

## ORIGINAL ARTICLE

# Overweight and Obesity Among Children: A Relationship Between Maternal Beliefs and Feeding Practices With Children's Body Mass Index-for-Age in Bandar and Jugra Kuala Langat Selangor

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## ABSTRACT

**Introduction:** Childhood obesity is one of the major public concerns as prevalence was showing an increasing trend in Malaysia. This study aimed to determine the associations between maternal beliefs, attitudes and feeding practices with children's Body Mass Index-for-age (BMI-for-age). **Method:** A cross-sectional study was carried out in Bandar and Jugra, Kuala Langat, Selangor in two-phase. The first phase was conducted to determine the prevalence of children's body weight status involving 209 pairs of mothers and children. The second phase of the study aims to determine the socio-demographic characteristics, maternal beliefs, maternal attitudes and feeding practices with childhood obesity involving 148 pairs of mothers and children whose BMI-for-age are normal, overweight and obese only. A set of self-administered questionnaire was answered by the mothers and anthropometric measurements of children were taken. **Results:** Overall, about 24.9% of the children were overweight and obese. Maternal employment status ( $X^2 = 9.135$ ,  $p < 0.05$ ), perceived child weight status ( $r = 0.267$ ,  $p < 0.05$ ) and food restriction ( $r = 0.186$ ,  $p < 0.05$ ) were positively correlated with children's BMI-for-age. The pressure to eat ( $r = -0.177$ ,  $p < 0.05$ ) was negatively associated with children's BMI-for-age. From multiple linear regression, maternal employment status, perceived child weight status and pressure to eat was shown to be factors associated with children's BMI-for-age. **Conclusion:** In conclusion, the findings showed that maternal employment status, perceived on child weight status, restriction on food and pressure to eat were linked to children's BMI-for-age. Therefore, mothers should be educated on appropriate feeding practices to help to maintain healthy BMI-for-age among younger children.

**Keywords:** Child feeding practices, Overweight, Obesity, Preschool children

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## INTRODUCTION

Globally, childhood overweight and obesity are considered as one of the major public concerns and the prevalence of childhood obesity has been increasing worldwide. Data from the National Health and Nutrition Examination Survey (NHANES) conducted among children in the United States (US) reported that about 16.9% of US children and adolescents aged two to 19 years old were obese and another 14.9% were overweight (1). In Malaysia, the incidence of overweight and obesity among children was increasing from year to year. Based on the reports from the National Health and Morbidity Survey (NHMS, 2015), the overall prevalence

of overweight and obesity among children aged below 18 years old is 11.9% and the highest prevalence among age group was on children aged five to nine years old (14.8%) (2). One study conducted in selected kindergartens in Klang Valley, Malaysia reported the prevalence of overweight and obesity was 18.4% which considerably higher among pre-schoolers. The increasing trend of childhood obesity was a signal to show the possibility of this issue become worse in the future (3).

Childhood obesity can be defined as excessive weight gain which caused the Body Mass Index-for-age (BMI-for-age) falls more than +1SD and above to classify as overweight and obesity (4). Obesity in children was related to many health consequences, including physical's health and psychological development of the children (5). Overweight and obese children are often teased by their peers due to their weight and

physical appearance which actually makes them be less confident and has lower self-esteem (6). Another study also reported the association between childhood obesity and poor academic performance in which obese children usually had more problems in school compared to normal-weight children such as more likely to miss school or being sick too often (7). Other than that, obese children also have a greater risk of developing obesity during their adulthood and increase the risks of having non-communicable diseases such as cardiovascular diseases, type 2 diabetes and others in the future (8). Therefore, it is important to understand and explore the potential factors that can contribute to childhood obesity. Genetics, lifestyle, dietary intake and social factors have been reported to be associated with the incidence of overweight and obesity among young children. A few studies reported that having at least one overweight parent, engaging with a sedentary lifestyle and dietary preferences were shown to be the most consistent risk factors of childhood overweight and obesity (9,10). As children usually observe their parents, parents play a crucial role as being the role model to their children especially in shaping children's behaviour of practising a healthy lifestyle (11).

