

RURAL PRIMARY SCHOOL CHILDREN BODY FAT AND THEIR PARENTS' PHYSICAL IMAGE PERCEPTIONS

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ABSTRACT

Parent's perception of their children's physical images such as body shape or type, weight and eating habit plays an important role in determine their attitude toward their children's development. This study was conducted to determine perceptions of rural schools' parents or guardians regarding their children's body shape, weight and eating habit and to investigate whether there was a correlation with the children's body fat mass measured with bio impedance analyzer. This descriptive study was conducted in selected rural areas located in the East of Peninsular Malaysia. A total number of 145 year one school children and their parents or guardians (total 145) participated in this study. A questionnaire was developed to measure the parents' or guardians' perceptions, while the children's actual body fat mass was measured separately using Tanita body composition analyzer. Body fat mass results showed that majority of the rural primary school children had less body fat mass for both gender. Correlation analysis using Chi-square indicated that there were significant association presences between the body fat mass with body shape, body weight and eating habit. The reported Chi-square values were $\chi^2(3)=27.15$, $p<.01$ for body shape, $\chi^2(3)=22.68$, $p<.01$ for body weight and $\chi^2(3)=19.67$, $p<.01$ for eating habit, respectively. In conclusion, early awareness pertaining their children's physical images changes will contribute to a more successful prevention and treatment of obesity among children, and this will have an impact in term of reducing the adult incidences of cardiovascular diseases in the near future.

Key words: Perception, body weight, fat percentage, eating habit, rural school

INTRODUCTION

Prevalence of overweight and obesity among Malaysian showed an increasing trend since the past decades. Overweight and obese adults Malaysian were reported to be representing almost 60% from the total adult populations (Ministry of Health, 2017; Stephanie, 2016). Obesity was label as a serious disease facing by all Malaysian since 2016 when this country was rank as the fattest population in South East Asian (CNN, 2015; Mustafa, 2016; New Straits Times, 2016). The high prevalence of obesity is not only increasing among adults in Malaysia but also in children. Normally, overweight and obese children tend to become obese when they grow older (McLean, Wake, & McCallum, 2007). Overweight and obesity in childhood can lead to diabetes mellitus and cardiovascular diseases at the younger age, and were exposed to these diseases two fold higher as compared with normal weight children (Serdula et al., 1993; Srinivasan, Bao, Wattigney, & Berenson, 1996; Yeste & Carrascosa, 2011). In addition, the total cholesterol among these overweight school children were also reported to be 2.4 times higher as compared to the normal children (Freedman, Mei, Srinivasan, Berenson, & Dietz,

2007). Hence, the ability of the parents or guardian to perceive their child physical image correctly is very crucial, this skill can be beneficial screening tool for them to detect overweight child at the early stage, and it was reported that detecting overweight by itself could identify up to 50% of a child who had two or more risk factors (Freedman et al., 2007). Furthermore, overweight was found to be closely associated with various risk factors even among young children (Berenson, Srinivasan, Wattigney, & Harsha, 1993; Daniels, Morrison, Sprecher, Houry, & Kimball, 1999; Freedman et al., 2007). Past study revealed that many parents' misconception about the children body weight (Rietmeijer-Mentink, Paulis, Middelkoop, Bindels, & Wouden, 2013), which could lead to failure to detect the problem in the earlier phase. Studies have found that parents' ability to control the overweight problem among their children are depending on their knowledge, attitude and perception on overweight and obesity (Garrett-Wright, 2011; Towns & D'Auria, 2009). However, the ability to estimate their children's physical images among these parents or guardians who lives in the rural areas in Malaysia was still unclear. Normally, parents or guardians in the rural areas in Malaysia

