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Parental Concerns and Control in Feeding of 9 to 12-Year-Old Children in a Primary School in Kuala Lumpur, Malaysia

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ABSTRACT

Introduction: Body weight of children is affected by many factors including food habits which are influenced by their parents. Studies in the West have shown that parents tend to control child feeding in response to their child's weight status. The aim of this study was to assess Malaysian parental concerns about child weight and the control they exert on child feeding. **Methods:** This cross-sectional study was conducted on parents and their children aged 9 to 12 years from a primary school in Kuala Lumpur. The weight status of the children was classified according to the body mass index-for-age growth chart. Parental concerns about child weight and control in child feeding was assessed using the adapted Malay version of Child Feeding Questionnaire. **Results:** A total of 204 parents participated in this study. The study found that being a female served as a protective factor against becoming overweight (OR:0.28, CI:0.13-0.62). Parents with overweight children were significantly older (OR:1.08, CI:1.01-1.15), concerned about their child's weight (OR:2.77, CI:1.49-5.12) and controlled their child's feeding by restricting food intake(OR:2.70, CI:1.30-5.60). They were less likely to pressure their children to eat (OR:0.32, CI:0.19-0.56). Parents from the low income group were more likely to have underweight children (OR: 4.15, CI:1.28-13.47). **Conclusion:** There was significant difference in level of parental concern across differing child weight status. Parents with overweight children were likely to be more concerned about their child's weight, tending to control their feeding. In contrast, parents with underweight children did not exert control on their feeding.

Keywords: Body weight, child, food habit, nutrition, parents

INTRODUCTION

Malaysia continues to face a double burden of weight problems among children: there is an increasing trend in the prevalence of overweight children and a non-resolving problem of underweight children. Data from the Third National Health Morbidity Survey showed the overall prevalence of overweight children to be 5.4% and underweight to be 13.2% (Institute of Public Health, 2006). This is often the result of unhealthy eating practices among children which frequently starts from home. Parents are responsible for

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creating an eating environment for their children through food provision, role modelling of their own eating attitude and style as well as exertion of feeding control (Scaglioni, Salvioni & Galimberti, 2008). Parental feeding practices can be affected by their own understanding of weight and eating related issues, observed child weight status, perceived child weight status and concerns of their children developing a weight problem in the future (Francis, Hofer & Birch, 2001).

There is a linear relationship between parental concern about child weight with parental control in child feeding. Control over child eating behaviour is the expected reaction of concerned parents. These parents frequently believe that their children need their assistance to determine what, when and how much to eat (Brown & Ogden, 2004; Rhee *et al*., 2009). Parental control over child feeding is through monitoring the child's food intake, restricting the amount and type of food or pressuring their child to eat certain amounts and types of food (Birch *et al*., 2001).

A recent study on 183 Australian mothers was also able to demonstrate the positive relationship between parental concerns about the child's weight with their practice in either restricting food intake or pressuring the child to eat. Parents, who are concerned about their child being overweight, will tend to restrict food or drink intake. In contrast, parents with underweight children tend to pressure their child to eat. However, in that study, parental monitoring was not directly related to parental concern about their child 's weight status (Gregory, Paxton & Brozovic, 2010).

Control of child-feeding practices is associated with negative impacts on child eating behaviour such as poor eating regulation, increased food intake, reduced preference for healthy food, reduced acceptance of a variety of food, and enhanced preference for junk food (Fisher & Birch, 2002; Scaglioni *et al.*, 2008). Parental restriction is associated with increased eating and weight gain in the children (Faith *et al*., 2004; Campbell *et al*., 2010).

To date, there is no documented evidence on Malaysian parent's child feeding practices. The present study aims to determine the association between child weight status and parental concerns about child weight and parental control in child feeding. It is hoped this study will provide new knowledge in terms of Malaysian child feeding practices, provide suggestions for modification of any inappropriateness in practices and ultimately help control the weight status problem in children.

METHODS

This study was conducted in a conveniently selected national primary school in Kuala Lumpur, located 1.5km from the researchers' institution. It involved parents of children aged 9 to 12 years studying in the school. This age group was chosen as earlier studies have shown that overweight children are more prevalent in this age range (Kasmini *et al*., 1997; Moy, Gan & Mohd-Kassim, 2004). Parents of children with special needs (e.g., Down syndrome or mentally retarded) or with medical problems or on medication (e.g., steroids) which may affect the weight status were excluded. Children who were absent during the data collection period were also excluded from the study.

In total there were 612 students from years 4, 5 and 6 during the data collection period. The minimum required sample size for this study was 195 students with an estimated 15% prevalence of overweight children (Tee *et al*., 2002), absolute precision of 5% and a confidence level of 95%. The vice principal of the school acted as the coordinator of this project and helped to randomly select 270 students from the school registration list. The information sheet, consent form and questionnaires were distributed by the respective class teachers to parents of the selected students and collected a week later.

