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Childhood Obesity, Self-Esteem and Health-Related Quality of Life among Urban Primary Schools Children in Kuching, Sarawak, Malaysia

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ABSTRACT

Introduction: There is limited data on childhood obesity and its impact on children from diverse cultural backgrounds. This study is aimed at determining the association between obesity, self-esteem and health-related quality of life (HRQOL) among Malaysian urban primary school children of different ethnicity. **Methods**: A cross-sectional study was conducted involving 311 children aged 11-13 years from primary schools in Kuching, Sarawak. Self-esteem and health-related quality of life (HRQOL) were measured using the Lawrence Self-esteem Questionnaire (LAWSEQ) questionnaire and the Paediatric Quality of Life Inventory (PedsQL), respectively. Body weight and height were taken and body mass index for age calculated. **Results**: The prevalence of overweight and obesity among the children were 18.2% and 15.2% respectively. Parent-proxy and child self-reported PedsQL scores were higher for normal weight children compared to thin and obese children, but lower than overweight children. At the subscale level, only parent-proxy PedsQL scores in psychosocial health and emotional component were significantly different between overweight and obese children (p=0.019, p=0.02). The Self-esteem score was significantly correlated with parent and child PedsQL scores. Although obesity was associated with lower HRQOL among children, both parent and child PedsQL scores among the overweight group were higher than that for the normal weight group. Overweight and obesity did affect quality of life and self-esteem of children in this study, particularly in the areas of psychosocial and emotional health. **Conclusion**: Policy makers and programme managers should take into consideration the impact of obesity on children and parents in designing intervention programmes.

Keywords: Overweight/obesity, self-esteem, Health-Related Quality of Life, school children

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INTRODUCTION

Following rapid economic development, lifestyle and disease patterns in Malaysia have changed, leading to the growing problem of childhood obesity (Ismail *et al.*, 2002). A survey among primary school children aged 9 to 10 years in Selangor found that the overall prevalence of overweight and obesity were 6.3% and 6.3% respectively (Anuar *et al.*, 2005). In the states of Penang and Kedah, overweight was higher among urban adolescents compared to those in rural areas (Zalilah *et al.*, 2006). Another study showed that the overall prevalence of overweight was similar among the main ethnic groups (Malays, Chinese and Indian) (Moy, Gan & Zaleha, 2004). Sumarni *et al.* (2006) reported more boys (8.9%) than girls (5.3%) were obese.

Obesity in childhood is associated with various health problems later in life. These include increased risk of coronary heart disease (Jennifer, Lina & Thorkild, 2007), type 2 diabetes, fatty liver and other obesity related complications that affect virtually every organ—ranging from crippling orthopedic problems to sleep apnea (David, 2007). There is also a heavy psychosocial toll: obese children tend to be socially isolated and have high rates of poor self-esteem, eating disorder, anxiety, and mood disorders such as depression and bipolar disorder. On reaching adulthood, they are less likely than their thinner counterparts to complete college and are more likely to live in poverty (David, 2007). Sjöberg, Nilsson & Leppert (2005) found that obesity was significantly correlated with symptoms of depression among school-aged children. Obese children are also likely to develop higher rates of feeling sadness, loneliness and anxiety, which subsequently can lead to high risk-behaviour (Strauss, 2000). Pine *et al.* (2001) also reported that children with major depression had a higher mean BMI as adults compared with healthy subjects. Obese children had significantly lower perceived athletic competence, physical appearance, and global self-worth than their normal weight peers (Franklin *et al.*, 2006). They were also found to have a lower score in their health-related Quality of Life survey scores (William *et al.*, 2005).

In Malaysia, studies on obesity in childhood are mainly on determining prevalence rates. There is comparatively fewer studies on the association between obesity and quality of life, and self-esteem. As the ethnic and cultural backgrounds of the communities in Sarawak state are very different from those in West Malaysia, we aimed to fill this information gap by determining the association between obesity and quality of life and self-esteem among primary school children.

METHODS

This is a cross-sectional study. In order to have adequate representation of the three major ethics groups (Malay, Chinese and Bumiputra Sarawak), based on a sampling frame of 67 urban primary schools in Kuching, seven residential areas were identified. Using cluster sampling method, one school in each residential area was randomly selected. For the purpose of generating data on prevalence of overweight and obese, all the children in the primary six classes from the selected schools were recruited. Parents were given an information sheet about the study and a consent form to allow their children to participate.

The sample size was determined using the formula for single proportion (EpiInfo 3.3.2, CDC, USA). Based on the overweight prevalence of a local study (6.1%) and a sampling frame of 45950, the sample size to achieve with a confidence rate of 95% was estimated to be 254, with an allowance of 5% of non-response and the precision of the prevalence of overweight chosen as 2.5%.