Mothers play a significant role in their children's body weight status. This was explained as mothers usually act as a primary caregiver in providing, preparing and hold the most responsibilities on children's food intake and their preferences (12). Thus, it is a priority for mothers to understand the strategies and feeding practices that mothers should use when interacting with their children. Maternal misperception and concern on childhood obesity play a bigger role in identifying, preventing and seeking for the treatment of childhood obesity. As mothers believed obesity in children was not a health concern, they might be delayed to seek the treatment and later increase the potential consequences of obesity on their children (13). Using food as a reward, restrict the food intake, excessive pressure and monitoring their children's food intake were the most common feeding practices used by mothers in feeding their children (14). Maternal beliefs and feeding practices acted as an important strategy in shaping healthy eating behaviour among children (15). The significant association of feeding practices on childhood obesity as an important area to study and explore to give a better understanding especially for mothers so mothers will realise their important role as a key in reducing childhood obesity. This study focusing on maternal beliefs, attitudes and feeding practices as every mother has a different approach in feeding their children, thus understanding what mothers perceived and their feeding practices could help to reduce the increasing prevalence of childhood obesity. To date, there were few studies assessing childhood obesity and children's BMI-for-age but most studies focusing more on primary school children. Therefore, this study focus to determine the association of maternal beliefs, attitudes and feeding practices with

children's BMI-for-age among pre-schoolers aged four to six years old.

## MATERIALS AND METHODS

This study was a cross-sectional which conducted in 13 kindergartens located in two mukims which Bandar and Jugra, Kuala Langat, Selangor. These two mukims were randomly selected using a simple random while cluster sampling was used in selecting the kindergartens. Permission and approval to conduct this study were obtained from Jabatan Kemajuan Masyarakat (KEMAS) Kementerian Pembangunan Luar Bandar, Selangor and Kuala Langat district and the Ethics Committee for Research Involving Human Subject of Universiti Putra Malaysia (Reference number: JKEUPM-2017-222). Since the study was involving both mother and children, two different sets of information and consent forms were distributed to the respondents. The inclusion criteria of this study are those children aged ranged from four to six years old being care for by his or her mothers. Children with any physical disabilities including amputation in any parts of the body, deaf and unable to speak were excluded from this study.

The sample size of this study was determined using the correlation sample size formula by Hulley, Cummings, Browner, Grady, & Newman (2007) which then plus with 20% dropout rate (16). The calculation of sample size using this formula was applied to the first phase of the study which after calculated, the final sample size was 209 subjects. The main focus of this phase was to determine the prevalence of children's body weight status; severe thinness, thinness, normal, overweight and obesity among pre-schooler children in Bandar and Jugra, Kuala Langat, Selangor. For the second phase of the study, the aim was to study the association of childhood overweight and obesity with maternal beliefs, attitudes and feeding practices thus only 148 subjects were included in this phase. During this phase of the study, we excluded those children with severe thinness and thinness weight status and involved those with normal, overweight and obesity only. The possible explanation in involving children with normal and exclude children with severe thinness and thinness because normal children have a higher chance of being overweight and obese compared to those two groups of weight status (17).

## Questionnaire

The questionnaire used in this study were divided into two different parts. The first part of the questionnaire was used to obtain the socio-demographic backgrounds of mother and children including mother's educational level, employment status, children's age, gender, birth weight and other information. The second part of the questionnaire was used to measure the maternal beliefs, attitudes and child feeding practice using Child Feeding Questionnaire (CFQ) developed by Birch et al. (2001)

(19) .CFQ is commonly used to assess child feeding in relation to maternal beliefs, attitudes and feeding practices focusing on obesity proneness in children. In CFQ, there are 31 questions with seven domains and can be classified into two categories; maternal beliefs and attitudes related to child's obesity proneness and the second are maternal practices regarding feeding practices (18). Four domains were falling in the first category which is perceived feeding responsibility (3 items), perceived mother's weight status (4 items), perceived child weight status (6 items) and maternal concern on child weight status (3 items). The remaining three domains were categorized in the second category consists of food restriction (8 items), pressure to eat (4 items) and food monitoring (3 items). The CFQ was validated on parents in Pennsylvania and Colorado with the internal consistencies of all seven domains being above 0.70 (19). All the questions were answered by mothers and their responses were graded using a five-point Likert scale. A higher mean score in each domain indicates higher levels of maternal beliefs and attitudes and higher control in feeding practices respectively. In this study, the translated and validated version of Malay language was obtained from a study conducted among pre-schoolers in Peninsular, Malaysia with the internal consistencies for all domains ranged between 0.50 to 0.70 (19).