Questionnaire

The most commonly used assessment tool to measure child's feeding practice is the child feeding questionnaire (CFQ). It assesses child feeding in aspects related to parents' beliefs, attitudes, and practices, focusing on childhood obesity. In total there are 31 questions in CFQ with seven domains which fall into two main categories. The first category measures risk factors for development of childhood obesity and parental concerns of their child weight status. This category consists of four domains which include parental perception of feeding responsibility, parental perception of own overweight, parental perception of their child's overweight and concern about child weight. The second category measures parental control in child feeding practices. This category consists of three domains which are parental monitoring of child eating habit, parental restriction of food intake and parental pressure to eat. The CFQ was validated on parents in Pennsylvania and Colorado with the internal consistencies for all seven domains being above 0.70 (Birch *et al.*, 2001)

In order to match the objective of this study, that is, parental concern and control in child feeding and its association with child weight status, only four domains from the CFQ (parental concern, monitoring, restriction and pressure to eat) were used for this study. The remaining three domains were excluded as the domains measure the risk factors for developing overweight children and were beyond the aim of this study.

There were 18 questions from CFQ used in this study. Parental concern about child weight measures their concern with regard to quantity of food intake, maintenance of a desirable weight and prevention of overweight in their children using three questions. Parental control in child feeding practice was measured using eight questions on food restriction, four questions on pressure to eat, and three questions on monitoring. Parental restriction measures the extent of parental attempts to restrict access to food, including the type and amount of food. Parental pressure to eat domain measures parents' attempts to increase their children's food intake by increasing the portion and calories. Parental monitoring measures parents' attempt to keep track of their children's intake of high calorie food. Parents graded their response using a 5-point Likert scale from 1 (never) to 5 (always). A higher mean score in each domain indicates higher levels of parental concern and control in child feeding (restriction, pressure to eat and monitoring) respectively.

This questionnaire was adapted with permission from the original authors. The selected domains of the CFQ were subjected to a forward and backward translation process by four independent qualified linguistic professionals. In addition the questions were reviewed by an expert nutritionist for content validity. Minor modifications were made in the list of food items. For example, sweet food such as candy, ice cream cake, pies, pastries were replaced with sweets, soft drinks and doughnut. Snack food such doritos and cheese puffs were replaced with crackers and curry puffs. The Malay version was then pre-tested on 21 parents in the local community for comprehension and reliability testing. The internal reliability of all domains was 0.73.

Anthropometric measurements

Children whose parents consented and completed the questionnaire were then measured for height and weight by a single researcher during the following week, using a calibrated Seca-weighing machine with attached height. The weight was measured to the nearest 0.1kg with the respondent wearing light clothing without shoes and the height was measured to the nearest

0.1cm. The body mass index in kg / m2 was calculated using the standard formula and plotted on the Centres for Disease Control-United States BMI (CDC-US BMI) growth chart. This chart was chosen as it is recommended for use by the local clinical practice guideline on management of obesity (Ministry of Health & Academy of Medicine, 2004).Values less than the 5th percentile were classified as underweight; values between 5th to 85th percentile were considered as normal weight; and values above the 85th percentile were considered as overweight.

Statistical analysis

Data was entered and analysed using the SPSS version 16.0. The parents and children's socio-demographic profiles are described using frequencies. Independent sample *t*-test was used to elicit any difference in parental concern and control in child feeding. Multinomial regression analysis was used to elicit the relationship between child weight status with parental concern and control in child feeding. The dependent variable was children's weight status of either overweight or underweight with normal weight set as the reference point. The independent variables were parental socio-demographic profiles (age; gender: female as the reference; level of education: secondary as the reference; and family income: low income group as the reference); children's socio-demographic profiles (age and gender: female as the reference); parental concern and control (restriction, pressure to eat and monitoring) in child feeding. The level of significance for all analyses was set at a *p*-value of less than 0.05.

This study was approved by the Ethical Committee of Universiti Kebangsaan Malaysia and the researchers obtained permission from the Education Department of Federal Territory and the school principal. All the parents and children included in this study had given their consent prior to data collection.

RESULTS

From the 270 parents recruited, a total of 219 parents consented and returned the questionnaires. There were 51 non respondents who either refused to participate or failed to return the questionnaire to the researcher or children being absent during anthropometric measurements. Another 15 respondents were dropped due to incomplete responses mainly in the parental concern and control of child feeding questions. Thus finally, only 204 complete responses were available for the final analysis.