possess different background in term of their education, income and their family size. As the result, the way they perceived their child's physical image might be different as compared to other parents who live in the urban area. Information on body fat mass among rural primary school and how their parents or guardians perceived the physical image will be beneficial for them to evaluate their perception ability. Hence, providing parents or guardians with the right skills to perceive their child physical image correctly will contribute to successful prevention and treatment of obesity in early childhood, and in the long run, this could also help to reduce the adult incidence of cardiovascular disease (Dinsa, Goryakin, Fumagalli, & Suhrcke, 2012; Freedman et al., 2007). Childhood obesity should not be taken lightly and only label as cosmetic problem with minor clinical effect. Physical image such as shape, weight and nutritious status in childhood are good predictors of wellbeing (Dinsa et al., 2012), and can be a good indicator to predict their children health, lifestyle and eating habit in the future (Davison & Birch, 2001; Doolen, Alpert, & Miller, 2009). Parents play very important role in maintaining their children in normal weight and they are able to control some of the factors by encouraging good behaviours and positive physical image (Golan & Weizman, 2001). In contrast, discouragement by parents or guardians pertaining negative behaviour and physical image among their child can postpone the child's prosperity with respect to weight reduction (Golan, 2006; Spear et al., 2007). Hence, this study was conducted to determine perceptions of rural school parents or guardians regarding their children's body shape, weight and eating habit and to investigate whether there was a correlation with the children's real body fat measured with bio impedance analyzer. This study will provide better insights on how rural primary school parents or guardians view their children's physical appearance, and help them to be more aware about their children's body shape, body weight and eating habit in the future, and in addition detecting changes in their children's physical image or appearance faster.

Material and methods

Research Design

This is a descriptive study that uses a self-administered questionnaire to measure the parents' perceptions regarding their child's body shape or type, weight, and eating habit. In addition, child's body fat mass was measure using Tanita TBF-410GS Body Composition Analyser. The Study was approved by Universiti Putra Malaysia ethic and written consent was also given by the Malaysian Ministry of Education and the Terengganu State Education Department. Hulu Terengganu district that consisted of 25 national primary schools were selected as the location for the study. However, only

three schools were selected randomly and all the primary one students were invited to participate in this study. The schools were Sekolah Kebangsaan Kuala Berang, Sekolah Kebangsaan Seri Berang and Sekolah Kebangsaan Telaga.

Subject

A total number of 145 year one primary school students who obtain written consent form their parents or guardians were involved in this study. The similar number of parents or guardians (n=145) were also involved in prescribing their child's body shape or type, weight, eating habit in this study. There were representation of 74 mothers, 65 fathers and 6 guardians. Descriptive information pertaining their background such as education levels, total income, and the number or children they have were obtained through the given questionnaire.

Instruments Used

The students' body fat mass was measured using Tanita TBF-410GS body composition analyzer. This instrument were reported to be very reliable in measuring body fat ($r = .80$) and have been widely using in by researcher in their study such as Shaikh, Crabtree, Shaw, and Kirk (2007) and Jebb, Cole, Doman, Murgatroyd, and Prentice (2000). The questionnaire for parent used in this study was adapted from a study by Hirschler *et al.* (2006) which was conducted among Argentinean preschool children. This questionnaire contains two major parts. The first part required the parents or guardians to fill in their personal and demographic information such as their education levels, income, and number of children in their family. Meanwhile, the second part required the parents' to answer questions regarding their perception on their child physical image. The parents or guardians were requested to select the best choice reflecting their child body shape or type (1. skinny, 2. normal, 3. fat, and 4. very fat), body weight (1. less body weight, 2. normal, 3. heavy, and 4. very heavy) and eating habit (1. very less, 2. less, 3. a lot, and 4. excessive eating).

Procedure and Analysis

Data collection procedure was divided into two phases. The first phase involved gathering anthropometric data from the students such as weight, height, body mass index (BMI), and body fat. Stations were set up at the school hall to measure the anthropometric data during their schooling day. The students were led by the researchers to complete the entire test at the stations. The second phase was a survey for the parents. Each child will bring back the questionnaires to be answer by the parents or guardians. The completed questionnaires were collected the next day, if the child forgotten to bring the questionnaires, they were reminded again and their form teachers were responsible to call and reminding the parents or guardians. Data was analyse and reported using frequencies and percentages. Kruskal Wallis correlation test was

used to measure the relationship between the student's body fat with their parent's physical image perceptions and the P values less than .05 was considered statistically significant.

Results

Descriptive Results

The collected data was first to determine whether they were equally distributed. Result showed that the kurtosis value was more than 4 to -4 and this indicated that the data was not equally distributed. As the results, Kruskal Wallis analysis was applied. Prior to data analysis, the parents or guardians' personal background was investigated (Table 1). Results showed that 25.5% of the parents or guardians hold a bachelor degree and above and majority were (56.6%) only have their highest education until "O" level equivalent or below. In term of income levels, majority of the parents or guardian (84.1%) earning below Ringgit Malaysia five thousands with big portion (51.0%) contributed by parents or guardian earning less than Ringgit Malaysia two thousands. Meanwhile, in term of number of children, majority of them (80.0%) have at least two to five children with three children reported to be highest contributor (26.9%).