### Anthropometric measurements

Anthropometric measurements of children which are height and weight were taken by the researcher. A standard procedure was followed in measuring children's weight and height by using a TANITA Digital Scale Model HD-309 (Tanita Corporation, Tokyo, Japan) and a SECA body meter (SECA 208, Germany), respectively. Both measurements were taken for at least twice by the researchers to get the average value. Then, Body Mass Index-for-age (BMI-for-age) of the child was calculated and classified based on their body weight status. The BMI-for-age was classified based on the categories proposed by WHO Growth Reference (2007) developed by World Health Organization (WHO) in 2007 that served as a standard reference in categorized the children's BMI-for-age as shown in Table I (4).

### Statistical analysis

Statistical analysis of the data was performed using the IBM Statistics Package of Social Sciences System (SPSS) version 22.0. Frequency and percentage were used to present the categorical data while mean and standard

**Table I: Classification of children's BMI-for-age**

Classification	BMI-for-age (z-score)
Severe thinness	<-3 SD
Thinness	≥ -3 SD to < -2 SD
Normal	≥ -2 SD to ≤ +1 SD
Overweight	> +1 SD to ≤ +2 SD
Obese	> +2 SD

<sup>1</sup>WHO Growth Reference (2007)

deviation for continuous data for the descriptive statistics of variables. An independent t-test was conducted to assess the score differences in the maternal feeding subscales between normal and overweight and obese children. Chi-square test was used to test the association between socio-demographic backgrounds with children's Body Mass Index-for-age (BMI-for-age) in categorical form. For continuous data, Pearson Product Moment Correlation (PPCM) was used to determine the association for child feeding practices and children's BMI-for-age and the level of significance was set at  $p < 0.05$ . Multiple linear regression was conducted in determining the risk factors of children's BMI-for-age based on the data on bivariate analysis. For this analysis, only variables that significantly associated with children's BMI-for-age with the significance level  $p < 0.25$  in the bivariate analysis were included. Six variables that met the criteria which are mother's employment status, child's birth weight, maternal concern on child weight, maternal perception of child weight status, food restriction and pressure to eat were included in the final model.

## RESULTS

### First phase (Screening phase)

Table II shows the distribution of socio-demographic characteristics of respondents (mother and child) in

**Table II: Socio-demographic backgrounds of the respondents (n = 209)**

Variables	n (%)	Mean ± SD
<b>Mother</b>		
Age (years)		34.44 ± 5.63
19 – 29	32 (15.3)	
30 – 39	139 (66.5)	
≥ 40	38 (18.2)	
Ethnicity		
Malay	200 (95.7)	
Indian	7 (3.3)	
Chinese	1 (0.5)	
Others (Orang Asli)	1 (0.5)	
Religion		
Islam	201 (96.2)	
Buddha	1 (0.5)	
Hindu	7 (3.3)	
Marital status		
Married	194 (92.8)	
Divorced/ Widowed	15 (7.2)	
Educational level		
School	140 (75.6)	
University	51 (24.4)	
Employment status		
Working	102 (48.8)	
Not working	107 (51.2)	
<b>Child</b>		
Age (years)		5.07 ± 0.76
4	52 (24.9)	
5	89 (42.6)	
6	68 (32.5)	
Gender		
Male	103 (49.3)	
Female	106 (50.7)	
Birth weight (kg)		2.88 ± 0.59
Low birth weight	44 (21.1)	
Normal	165 (78.9)	

the first phase of the study (n =209). In the screening phase, more than half of the mothers (66.5%) were in the age group range between 30 to 39 years old, 95.7% of mothers were Malay and 96.2% were Islam. Half of the mothers (51.2%) were housewife and 75.6% of them attended school with at least attended primary school for their educational level. The distribution of children was varied across the age group with the highest were children aged five years old (42.6%), six years old (32.1%) and four years old (24.9%) respectively. Majority of the children were female (50.7%) and have a normal birth weight (78.9%).

Table III shows the distribution of children’s BMI-for-age (z-score) based on gender. Overall, 29.2 % were classified as severe thinness or thinness, 45.9% categorized as normal and 24.9% were overweight or obese.

**Table III: BMI-for-age of children according to gender (n = 209)**

BMI-for-age (z-score)	Gender		Total n (%)
	Male	Female	
	n (%)	n (%)	
Severe thinness	12 (11.7)	6 (5.7)	18 (8.6)
Thinness	21 (20.4)	22 (20.8)	43 (20.6)
Normal	45 (43.7)	51 (48.1)	96 (45.9)
Overweight	12 (11.7)	8 (7.5)	20 (9.6)
Obese	13 (12.5)	19 (17.9)	32 (15.3)
Total	103 (49.3)	106 (50.7)	209 (100.0)

