. In this study, the parenting style perceived by children will be assessed by a questionnaire. The availability of food also determines whether there is an association exists between the weight status of the children with a child's home consumption. This is because, based on how many foods are available and how much they consume at home, the availability of food in the home also may influence children's body weight status.

Furthermore, children's physical activity also was included in the conceptual framework and will be evaluated by a questionnaire. Children's physical activity has been shown to have a beneficial effect on the weight of children. All the variables will be analyzed to determine whether the body weight status of the primary school children was associated with socio-demographic background and home food environment factors. In short, all these variables were hypothesized as factors that may influence children's weight status.



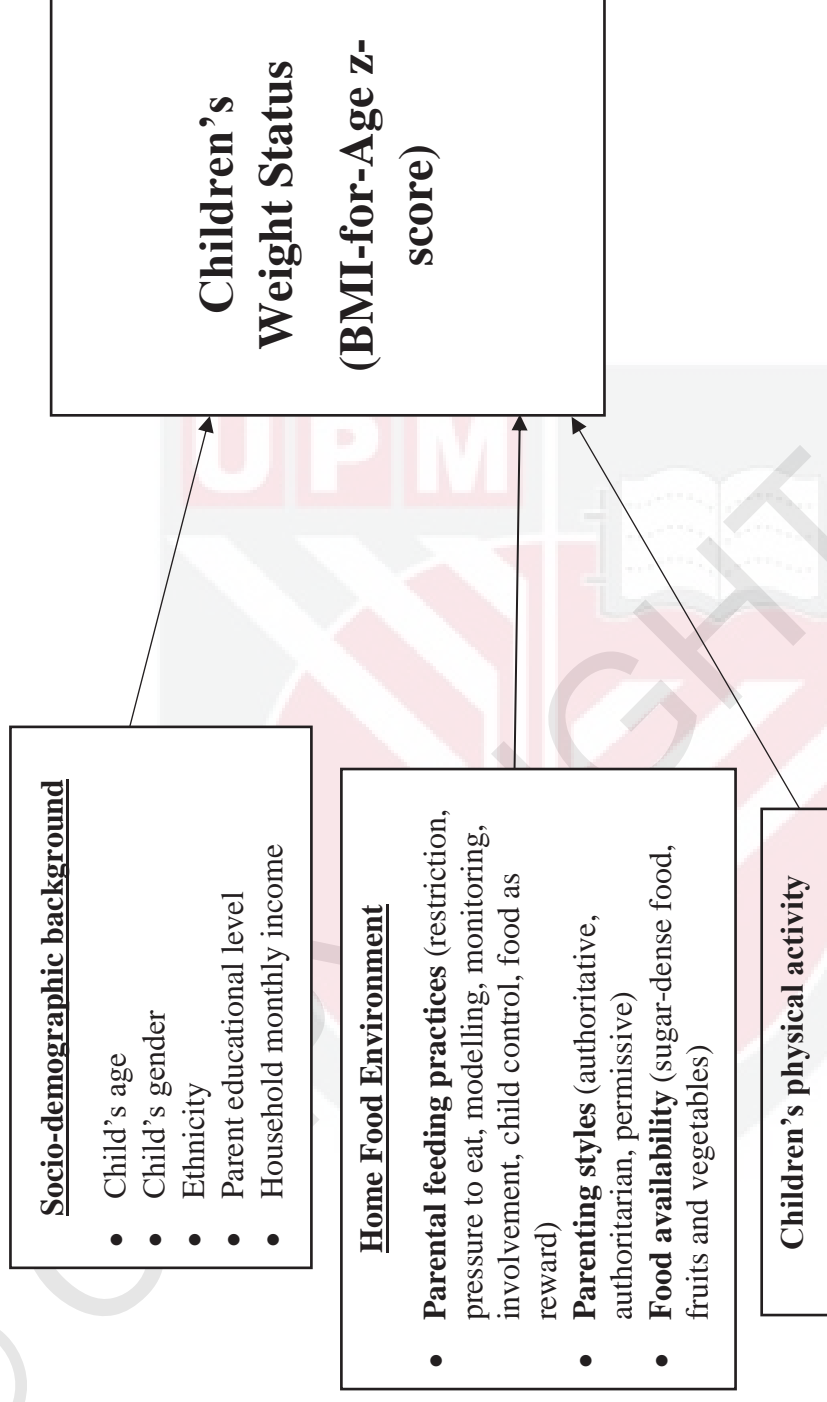


Figure 1.1: Conceptual framework of socio-demographic background and home food environment factors with children's weight status

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