The mean age of parents was 42.9 ± 5.9 years. Most (64.7%, n=132) of the respondents were mothers, belonging to the Malay ethnic group (97.0%, n=198) and had secondary level of education (79.4%, n=162). More than half of the parents (56.4%, n=115) belonged to the low income group earning less than RM1500 per month based on the classification by Malaysian Economic Planning Unit (2001). The mean age of the children was 10.8± 0.9 years with more than half being females (54.9%, n=112). Most of them (57.8%, n=118) belonged to the category of normal weight followed by overweight (27.5%, n=56) and underweight (14.7%, n=30). (Table 1). There was no difference in the level of parental concern about child weight and control in child feeding between mothers and fathers (Table 2).

Based on the multinomial logistic regression analysis, parents of the low income group were more likely to have underweight children (OR:4.15, CI:1.38-13.47). Girls were less likely to be overweight (OR:0.28, CI: 0.13-0.62). An increase in parental age (OR:1.08, CI:1.01-1.15), higher parental concern about child weight (OR:2.77, CI:1.49-5.12) and higher parental restriction on food intake (OR:2.70, CI:1.30-5.60) increased the odds of having overweight children. Higher parental pressure to eat (OR:0.32, CI: 0.19-0.56)

Table 1. Socio-demographic characteristics of parents and children

Variables	*Percentage (n)*
Gender	
Mother	64.7 (132)
Father	35.3 (72)
Ethnicity	
Malay	97.0 (198)
Indian	1.5 (3)
Chinese	0.0 (0)
Others	1.5 (3)
Family income (monthly)	
RM<1500	56.4 (115)
RM1500-3500	32.3 (66)
RM>3500	11.3 (23)
Level of education	
Primary	8.8 (18)
Secondary	79.4 (162)
Tertiary	11.8 (24)
Gender of children	
Female	54.9 (112)
Male	45.1 (92)
Children's weight status	
Underweight	14.7 (30)
Normal	57.8 (118)
Overweight	17.4 (56)

Table 2. Association between parental gender with their concern and control in child feeding

	Mothers(n=131)	*Fathers(n=73)*	*F*	*p-value*
	Mean score±SD	*Mean score±SD*		
Parental concern	3.98±0.93	4.02±0.76	2.36	0.76
Parental control				
Restriction	3.56±0.61	3.58±0.61	0.01	0.80
Pressure	3.70±0.83	3.54±0.81	<0.01	0.18
Control	3.49±0.99	3.42±0.86	1.27	0.64

decreased the odds of having overweight child (Table 3).

DISCUSSION

Overall, the majority of the parents who participated in this study were mothers, belonging to the Malay ethnic group and came from the low income group. There was no difference in parental gender in relation to their responses on parental concern about child weight and control in child feeding. This finding is in contrast to traditional Malaysian mothers who play an important role in child feeding. In addition, a study on parents in Iowa also showed that there is a gender bias in child feeding. Although mothers are more concerned about child

Table 3. Multinomial logistic regression analysis showing individual parameter estimates

	B	*95% Confidence Interval*			
		Standard error	*Odds ratio*	*Lower bound*	*Upper bound*
Underweight vs Normal weight					
Intercept	-5.67	3.38	0.93	0.56	1.54
Concern	0.17	0.26	1.18	0.71	1.98
Restriction	-0.34	0.41	0.71	0.32	1.60
Pressure	0.64	0.33	1.90	0.98	3.66
Monitoring	0.20	0.28	1.22	0.71	2.10
Age (children)	-0.76	0.26	0.93	0.56	1.54
Age (parents)	0.04	0.04	1.04	0.96	1.13
Gender (children)	-0.39	0.46	0.68	0.27	1.67
Gender (parents)	0.46	0.51	1.58	0.58	4.29
Parents LOE	-0.41	0.96	0.67	0.10	4.33
Parents income	1.42	0.60*	4.15	1.28	13.47
Overweight vs normal weight					
Intercept	-0.64	2.97*			
Concern	1.02	0.31**	2.77	1.49	5.12
Restriction	0.99	0.37*	2.70	1.30	5.60
Pressure	-1.13	0.28***	0.32	0.19	0.56
Monitoring	-0.23	0.23	0.80	0.50	1.25
Age (children)	-0.02	0.22	0.98	0.64	1.50
Age (parents)	0.07	0.03*	1.08	1.01	1.15
Gender (children)	-1.28	0.41**	0.28	0.13	0.62
Gender (parents)	0.05	0.40	1.05	0.48	2.33
Parents LOE	0.38	0.65	1.46	0.41	5.23
Parents Income	0.04	0.43	1.04	0.45	2.41

Cox & Snell R^2=0.33, Negelkerke R^2 0.38
Model $\chi^2(22)=80.36, p<0.001$,*p<0.05,**$p<0.01$***$p<0.001$
LOE- Level of Education

weight status, fathers play a greater role in child feeding practice (Johanssen, Johanssen & Specker, 2006). It is likely that nowadays, both Malaysian mothers and fathers carry equal responsibilities in feeding and caring for their children.