Child Body Fat Measured by Tanita Weighing Machine

A total number of 145 guardians' had given their consent to be involved in this study, and their children had been automatically included in this study. The guardians' were consisted of 74 mothers (51.0%), 65 fathers (44.8%), and 6 care taker (4.1%). The body fat mass of the children measure by the Tanita machine was showed in Table 2. Overall, the boys were reported to have less body fat as (mean 9.56%) compared to the girls (mean 12.04%). However both were found to be in the similar category which were under fat body fat mass, which were less than 13% for boys and less than 15% for girls (Jebb, McCharthy, 2004).

Child Physical Image Perceived by Their Parents

Result showed that most parents or guardian perceived their children's body shape or type as normal (58.60%). While the others 34.50% perceived their children's body shape as skinny. Majority of the parents or guardian also perceived their child to have less body weight (61.40%). While in term of eating habit, most parents or guardian perceived their children's to eat a lot (68.30%) and some consider their child had excessive eating habit (11.00%). On the other hand, only 30 parents or guardian perceived that their child eat less or very less (20.70%). Detail analysis using Chi-square to investigate the correlation between the child body fat and physical image showed that there were significant relationship between child body fat measure with parents or guardians' perception on their child body shape body weight, and eating habit. The reported Chi-square value were X^2 (3,

$n=145$)=27.15, $p < .01$) for body shape, X^2 (3, $n=145$)=22.68, $p < .01$) for body weight and X^2 (3, $n=145$)=19.67, $p < .01$) for eating habit, respectively. The results showed that there were significant association presences between the body fat mass measured with body shape or type, body weight and eating habit. The highest associations reported were between body fat mass with parents or guardians' perception on their child body shape or type, follow with body weight, and lastly eating habit.

Discussion

Based on the body fat results, only 6% of the total subjects in this study were categories as over fat and obese, and there more girls subject as compared to the boys in this category. This indicated that primary school children who are living in the rural area in Malaysia were mostly not fat. About 11.7% of these children were reported to be in healthy body fat category. Majority of the rural area primary school children were found to be in the under fat category (less than 13% for boys and less than 15% for girls) based on the norm provided by the Tanita Cooperation, although fat mass measured using bioelectrical impedance scale was reported to be 2.4kg lower compared to measurement using Dual-Energy X-Ray Absorptiometry (DEXA). The reported fat mass value among the boys (mean 9.56) and girls (mean 12.04) will still be lower. Hence, in reality these children should be encouraged to increase their body fat mass level because if the body fat drops too low, it can have health consequences, just as when the body fat is too high. Study had reported that too low body fat percentage also can lead to deficiencies of the fat-soluble vitamins such as vitamin A, D, E and K. These vitamins can only be absorbed by the body in the presence of fat. Any deficiency of these vitamins for example can effect with your vision and can also decrease immune function (Vitamin A), the bones will become weak (vitamin d), and blood will not clot properly (Vitamin K)(McWhirter & Pennington, 1994). The *under fat* state, also a common and dangerous health circumstance associated with chronic illness and malnutrition. Common health issues related to this state will increase risk for heart disease, gastrointestinal problems, damage to nervous system, fertility issue, problems with metabolism, decrease brain function and frequent cause of fatigue among the sufferer (popkin, 1994; popkin, richards, & montiero, 1996). However, malnutrition remains a largely unrecognised problem and had become an emerging crisis especially in low income countries)(mcwhirter & pennington, 1994; popkin, 1994). Hence, parents or guardians play a very important role in maintaining their children physical image and well-being. Their perceptions and feedbacks regarding their child's body shape, weight and eating habit will surely translate to encouraging or discouraging behaviour with respect to weight