**Second Phase**

In the second phase of the study, only normal and overweight and obese children were selected. Thus, from 209 children in the first phase of the study, only 148 children that fall in the normal, overweight and obesity group were included. Based on Table IV, approximately about 45.9% of children were classified as normal and 24.9% were classified in the overweight and obesity group. It also shows the distribution of socio-demographic backgrounds of normal and overweight/obese children and their parents in the second phase of the study (n =148) and the association with children’s

**Table IV: Socio-demographic characteristics and distribution of normal and overweight/obese children and their parents (n = 148) and the association with children’s BMI-for-age**

Variables	Children’s BMI-for-age			X <sup>2</sup>	p
	Normal (n = 96)	Overweight / Obese (n = 52)	Total (n = 148)		
	n (%)	n (%)	n (%)		
Mother’s age (years)				1.124	0.570
19 – 29	12 (12.6)	6 (11.5)	18 (12.2)		
30 – 39	64 (67.4)	39 (75.0)	103 (70.1)		
≥ 40	19 (20.0)	7 (13.5)	26 (17.7)		
Ethnicity					0.059 <sup>1</sup>
Malay	95 (99.0)	48 (92.3)	143 (96.6)		
Indian	1 (1.0)	4 (7.7)	5 (3.4)		
Religion					0.059 <sup>1</sup>
Islam	95 (99.0)	48 (92.3)	143 (96.6)		
Hindu	1 (1.0)	4 (7.7)	5 (3.4)		
Marital status					0.275 <sup>1</sup>
Married	91 (95.8)	45 (90.0)	136 (93.8)		
Divorced/Widowed	4 (4.2)	5 (10.0)	9 (6.2)		
Mother’s educational level				3.300	0.069
School <sup>2</sup>	64 (66.7)	42 (80.8)	106 (71.6)		
University	32 (33.3)	10 (19.2)	42 (28.4)		
Mother’s employment status				9.135	0.003*
Working	60 (62.5)	19 (36.5)	69 (46.6)		
Not working	36 (37.5)	33 (63.5)	79 (53.4)		
Child’s age (years)				0.329	0.848
4	24 (25.3)	12 (23.1)	36 (24.5)		
5	41 (43.2)	25 (48.1)	66 (44.9)		
6	30 (31.6)	15 (28.8)	45 (30.6)		
Child’s gender				0.020	0.889
Male	45 (46.9)	25 (48.1)	70 (47.3)		
Female	51 (53.1)	27 (51.9)	78 (52.7)		
Child’s birth weight				3.302	0.069
Low birth weight	23 (24.0)	6 (11.5)	29 (19.6)		
Normal	73 (76.0)	46 (88.5)	119 (80.5)		

\*p<0.05 (Chi-square test)

<sup>1</sup>Fischer’s exact test

<sup>2</sup> Educational level for school include primary and secondary school

BMI-for-age. Based on this table, the percentage of overweight/obese children was slightly higher in non-working mothers (63.5%) compared to working mothers (36.5%) and mother’s employment status was significantly correlated with children’s BMI-for-age (X<sup>2</sup> = 9.135, p<0.05).

**Child Feeding Questionnaire (CFQ)**

Table V shows the distribution scores of the CFQ subscales of mothers with normal and overweight/obese children. There is a significant mean difference in the score of the subscale of perceived child weight status

**Table V: Score differences in maternal feeding subscales of mothers between normal weight and overweight/obese children (n = 148)**

Maternal feeding subscales	Children’s BMI-for-age			t	p
	Normal weight (n = 96) Mean ± SD	Overweight/ Obese (n = 52) Mean ± SD	Total (n = 148) Mean ± SD		
Beliefs					
Perceived responsibility	3.99 ± 0.77	3.87 ± 0.88	3.95 ± 0.81	0.913	0.363
Perceived mother’s weight	3.17 ± 0.35	3.20 ± 0.35	3.18 ± 0.35	-0.463	0.644
Perceived child weight*	2.95 ± 0.37	3.10 ± 0.37	3.00 ± 0.37	-2.379	0.019*
Attitude					
Concern about child weight	3.42 ± 0.83	3.65 ± 0.82	3.50 ± 0.83	-1.668	0.097
Practices					
Restriction on food	3.60 ± 0.64	3.41 ± 0.65	3.51 ± 0.65	1.401	0.164
Pressure to eat	3.66 ± 0.60	3.50 ± 0.60	3.60 ± 0.60	1.599	0.112
Monitoring	3.84 ± 0.85	3.65 ± 0.93	3.78 ± 0.88	1.252	0.213

\*p<0.05 (Independent t -test)

between normal weight children and overweight/obese children while no significant differences in the other subscales.