All the primary six school children aged 11-13 years in the selected schools had their weight and height measured for the

calculation of body mass index (BMI). This age group was chosen based on the assumption that older children (aged 11 and above) are more likely than younger children to express their perceptions correctly. Household demographic and socio-economic information was obtained from parents through self-administered questionnaires. Both students and their parents completed the questionnaire on quality of life. The self-esteem questionnaire was completed by the participants only. These questionnaires were distributed in three different languages: English, Malay and Mandarin.

Measurements of height and weight were done with the respondents in school uniform and socks. Height was measured using a Seca portable body meter. The respondents stood straight with their back facing the body meter, and the measuring beam was pulled down to rest on their heads. Height was recorded to the nearest ten of a centimetre. Body weight was measured using a Seca digital weighing scale with an accuracy of 0.1 kilogram. Body Mass Index (BMI) was calculated based on body weight in kilograms divided by the square of height in meter. For children and teens, BMI is age- and sex-specific and is often referred to as BMI-for-age. The calculated BMI was plotted onto BMI-for-age percentiles chart for gender and further classified based on WHO reference 2007 (WHO, 2007).

Health-related quality of life

To measure health-related quality of life, Malaysian-English, Malay and Mandarin translated versions of Pediatric Quality of Life Inventory™ 4.0 (PedsQL™) generic core scales and manual (Varni, Seid & Rode, 1999; Varni, Seid & Kurtin, 2001; Varni, Seid & Kurtin, 2002; Varni *et al*., 2003) were used. It is a validated 23-item questionnaire for children aged 2 to 18 years. For this study, the 8-12 version self-report scale with a five-point response scale (0=never a problem, 1=almost never, 2=sometimes, 3=often and 4=almost always) was used. The measure consisted of four generic core scales, including physical (8 items), emotional (5 items), social (5 items), and school functioning (5 items), as well as two broad domain scores (physical and psychosocial functioning) and a total general health score. The questionnaire had both children and parent-proxy versions. Scales were standardised to 0-100 scores, with higher scores indicating a better quality of life.

Self-esteem

The LAWSEQ (The Lawrence Self-esteem Questionnaire) is a 12-item validated instrument used to measure children's self-esteem. Back to back translation of the original English version of the questionnaire into Malay and Mandarin was done and validated during a pilot study. Each item consists of answers with 'yes', 'don't know' or 'no'. Based on Ternouth, Collier & Maughan (2009), answers with 'yes' were coded as 1, 'no' and 'don't know' coded as 0, and item responses summed to give a total score from 0 (high self-esteem) to 12 (low self-esteem).

All data collected were analysed using SPSS version 17.0 (SPSS Inc., Chicago). Data was cleaned for outliers and checked for normality using boxplots and Kolmogorov-Smirnov and Shapiro-Wilks statistics. Significant association using one way ANOVA, chi-square and Pearson correlation between variables was determined using inferential statistics based on a p value of less than 0.05 (2-sided).

This study was approved by the Ethical Committee of Universiti Malaysia Sarawak and the Ministry of Education, Malaysia.

RESULTS

A total of 677 students from the seven randomly selected schools were weighed and their height measured; most of the

students were girls (48.6%, n = 329). About half (50.8%, n=344) of the students were Chinese, followed by 25.3% (171) Sarawak bumiputra, 23.4% (N=158) Malays, and only 0.5% (N=3) Indian. About one-third (33.4%, n=226) had BMI-for-age at overweight and obese categories. The majority (59.5%, n=403) had normal BMI-for-age and 7.1% (48) were underweight.

Although all the students were weighed and their height measured, only a total of 311 students and their parents were recruited in this study based on the sample-size estimation. Consent was obtained from all the parents. The proportion of girls (54.7%, n=170) were found to be higher than boys (45.3%, n=141). More Sarawak Bumiputra participated in answering the questionnaires. One hundred and two students (32.8%) in this group had BMI at overweight or obese categories. The majority (59.5%) had normal BMI-for-age and 7.7% were underweight. The proportion of students who were overweight or obese was similar in comparing students who participated in answering the questionnaire with those who had not participated.

Further analysis showed a significantly higher proportion of boys who were overweight or obese compared to girls (Table 1). Although there were no significant differences in the proportion of students who were overweight or obese among the races, the mean BMI of Sarawak Bumiputra (20.17 kg / m2, SD=5.46) was higher than that of Chinese (19.26 kg / m2, SD=4.40).