gain or reduction among their children (Golan & Weizman, 2001). Maintaining at least a certain amount of fat in the body is necessary for good health, which varies based on the gender. Hence, the ability of the parents or guardian to perceive their child physical image correctly will eventually lead to better monitoring and detecting of their child physical and weight changes in the future. In terms of perceiving their child physical image, parents or guardian were reported to perceive their child body shape or type the best, followed by the weight and eating habit. However, based on frequency results more parents or guardian can perceive their child is less body weight (61.40%), as compared to body shape or type (34.50%) and least eating habit (2.80%). Misperceive by parents or guardian pertaining to this child eating habit as a lot (99.00%) for example will make them not to encourage this child to eat more. But in reality the child is less fat and needs to consume more to avoid malnutrition. The findings of this study are in contrast with a study by Polfuss and Frenn (2012) who showed that parents could accurately distinguish their child's weight status. However, more studies found that many parents or guardian still not able to perceive the weight status of their children correctly (Baughcum, Chamberlin, Deeks, Powers, & Whitaker, 2000; Doolen et al., 2009; Eckstein et al., 2006; Maynard, Galuska, Blanck, & Serdula, 2003). This indicated that underestimation or overestimation of their child physical image is a common phenomenon among parents of overweight or underweight children, regardless of the child's gender, ethnicity or place they stay. Hence, educating the parents or guardian with the necessary skill to perceive the child physical image correctly is important because this can serve as an early phase of monitoring and detection of underweight and overweight child. Hopefully by detecting this problem early, better intervention can be carried out faster in order to lessen the problem associated with obesity and malnutrition among children.

Conclusion

Result of the study showed that parents have misperceived of their children's weight. Most of the underweight children in this study were perceived as normal. The findings of this study have imperative implications for health care professionals to make them aware of these frequent parental misperceptions. They can improve the parents' knowledge about the standard weight of children and the consequences of the underweight of their child so that treatment options can be considered. Weight and nutritional status in childhood are good predictors of wellbeing that are influenced by various variables, including parents' perception of their children body weight, eating habits and physical activity behavior, environmental, and social-cultural situation (Frisch, 1984; McCarthy, Van Eeden, & Samani-Radia, 2015; Srinivasan et al., 1996). Physical body changes such as body shape, body weight, and eating habit were the best way to monitor their child's body fat. Parental perceptions on these variables can be a good indicator to predict their behavior toward their children's overall health and eating habit (Davison & Birch, 2001; Doolen et al., 2009). However, the result from this study showed that parents or guardians perception toward their children's physical image were lacking (misperceived). Hence, empowering the parents or guardians with this skill is essential, and play a very important role in monitoring and maintaining their children in normal weight as they are able to control some of the factors, and improve healthier lifestyle changes (Golan & Weizman, 2001). In the meantime, the opposite can occur and parents can postpone the child's prosperity with respect to weight reduction (Golan, 2006).

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Table 1: Parents or guardians personal background profiles.

Education Levels	Measurement		Income (RM)	Measurement		Number of Children	Measurement	
	Frequency	%		Frequency	%		Frequency	%
Below O level	20	13.8	Less than 2000	74	51.0	1	4	2.8
O level	62	42.8	2001-3000	18	12.4	2	26	17.9
A level	15	10.3	3001-5000	30	20.7	3	39	26.9
Diploma	11	7.6	5000-10000	20	13.8	4 and 5	54	37.2
Degree and above	37	25.5	Above 10000	3	2.1	More than 5	22	15.2
Total	145	100	Total	145	100	Total	145	100

Table 2: Child body fat status based on categories (Jebb, 2004).

Body Fat Status	Boys (n = 57)			Girls (n = 88)			Total	
	Range	Frequency	%	Range	Frequency	%	Frequency	%
Under fat	Below 13%	49	86.30	Below 15%	70	79.30	119	82.10
Healthy	13.01-20.00	5	8.60	15.01-25.00	12	13.80	17	11.70
Over fat	20.01-25.00	1	1.70	25.01-29.00	1	1.20	2	1.40
Obese	25.01 above	2	3.40	25.01 above	5	5.70	7	4.80
	Mean	57	9.56	Mean	88	12.04	145	10.80

Table 3: Parents or guardian perception on their child physical image based on categories.

Body Shape Categories	Frequency	Percentage
Skinny	50	34.50
Normal	85	58.60
Fat	9	6.20
Very Fat	1	0.70
Total	145	100
Body Weight Categories		
Less Body Weight	89	61.40
Normal	10	6.90
Heavy	12	1.40
Very Heavy	12	1.40
Total	145	100
Eating Habit Categories		
Very Less	4	2.80
Less	26	17.90
A Lot	99	68.30
Excessive eating	16	11.00
Total	145	100

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