### Relationship between maternal feeding subscales with children's BMI-for-age

The relationships between the maternal feeding subscales scores and the children's BMI-for-age are shown in Table VI. Perceived child weight status ( $r = 0.267$ ,  $p < 0.05$ ) and food restriction ( $r = 0.186$ ,  $p < 0.05$ ) were positively associated with children's BMI-for-age, while pressure to eat ( $r = -0.177$ ,  $p < 0.05$ ) was negatively associated with child's BMI-for-age.

**Table VI: Correlation between CFQ subscales (parental child feeding beliefs, attitudes and practices) and children's BMI-for-age**

CFQ subscales	r	p-value
Perceived responsibility	0.022	0.795
Perceived mother's weight	-0.034	0.684
Perceived child weight	0.267	0.001*
Concern about child weight	0.075	0.367
Restriction on food	0.186	0.024*
Pressure to eat	-0.177	0.032*
Monitoring to eat	-0.123	0.137

\* $p < 0.05$

Multiple linear regression was conducted in assessing the risk factors of children's BMI-for-age. Based on Table VII, mother's employment status ( $B = 0.883$ , 95% CI: -1.466, -0.300;  $p < 0.05$ ), mother's perception on child weight status ( $B = 1.117$ , 95% CI: 0.330, 1.905;  $p < 0.05$ ) and pressure to eat ( $B = -0.591$ , 95% CI: -1.100, -0.083;  $p < 0.05$ ) were found as risk factors of children's BMI-for-age.

## DISCUSSION

The prevalence and severity of childhood obesity are steadily increasing and recognized as a global public health problem. A similar situation was also reported in the present study which the overall incidence of overweight and obese children is 24.9% and was considerably higher among children. According to the findings by the National Health and Morbidity Survey (2015), the overall prevalence of children age below 18 years old is 11.9% which the highest prevalence was noted among

children aged five to nine years old (14.8%) (2). Since this study was conducted among pre-schoolers aged four to six years old, the incidence of overweight and obese children was considered higher. This is because when compared with the study conducted among pre-schoolers in Putrajaya, the prevalence of overweight and obese children was 7.3% (20). Overweight and obesity in children are reported to significantly have an impact on the physical and psychological health of children. This is because those overweight and obese children will most likely stay obese in their adulthood and increase the probability to develop non-communicable diseases such as cardiovascular diseases and diabetes in the future (21).

In the present study, maternal employment was shown to significantly associate with children's BMI-for-age. However, the number of overweight and obese children was higher among non-working mothers compared to working mothers which contradicted with the study conducted among children from selected kindergartens in Selangor by Shuhaimi & Muniandy (2012) (22). From this study, the prevalence of obesity among employed mother's children was higher compared to unemployed mother's children although it showed a poor positive relationship. Another study also reported that maternal employment status was associated with increases in children's BMI-for-age and this particularly happening between working mothers especially mothers who work with long working hours (23). For those mothers who are working, they probably have little time in providing healthy food for their children and thus explained the possible poor eating habits among children with working mothers (24). The prevalence of overweight and obese children was higher among working mothers compared to non-working mothers. This is because working mothers usually spend more and longer time on their work and less likely to have time to prepare a healthy and balanced meal for their children (24). Therefore, it might cause mothers to choose a fast and less time spending choice which could explain the possible reason for choosing fast foods and ready-to-eat meals for their children (25). However, there is also a study reported that the association between maternal employment status and children's BMI-for-age varies within different age groups which the effect was likely seen in the older age group which could explain the

**Table VII. Associated socio-demographic background, maternal beliefs and feeding practices with children's BMI-for-age using multiple linear regression**

Variable	Unstandardized coefficients		Standardized Coefficients	95% CI		p-value
	B	Std. Error		Lower Bound	Upper Bound	
Mother's employment status	0.883	0.295	0.237	-1.466	-0.300	0.003*
Child's birth weight status	0.561	0.369	0.120	-0.169	1.290	0.131
Concern about child weight	0.298	0.183	0.132	-0.064	0.659	0.105
Perceived child weight	1.117	0.398	0.224	0.330	1.905	0.006*
Restriction on food	-0.148	0.241	-0.051	-0.625	0.329	0.540
Pressure to eat	-0.591	0.257	-0.189	-1.100	-0.083	0.023*

\* $p < 0.05$ ;  $R^2$ : 0.188; adjusted  $R^2$ : 0.154

reason of inconsistent findings (26). One study reported an association of employment status with children's BMI-for-age through socio-economic aspects in which children who grow up in low-income families are more likely to be overweight and obese compared to those living in wealthier households. When mothers work more, the household income will increase and reduce thus helps the families escaped from poverty (27). A higher household income will actually help to purchase more healthy foods and probably hire quality child care and directly helped to improved children's BMI-for-age (27).