The means, standard deviations, and minimum and maximum scores of the PedsQL inventory and LAWSEQ are presented in Table 2. Results show the mean score to be higher in children than parents for all subscales under PedsQL. The score for LAWSEQ was 2.86 thus indicating a higher self-esteem level.

Table 1. BMI categories by sex and ethnicity

	BMI category				*p value*[a]
	Underweight	*Normal*	*Overweight*	*Obese*	
Sex					0.012
Boys (n=348)	16 (4.6%)	194 (55.7%)	73 (21%)	65 (18.7%)	
Girls (n=329)	32 (9.7%)	209 (63.5%)	50 (15.2%)	38 (11.5%)	
Ethnicity					0.801
Malay (n=158)	10 (6.3%)	99 (62.7%)	26 (16.4%)	23 (14.6%)	
Chinese (n=344)	25 (7.3%)	208 (60.5%)	68 (19.8%)	43 (12.5%)	
Sarawak Bumiputra (n=171)	13 (7.6%)	94 (55.0%)	28 (16.4%)	36 (21%)	
Indian & others (n=4)	0 (0%)	2 (50%)	1 (25%)	1 (25%)	

[a]Chi Square test
BMI = body mass index

Table 2. PedsQL and LAWSEQ score (N=311)

Scale	*No. of items*	*Min - Max*	*Mean*	*SD*
PedsQL				
Parent proxy-report				
Total score	23	30.31-100	71.39	16.73
Physical health score	8	12.5-100	68.39	22.94
Psychosocial health score	15	30-100	72.38	16.17
Emotional	5	10-100	70.34	18.83
Social	5	15-100	77.23	19.45
School functioning	5	25-100	69.58	18.60
Chidren proxy-report				
Total score	23	40.94-100	78.14	13.99
Physical health score	8	25-100	80.16	15.76
Psychosocial health score	15	36.67-100	77.46	14.60
Emotional	5	20-100	72.75	18.39
Social	5	15-100	84.5	16.17
School functioning	5	30-100	75.13	16.48
LAWSEQ	12	0-9	2.86	1.85

PedsQL = Pediatric Quality of Life Inventory; LAWSEQ = Lawrence Self-esteem Questionnaire; SD=standard deviation

Relationship between HRQOL, self-esteem and BMI

Table 3 illustrates the results of the mean (*SD*) scores for PedsQL and LAWSEQ by BMI classification. The results showed that parents reported lower than the children in total score, physical health score, and psychological health score. Among the subscales under psychological health, only social functioning score was reported to be lower in parents compared to children. Parents with obese children reported significantly lower scores for psychosocial health and emotional scores than their children who were overweight (p=0.019, p=0.02). However, for the other subscales, the scores were not significantly different. These patterns are further illustrated in Figure 1. There was no significant difference in children's report for all subscales of HRQOL and LAWSEQ. One interesting finding was that all the scores, except for school functioning scores for children, were rated higher for overweight students and their parents than those who were underweight, normal and obese. Students who were thin rated the highest in the LAWSEQ scores.

Mean score for both parent-proxy and child self-reported total PedsQL scores across 4 weight categories were stratified by sex and race (Table 4). For both parent-proxy and child self-reported total PedsQL scores, both sex and race indicated a decrease in scores from overweight to obese categories. For other weight categories, a mixed pattern of scores was seen with half showing a decrease in mean total scores from underweight to normal categories and the other half an increase of mean total scores from normal to overweight categories. Between sex, boys reported having lower PedsQL scores than girls for both parent and child proxy. Malay respondents reported the lowest PedsQL scores and Chinese respondents had the highest. Although not significant, parents of overweight boys and girls reported better PedsQL scores than normal weight children. Despite the above results, for the post-hoc test, only PedsQL