Parental feeding beliefs, attitude and practices have been shown to influence eating behaviour and weight status of their children (Faith *et al*., 2004; Scaglioni *et al*, 2008). Based on this study, complex interactions were found between parental age, child's gender and level of parental concern about child weight and control in feeding of overweight children. An increase in parental age increases the likelihood of having an overweight child. Being a girl is a protective factor of becoming overweight and this is supported by our local data and a recent study which documented that there is a higher prevalence of overweight in boys compared to girls (Institute of Public Health, 2006; Khor *et al*., 2011).

In the present study, parents of overweight children were more concerned about their child's weight status compared to the normal children. This implies that Malaysian parents are aware of the overweight problem in their children. This is similar to the results found in a South American study (Mulder *et al.*, 2009). As parents play a major role in child feeding, it

is pertinent for them to have a certain level of concern about their child's weight. Parent's concern over their child's weight also indicates their readiness to make changes in their child's eating habits (Francis, Hofer & Birch, 2001; Rhee *et al.*, 2005). However, the level of concern should ideally be in moderation to be able to motivate behavioural change. Overly concerned parents may pose direct or indirect criticism of their children which may lead to low self-esteem, continuation of a sedentary lifestyle, hence leading to an increase in weight. In contrast, low parental concern leads to neglect in child feeding and promotes weight gain instead (Agras *et al.*, 2004).

Parents of overweight children in this study also tend to be more controlling through the restriction domain, nearly three times as those of normal children. This is in support of earlier studies where parents of overweight children showed a high level of control particularly by restricting their child's access to foods, including the types and amounts of food with the hope of changing their child's eating habits (Faith *et al*., 2004; Scaglioni *et al*., 2008). It is very important to highlight to these parents that excessive control in child feeding may not predict changes in child eating behaviour (Gregory *et al.*, 2010; Rhee *et al*., 2005). Restrictions on the child may also lead to negative eating behaviour as the child may begin eating in the absence of hunger and this may lead to weight gain and further worsen the overweight problem (Francis & Birch, 2005; Faith *et al*., 2004). Instead of controlling child feeding, parents should focus more on role modelling healthy eating behaviour.

As expected, parents of overweight children in this study were less likely to exert pressure to eat in their children, a similar finding found in a study conducted by May *et al*. (2007). Less pressure is imposed on their children to eat if their parents are concerned about their child becoming overweight (May *et al.*, 2007). Pressure to eat is more likely by parents when their children are thin and underweight (Davison & Birch, 2001). It is a natural response in the parents to pressure their child to eat in order to ensure that their children are eating enough (Robinson *et al*., 2001; Gregory *et al*., 2010). On the contrary, parents of underweight children in this study did not significantly control and pressure their children to eat. This is indeed a desirable relationship as studies have shown that excessive pressure to eat may disrupt children's responsiveness to internal cues of satiety and hunger, leading to an inability to regulate their energy intake (Fisher & Birch, 2002; Robinson *et al*., 2001). This feeding practice may become a habit as the children grow and may lead to overeating and weight gain (Brann & Skinner, 2005; Robinson *et al*., 2001). The pressure to eat certain foods, for example, fruit and vegetables could also make their children become picky eaters (Birch & Fisher, 1998; Gregory *et al*., 2010). The non-pressure to eat practised by parents of underweight children in this study could also be explained by their limited choice and food availability, a result of their low income status. Parents from this group were four times more likely to have underweight children.

This study poses several limitations which includes socially accepted bias as the questionnaires were self-administered. In addition, being a cross-sectional study, the causal relationship between parental concern about child weight and control in child feeding with child weight status could not be firmly determined although the use of logistic regression analysis may be able to further strengthen the association. As we relied highly on the school authority for the students' selection, this may have led to selection bias and may not represent the true study population. Nevertheless the results of this study are not to be treated lightly, as inadequacies in child feeding practices persist in our population and need to be improved upon.

CONCLUSION AND RECOMMENDATIONS

The findings of this study have provided knowledge on Malaysian child feeding practices in relation to their child weight status. Favourably, parents of underweight children were found not to exert control in child feeding. On the contrary, parents of overweight children were concerned with their child's weight status and more likely to control their feeding by restricting their food intake. However, it is vital to create awareness among parents of the negative impacts of excessive concern and control in child feeding on the child's weight status. Instead, it should be adequate to promote a healthy environment which will allow children to self-regulate their eating habits. Health care professionals need to be vigilant and correct any inappropriate child feeding practices especially among overweight children and promote the development of normal child eating behaviour. This would help solve weight-related problems among children and help build a healthy nation.

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