Maternal perception on a child's weight status was positively correlated with children's BMI-for-age. In the present study, the mean score of maternal perception of child weight status was slightly higher among overweight and obese children compared to normal children which the finding of the study was consistent with previous studies (28,29). The ability of mothers in the present study to perceive their children's weight status may due to the increasing awareness of childhood obesity issues in Malaysia such as more health programs were organized focusing on children's weight status. However, a few studies also reported the opposite findings which some mothers failed to recognize their children's weight status that leads to either underestimate or overestimate their children's current weight status (30). Maternal misperception was probably happening due to the lack of understanding of overweight and obesity problems, a reluctance to admit the facts of their children are overweight or obese or mothers probably think obesity is not a health issue (12). A study conducted among Turkish mothers also reported that mothers with overweight children usually misclassified their children because they are unaware with the fact of their children might suffer from childhood obesity which mothers usually find overweight in children is a signal that the children are growing healthily (31).

The present study reported that restriction of food was not statistically significant with children's BMI-for-age and this is similar to the study conducted among children in developing countries (28). However, the evidence of the literature on the association of restriction of food with children's BMI-for-age is mixed which some study reported the contradicted results (32). The lack of consistent results may due to the different definition of the restriction of food's level by each mother. Some mothers might explain as too much as some might consider as an acceptable level which the detailed explanation was unreported in the published literature (33). Mothers who expressed concern on their children's weight were most likely using restrictive feeding practices, however, this occurs more among girls compared to boys. Mothers usually more concerned about their daughter's weight status compared to boys (14). Mothers with obese children tend to use restrictive feeding more often as they might be a concern to improve

their children's weight status. Restriction of food can be a protective factor against childhood obesity however, using this kind of feeding practices excessively may lead to the development of negative eating behaviours such as overeating that can cause excessive weight gain in children (34). Excessively in food restriction method may cause the children to become more eager to eat the restricted foods such as snacks, sweets and high-fat foods by the mothers which if they come across with those foods, they tend to overeat the restricted foods (35).

For pressure to eat, the present study reported consistent results with other studies which most of the literature reported that pressure to eat was negatively associated with children's BMI-for-age (33,36). Mothers with overweight and obese children were less likely pressuring their children to eat probably due to being aware of their children's body weight status (33). In most overweight and obese children, mothers were less probably using pressure to eat methods in encouraging their children to eat as pressure to eat often occurs in underweight and normal children or usually happened when mothers perceived their children were under-eating (37). This probably happened when they think their children were not eating a sufficient amount of food or being a picky eater.

Food restriction, pressure to eat and food monitoring can be classified as an authoritarian feeding style, in which this type of feeding style was usually being associated with unhealthy feeding practices as mothers might use rewards or punishment to make sure their children are eating (34). Excessively controlling what their children eat or pressuring their children to eat can distract the ability of the children to develop their self-regulation as they eat based on their mother's preferences rather than their own choices. Pressuring the children to keep on eating, although they were not hungry can cause the children to lose their signals of either being hungry or full (35). This contributed to the development of negative eating behaviours such as picky eaters, develop eating disorder problems such as bulimia nervosa and increase the risk of childhood obesity (39). Maternal misperception on children's weight status and excessive control, pressure and restrictive feeding practices without proper guidelines will cause a delay in seeking treatment of childhood obesity (18).

## CONCLUSION

The findings of this study have provided knowledge on maternal beliefs, attitudes and feeding practices in relation to the child's weight status. From the present study, mothers of overweight and obese children were most likely to control their children's food intake through restrictive feeding practices while pressure to eat was less likely being practised among mothers with overweight and obese children. Maternal misperception

also commonly happened among overweight and obese children since mothers were less likely unaware of their children's weight status. Thus, it is important for mothers to learn and understand the correct eating practices and to create awareness among mothers regarding the negative impacts of unhealthy feeding practices on their children's weight status. Health care professionals should help mothers in understanding these issues and correct any inappropriate child feeding practices and eventually promote the development of normal eating behaviour among children. This would help to reduce the prevalence of childhood obesity and practising healthy eating behaviours, especially among younger children.

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