Table 3. PedsQL and LAWSEQ scores by BMI categories

	Mean (SD)					*p value*[a]
	Whole sample	*Underweight*	*Normal*	*Overweight*	*Obese*	
PedsQL						
Parent proxy report						
Total score	71.39 (16.73)	72.78 (16.43)	71.37 (16.37)	74.67 (17.26)	66.90 (17.18)	.128
Physical health score	68.39 (22.94)	69.27 (21.27)	68.60 (23.11)	69.60 (25.08)	65.69 (20.85)	.838
Psychosocial health score	72.38 (16.17)	73.96 (15.7)	72.29 (15.52)	76.36 (17.09)	67.31 (16.91)	.041[b]
Emotional	70.34 (18.83)	72.71 (16.08)	69.92 (18.57)	75.27 (19.42)	65.00 (19.42)	.045[b]
Social	77.23 (19.45)	77.50 (20.69)	77.41 (19.27)	80.82 (17.47)	72.23 (21.26)	.172
School functional	69.58 (18.60)	71.67 (16.33)	69.54 (17.75)	73.00 (19.64)	64.68 (21.04)	.143
Child proxy report						
Total score	78.14 (13.99)	78.40 (12.10)	78.71 (14.19)	79.34 (13.26)	74.34 (14.70)	.244
Physical health score	80.16 (15.76)	81.51 (15.06)	80.93 (15.07)	80.28 (16.73)	76.33 (17.48)	.336
Psychosocial health score	77.46 (14.60)	77.36 (12.14)	77.96 (14.79)	79.03 (14.03)	73.69 (15.46)	.263
Emotional	72.75 (18.39)	71.04 (16.74)	73.46 (18.35)	74.45 (18.33)	68.83 (19.40)	.379
Social	84.5 (16.17)	85.63 (13.78)	84.32 (15.41)	87.64 (15.51)	80.96 (20.23)	.216
School functional	75.42 (16.34)	76.11 (16.02)	75.00 (15.84)	71.28 (18.87)	75.13 (16.48)	.359
LAWSEQ	2.86 (1.85)	3.54 (2.17)	2.83 (1.74)	2.60 (2.03)	2.89 (1.85)	.223

[a] one way ANOVA
[b] Post Hoc test indicated significant difference between overweight and obese group (psychosocial p=0.019, Emotional p=0.02)
PedsQL = Pediatric Quality of Life Inventory; LAWSEQ = Lawrence Self-esteem; SD=standard deviation

