Relationships of Kindergarten Children's BMI amongst Parental Body Dissatisfaction and Dietary Restraint: A Case Study in Hong Kong

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Abstract

Objective: In this study, the aim was to explore the relationships of kindergarten children's BMI amongst parental factors such as parental BMI, body dissatisfaction, parental dietary restraint, child weight concern and child weight-focused restrictive feeding.

Method: 466 kindergarten students' parents were participated in this study. A self-administrated questionnaire was distributed to parents. Independent t-test, one way ANOVA and Pearson's correlation were performed to analyze the relationships amongst different factors contributing to children's BMI.

Results: 30% parents and 37% children were found either overweight or obese. The six pathways in the proposed model were all significantly correlated. It was found that parental BMI significantly correlated with body dissatisfaction [r (466)=0.282, p<0.001], which was then associated strongly with parental dietary restraint [r (466)=0.715, p<0.001] and weakly with child weight concern [r (466)=0.146, p=0.002]. The child weight-focused restrictive feeding practice was moderately correlated with both parental dietary restraint [r (466)=0.360, p<0.001] and child weight concern [r (466)=0.320, p<0.001], and then significantly correlated with child BMI [r (466)=0.121, p=0.009].

Conclusion: The results of this study confirmed the presence of upward trend of childhood obesity in Hong Kong. In addition, parental body dissatisfaction was found to be a significant factor to determine parental dietary restraint, which was associated with child weight-focused restrictive feeding and finally affected child BMI.

In contrast to the above hypothesis, there were studies indicating that child weight focused restrictive feeding practice not only failed to control child weight, but also associated with the increase in their BMI [28,34]. Consistent studies were found that the restriction would in turn increase the child's prevalence and consumption of restricted food [28,35]. It was also proposed that the higher the level of restrictive feeding, the higher is the tendency of overeating by child [36]. It was found that restrictive feeding practice would promote the child's habit of eating due to desire, but not hunger.

The aim of this study was to explore the factors affecting kindergarten child's BMI in Hong Kong by application of the model proposed by Rodgers et al. [7], such as the influence of parents own body image perception, eating behavior on children weight concern and type of feeding practice. In this study, the model [7] was slightly modified by replacing the maternal BMI and maternal dietary restraint by parental BMI and parental dietary restraint respectively as shown in Figure 2. The major difference was that the target group shifted from mothers to parents of child.

Figure 2: Modified model based on the study of Rodgers et al. [7].

The current research was carried out during the 2013-2014 academic year. 11 kindergartens in Hong Kong were accepted our invitation to participate in this study. 1860 questionnaires were distributed with 609 questionnaires returned. The response rate was around 33%. Finally, there were 466 questionnaires valid in total.

All subjects participated voluntarily. Approval to conduct this study was obtained from Hong Kong Council of Early Childhood Education & Services. Ethical requirements for the collection of personal data of the Institute of Vocational Education were strictly followed. Questionnaires were distributed to parents of kindergarten students in self-administered format through class teachers in February 2014.

Questionnaire, consisting of 2 parts, was employed as a mean to measure the behaviors of parents and students. The basic demographic information of parents and child, like gender, age, height, weight, educational level were asked in the first part; and the parental behavior information was questioned in the second part. A pilot test was conducted before the beginning of survey in Feb 2014 to ensure the reliability and accuracy of questionnaire. The pilot test results were fine and acceptable.

There were mainly 6 components in the model, consisting parental BMI, body dissatisfaction, parental dietary restraint (PDR), child weight concern (CWC), child weight focused–restrictive feeding (CWFRF) and child BMI.

Parental BMI was calculated with the self-reported height and weight.

$$\text{BMI} = \frac{Weight\,(kg)}{Height\,(m)^2}$$

The five-item Weight Concern subscale of the Eating Disorders Examination Questionnaire [37] had been found valid for assessing body dissatisfaction [7]. Five items including importance of weight, reaction to prescribed weighing, preoccupation with shape or weight, dissatisfaction with weight and desire to lose weight were used to assess the frequency of participants experiencing weight concern in the past 28 days. An example item is "How dissatisfied have you been with your weight?" All the items were answered in frequency scale from +1 (Never) to +7 (Always). The mean of body dissatisfaction was taken for further analysis. In this part, the Cronbach's α was 0.878.

The frequency of parents engaging dietary restraint in the past 28 days was assessed with the five-item Restraint subscale of the Eating Disorders Examination Questionnaire [37]. Five items including restraint over eating, avoidance of eating, food avoidance, dietary rules and empty stomach were assessed in the frequency scale from +1 (Never) to +7 (Always). An example item is "Have you had a definite desire to have an empty stomach with the aim of influencing your shape or weight?" The mean of dietary restraint was taken for further analysis. The Cronbach's α was 0.837 for this part.

Underweight

The mean score of component CWC was found to be significantly difference due to the parents' education level. According to Table 7, parents either educated to Form 3 or less (M=4.829, SD=1.33); p=0.002, 95% CI [4.01, 2.59], high school level (Form 4 to 7) (M=4.619, SD=1.30); p=0.010, 95% CI [0.21, 2.37], or undergraduate degree (M=4.539, SD=1.25); p=0.023, 95% CI [0.11,2.30] were significantly more concerned about child weight when compared to those postgraduate parents (M=5.333, SD=1.37).

Child Weight Concern	**Form 3 or under**	**Postgraduate**
4.829 (±1.33)	3.33 (±1.91)	0.002
Form 4 - 7	Postgraduate	0.010
4.619 (±1.30)	3.33 (±1.91)	
Undergraduate	Postgraduate	0.023
4.539 (±1.25)	3.33 (±1.91)	

	Normal weight	Obese	0.014
	2.055 (±0.95)	2.570 (±1.18)	

Table 8: One way ANOVA test of BD, PDR in parental weight status.

Descriptive statistics and bivariate correlations for the variables of interest are shown in Table 9.

	CBMI	**PBMI**	**BD**	**PDR**	**CWC**	**CWFRF**
CBMI	1.00	-.002	.054	.100*	.085	.121**
PBMI		1.00	.282***	.304***	-.096*	.152**
BD			1.00	.715***	.146**	263***
PDR				1.00	.152**	.360***
CWC					1.00	.320***
CWFRF						1.00

Note. N=466

*p<0.05, **p<0.01, ***p<0.001

CBMI: Child BMI, PBMI: Parental BMI, BD: Body Dissatisfaction, PDR: Parental Dietary Restraint, CWC: Child Weight Concern, CWFRF: Child Weight-focused restrictive feeding.

(parents) were studied in total with 18.9% male and 81.1% female, in which 54.7% was found with normal weight, while 16.1% and 14% were found to be overweight and obese. The rates of male being overweight and obesity were found 2 and 4 times more than female respectively. The result obtained was found similar to the prevalence stated in the Health Facts of Hong Kong 2013, in which the percentage of overweight and obesity of persons aged between 18 and 64 was 36.6% in total [41].

5. DeOnis M, Blossner M, Borghi E (2010) Global Prevalence and Trends of