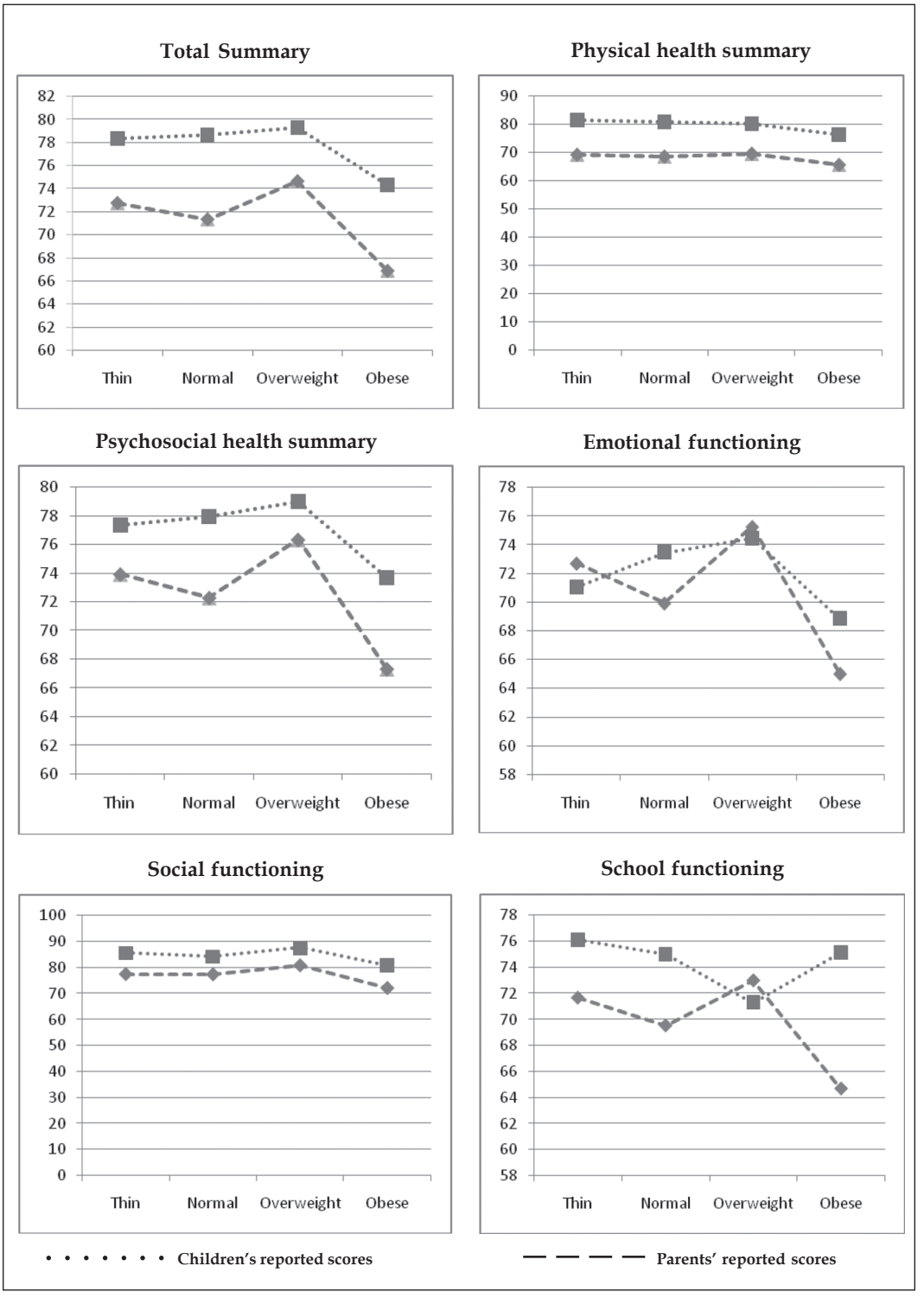

Figure 1. Children and parent-proxy reported mean PedsQL

Table 4. PedsQL and LAWSEQ scores by BMI categories stratified by potential confounding variables

	Total No. Of respondents	*Mean (SD)*					*p value*[a]
		Total	*Underweight*	*Normal*	*Overweight*	*Obese*	
				PedsQL Parent-proxy Total Score			
Sex							
Boy	141	70.49 (16.13)	75.95 (16.86)	70.41 (16.37)	73.70 (14.72)	66.04 (16.14)	.231
Girl	170	72.13 (17.22)	70.89 (16.45)	72.04 (16.41)	75.61 (19.63)	68.29 (19.14)	.551
Ethnicity							
Malay	68	65.25 (16.89)	76.33 (17.46)	63.80 (14.67)	72.29 (19.18)	53.96 (18.11)	.032[b]
Chinese	141	77.62 (13.41)	79.73 (8.78)	77.09 (13.58)	80.38 (14.31)	74.47 (13.28)	.478
Sarawak Bumiputra	101	66.89 (17.97)	61.45 (18.53)	68.37 (18.59)	65.93 (17.70)	65.76 (17.07)	.748
				PedsQL Child-proxy Total Score			
Sex							
Boy	141	76.53 (14.52)	75.73 (12.49)	78.05 (14.65)	76.13 (14.34)	73.17 (15.02)	.493
Girl	170	79.47 (13.43)	80.00 (12.00)	79.16 (13.92)	82.44 (11.56)	76.24 (14.38)	.480
Ethnicity							
Malay	68	72.33 (15.51)	76.22 (13.81)	73.15 (14.94)	71.76 (16.60)	65.94 (18.99)	.034
Chinese	141	81.89 (12.24)	85.17 (10.35)	81.79 (12.51)	83.48 (11.92)	77.79 (12.29)	.380
Sarawak Bumiputra	101	76.75 (13.81)	71.56 (9.18)	78.02 (15.03)	77.69 (10.07)	74.74 (14.18)	.551
				LAWSEQ Score			
Sex							
Boy	141	2.73 (1.87)	4.00 (2.65)	2.64 (1.61)	2.30 (2.25)	2.97 (1.74)	.099
Girl	170	2.96 (1.84)	3.27 (1.87)	2.96 (1.82)	2.89 (1.79)	2.78 (2.13)	.891
Ethnicity							
Malay	68	2.87 (1.87)	2.83 (1.72)	2.98 (1.69)	2.83 (2.66)	2.38 (1.77)	.878
Chinese	141	2.67 (1.85)	3.30 (2.67)	2.63 (1.71)	2.68 (1.98)	2.53 (1.88)	.733
Sarawak Bumiputra	101	3.10 (1.85)	4.38 (1.69)	3.04 (1.83)	2.27 (1.62)	3.36 (1.89)	.058

[a] One way ANOVA

[b] Post-hoc test indicated significant difference between overweight and obese categories (p=0.016), underweight and obese categories (p=0.013)
PedsQL = Pediatric Quality of Life Inventory; LAWSEQ = Lawrence Self-esteem; SD=standard deviation

parent proxy total scores were found to be significantly different between overweight and obese categories (p=0.032).

For LAWSEQ scores, as in the case of the PedsQL scores, overweight children showed higher self-esteem as compared to normal weight children, except for Chinese respondents. However, these differences were not statistically significant. Although boys reported lower PedsQL scores, their level of self-esteem was reported to be higher than girls. Among the races, Chinese had the highest self-esteem (2.67, SD=1.62), followed by Malay (2.87, SD=1.85) and Sarawak Bumiputra (3.10, SD=1.85).

Relationship between HRQOL scores reported by parents and children

Pearson correlation analyses showed that parents and children's scores had a low to moderate relationship for all domains (refer to Table 5). There was a significant correlation between LAWSEQ with PedsQL scores as well.

DISCUSSION

The prevalence of overweight and obesity among 12-year-old children in our study was 18.2% and 15.2% respectively which was higher than other studies in West Malaysia (Anuar *et al*., 2005; Sumarni *et al*., 2006). The prevalence of overweight and obesity in our study had exceeded the National Plan of Action for Nutrition of Malaysia II (NPANM II) targets of not more than 10% prevalence of overweight and obesity for children 6 to 12 years old by 2015 (MOH, 2005). Thus, a proper intervention and treatment programme for childhood obesity in Kuching is needed to achieve the targets of reducing the prevalence of obesity, which in turn is likely to reduce the risk of other chronic disease in adulthood.

This study found parents perceiving a lower HRQOL than children in almost all domains. Mixed results were found from previous studies (Schwimmer, Burwinkle & Varni, 2003; Jozefiak *et al*., 2008; Ostbye *et al*., 2010). Some studies indicated that parents evaluated the QOL of their children more positively compared to evaluation by their children (Schwimmer *et al*., 2003; Jozefiak *et al*., 2008). This study indicated otherwise. Other studies (Varni *et al*., 2003) had shown that parents were more concerned about their children's body weight and perceived their children's body mass index to have an effect on children's quality of life, particularly on school performance. Therefore parents tend to rate their children's QOL with lower scores, particularly if they themselves are obese. This is plausible as parents' own experiences and distress can affect the way they judge the quality of life for their children. Some children in this study had high self-reported PedsQL scores. This could be due to the fact that they might not have experienced the effects of BMI on their QOL, particularly if they had adapted to their current health status or might never have experienced a healthier life. They might have assessed their HRQOL by comparing their expectations with their experiences. Expectations of QOL are learned experiences and therefore are highly specific, varying between individuals. They are also subject to differences in social, psychological, socio-economic, demographic, and other cultural factors which may lead to structural variations in evaluations of the impact on QOL (Carr, Gibson & Robinson, 2004). The other possibility could be that the children under-report their health problems and limitations. They might try to give favourable answers rather than their actual feelings.

The parents reported significantly lower scores for psychosocial and emotional health for their children who were obese. However, the scores for other domains were not significantly different, and there was also no significant difference in children's scores for all domains. These findings were inconsistent with previous studies conducted in the United States (William *et al*., 2005; Schwimmer *et al*., 2003), which

Table 5 . Inter-correlations between HRQOL and LAWSEQ scores reported by parents and children

	PTotal	*PPhyH*	*PPsyH*	*PEm*	*PSoc*	*PSchF*	*CTotal*	*CPhyH*	*CPsyH*	*CEml*	*CSoc*	*CSchF*	*LAWSEQ*
PTotal	1												
PPhyH	.864**	1											
PPsyH	.971**	.718**	1										
PEm	.768**	.506**	.819**	1									
PSoc	.862**	.676**	.869**	.541**	1								
PSchF	.855**	.654**	.870**	.558**	.672**	1							
CTotal	.675**	.520**	.686**	.585**	.543**	.629**	1						
CPhyH	.514**	.464**	.490**	.372**	.436**	.444**	.828**	1					
CPsyH	.678**	.497**	.700**	.613**	.537**	.643**	.979**	.698**	1				
CEml	.595**	.415**	.625**	.642**	.435**	.525**	.856**	.589**	.882**	1			
CSoc	.507**	.362**	.529**	.412**	.476**	.464**	.826**	.622**	.831**	.590**	1		
CSchF	.640**	.503**	.645**	.509**	.476**	.669**	.838**	.589**	.859**	.649**	.569**	1	
LAWSEQ	-.161**	-.069**	-.189**	-.175**	-.131**	-.179**	-.283**	-.155**	-.306**	-.203**	-.346**	-.247**	1

PTotal=parent PedsQL total score; PPhyH=Parent PedsQL physical health; PPsyH=Parent PedsQL Psychosocial health; PEm=Parent PedsQL emotional; PSoc=Parent PedsQL Social; PSchF=Parent PedsQL School Functioning
CTotal=Child PedsQL total score; CPhyH=Child PedsQL physical health; CPsyH=Child PedsQL Psychosocial health; CEm=Child PedsQL emotional; CSoc=Child PedsQL Social; CSchF=Child PedsQL School Functioning

** Significant at $p \leq 0.01$

demonstrates that obese children and adolescents reported significant impairment not only in total score but also in all domains of QoL. Under subscale scores, except for the school functioning score for children proxy, all PedsQL scores indicated higher scores for overweight children compared to normal weight children. Similar patterns were found for LAWSEQ scores where overweight children had a better self-esteem level as compared to normal weight children. The reasons for the findings could be due to both respondents (children and parents) not perceving overweight as a problem. Children might even perceive being 'big size' as having an added advantages in physical and mental status, especially among the Chinese, who had the highest prevalence of overweight children.

The observation that Chinese children were overweight is probably related to culture. Chinese families tend to consume more carbohydrates and food is eaten more often than in other ethnic groups (Kasmini et al., 1997). Overeating is accepted in many Chinese families and children are brought up to show filial love by eating more in front of the parents; moreover overweight and obesity are regarded as signs for wealth and success (Zhang & Wang, 2010).

The Sarawak Bumiputra had the highest prevalence of obesity among the races and had the lowest PedsQL scores for parent-proxy and LAWSEQ. Variation in cultural concepts, health perception, parental expectations, and reporting bias can be some of the factors affecting racial differences in reporting quality of life (Ng *et al*., 2005). Sarawak Bumiputra consists of mostly Iban and Bidayuh. They were not expected to have the highest prevalence of obesity as they are socio-economically more challenged than other ethnic groups. Nevertheless, a study by Smith, Ruel & Ndiaye (2004) found a lower percentage of malnourished urban children due to a combination of more favorable socio-economic conditions such as higher household income and women's education level which seem to result in better child care practice in terms of feeding and use of health services.

Compared to a study in Singapore with similar population characteristics, this study reported lower PedsQL scores for both parent and child proxy. One possible explanation was that the prevalence of overweight and obese for this study was higher than in the Singapore study. Children with higher BMI-for-age tend to be affected more by perception and prejudice from the society and peers. Previous studies (William *et al*., 2005; Zeller & Modi, 2005) did not assess PedsQL among thin / underweight categories. Findings from this study indicate that thin children, compared to those of normal weight, had lower PedsQL, but the difference was not statistically significant. Future studies should examine this phenomenon among underweight children as it may affect their physical and mental well-being.

Our study showed a low to moderate correlation between parent and child scores for all domains which was consistent with another study (Jozekiak *et al*., 2008). The differences in the level of parent-child agreement could be affected by child's age, domains investigated, and parents' own QOL (Cremeens *et al*., 2006).

CONCLUSION

The prevalence of overweight and obesity was high among primary six school children in Kuching, Sarawak. Health-related quality of life(HRQOL) might not be able to reflect the actual feeling of obese children as other factors might affect their perception of obesity; there was also a weak correlation between parents' HRQOL scores with their children's scores. Although obesity was associated with lower HRQOL among children, both parent and child PedsQL scores among overweight group were higher than for the normal weight group. Public awareness of childhood obesity and its related health problems is important to

change the perception of children and parents. Action for the development and implementation of programmes and national policies for the prevention of childhood obesity should include increasing public awareness and aim towards change perceptions on childhood obesity among children and parents.

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The Quality of Life study described in this paper was carried out using the PedsQL, developed by Dr. James W. Varni.

REFERENCES

Anuar Zaini MZ, Lim CT, Low WY & Harun F (2005). Factors affecting nutritional status of Malaysian primary school children. *Asia-Pac J Public Health* 17(2): 71-80.

Carr AJ, Gibson B & Robinson PG (2004). Measuring quality of life. Is quality of life determined by expectations or experience? *Br Med J* 322: 1240–1243.

Cremeens J, Eiser C & Blades M (2006). Factors influencing agreement between child self-report and parent-proxy reports on Pediatric Quality of Life Inventory™ 4.0 (PedsQL™) generic core scales. *Health Qual Life Outcomes* 30: 4-58.

David SL (2007). Childhood obesity—The shape of things to come. *N Engl J Med* 357(23) : 2325-2327.

Franklin J, Denyer G, Steinbeck KS, Caterson ID & Hill AJ (2006). Obesity and risk of low self-esteem: A statewide survey of Australian children. *Pediatrics* 118(6): 2481-2487.

Ismail MN, Chee SS, Nawawi H, Yusoff K, Lim TO & James WP (2002). Obesity in Malaysia. *Obes Rev* 3(3): 203-208.

Jennifer LB, Lina WO & Thorkild IAS (2007). Childhood Body-Mass Index and the risk of coronary heart disease in adulthood. *N Engl J Med* 357(23):2329-2337.

Jozefiak T, Larsson B, Wichstrøm L, Mattejat F & Ravens-Sieberer U (2008). Quality of Life as reported by school children and their parents: a cross-sectional survey. *Health Qual Life Outcomes* [Online]. 6:34 doi:10.1186/1477-7525-6-34. Available at *http://www.hqlo.com*. [Accessed 29 March 2012].

Kasmini K, Idris MN, Fatimah A, Hanafiah S, Iran H & Asmah Bee MN (1997). Prevalence of overweight and obese school children aged between 7 to 16 years amongst the major 3 ethnic groups in Kuala Lumpur, Malaysia. *Asia Pac J Clin Nutr* 6(3):172-174.

Ministry of Health (MOH) (2005). National Plan of Action for Nutrition of Malaysia II (2006-2015). National Coordinating Committee on Food and Nutrition. Kuala Lumpur, Ministry of Health Malaysia.

Moy FM, Gan CY & Zaleha MK (2004). Body mass status of school children and adolescents in Kuala Lumpur, Malaysia. *Asia Pac J Clin Nutr* 13(4):324-9.

Ng TP, Lim LC, Jin A & Shinfuku N (2005). Ethnic differences in quality of life in adolescents among Chinese, Malay and Indians in Singapore. *Qual Life Res* 14(7):1755-1768.

Ostbye T, Malhotra R, Wong HB, Tan SB & Saw SM (2010). The effect of body mass on health-related quality of life among Singaporean adolescents : results from the SCORM study. *Qual Life Res* 19: 167-176.

Pine DS, Goldstein RB, Wolk S & Weissman MM (2001). The association between childhood depression and adulthood body mass index. *Pediatrics* 107 (5): 1049-1056.

Schwimmer JB, Burwinkle TM & Varni JW (2003). Health-related quality of life of severely obese children and adolescents. *JAMA* [Online]. 289(14):1813-1819. Available at *http://jama.ama-assn.org* [Accessed 29 March 2012]

Sjöberg RL, Nilsson KW & Leppert J (2005). Obesity, shame, and depression in school-aged children: A population-based study. *Pediatrics* 116:389-392.

Smith LC, Ruel MT & Ndiaye A (2004). Why is child malnutrition lower in urban than rural areas? Evidence from 36 developing countries [online]. Available at *http://ageconsearch.umn.edu/bitstream/16441/1/fc040176.pdf* [Accessed 29 March 2012]

Strauss R (2000). Childhood obesity and self-esteem. *Pediatrics* (105) e15.

Sumarni MG, Muhammad Amir K, Ibrahim MS, Mohd Rodi I, Izzuna Mudla MG & Nurziyana I (2006). Obesity among schoolchildren in Kuala Selangor : A cross-sectional study. *Trop Biomed* 23(2): 148-154.

Ternouth A, Collier D & Maughan B (2009). Childhood emotional problems and self-perceptions predict weight gain in longitudinal regression model. *BMC Med* [Online] 7: 46. doi:10.1186 / 1741-7015-7-46. Available at *http://www.biomedcentral.com/1741-7015-7-46*. [Accessed 29 March 2012].

Varni, JW, Burwinkle TM, Seid M & Skarr D (2003). The PedsQL™ 4.0 as a pediatric population health measure: Feasibility, reliability, and validity. *Ambul Pediatr* 3: 329-341.

Varni JW, Seid M & Kurtin PS (2001). The PedsQL™ 4.0: Reliability and validity of the Pediatric Quality of Life Inventory™ Version 4.0 Generic Core Scales in healthy and patient populations. *Med Care* 39(8): 800-812.

Varni JW, Seid M & Kurtin PS (2002). The PedsQL™ 4.0 Generic Core Scales: Sensitivity, responsiveness, and impact on clinical decision-making. *J Behav Med* 25: 175-193.

Varni JW, Seid M & Rode CA (1999). The PedsQL™. Measurement Model for the Pediatric Quality of Life Inventory. *Med Care* 37(2): 126-139.

William J, Wake M, Hesketh K, Maher E & Waters E (2005). Health-related quality of life of overweight and obese children. *JAMA* 293(1): 70-76.

World Health Organization (2007). BMI-for-age (5-19 years). Available at *http://www.cdc.gov/nccdphp/dnpa/bmi/childrens_BMI/about_childrens_BMI.htm*. [Accessed on 29 March 2012].

Zalilah MS, Mirnalini K, Khor GL, Merlin A, Bahaman AS & Norimah K (2006). Estimates and distribution of body mass index in a sample of Malaysian adolescents. *Med J Malaysia* 61(1): 48-58.

Zeller MH & Modi AC (2005). Predictors of health-related quality of life in obese youth. *Obesity* 14(1): 122-130.

Zhang Y & Wang S (2010). Prevalent change in overweight and obesity in children and adolescents from 1995 to 2005 in Shandong, China. *Asia Pac J Public Health*. 23(6): 904-916.