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RESEARCH ARTICLE

CHILDREN AND THEIR PARENT'S PERCEPTIONS OF OVERWEIGHT  
AND OBESITY IN KUWAIT CHILDREN

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ABSTRACT

**Background:** The prevalence of overweight and obesity among children are a major public health concern internationally. Recognition of overweight and obesity status is an important step to prevent unhealthy weight. This study was designed to assess the prevalence and to explore the perceptions of children and their parents towards overweight and obesity in children.

**Methods:** A cross-sectional study approach was utilized surveying 635 children aged 11 to 14 years (males and females) in 12 randomly selected public schools in Kuwait. Trained nurses performed measurements of children's height and weight to determine their Body Mass Index. Valid questionnaire were used to assess children and their parent perception of child's weight.

**Results:** One quarter of the surveyed children 25.5% ( $N = 162$ ) were overweight. Over one third of the participants 36.5% ( $N = 232$ ) were classified as obese. The nurses' measurements did not coincide with the children's perceptions but were better aligned with parents' perceptions of overweight and obesity.

**Conclusion:** The results indicated that there is high prevalence of overweight and obesity among Kuwaiti children. Furthermore, both the children and their parents underestimate the child weight status. Health education programs are highly recommended.

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INTRODUCTION

Globally, the prevalence of overweight and obesity in adolescents and children has reached epidemic proportions (WHO, 2014). In 2013, globally around 42 million of preschool aged children were found to be overweight (WHO, 2014). One of the most significant implications of overweight or obesity in children is for the tendency to track into adulthood (Biro and Wien, 2010). In addition, individuals who were overweight or obese in childhood are more likely to have adverse health consequences during adulthood (Reilly and Kelly, 2010). Recent review of overweight and obesity among children and adolescents in developed countries indicates that 22.6% of girls and 23.8% of boys were found to be overweight or obese (Ng et al., 2014). Similarly, in various developing countries the prevalence of obesity among children and adolescents was found to be the following: Brazil 22.1 %, Mexico 41.8 %, Argentina 19.3 %, and India 22.0% (Gupta et al., 2013). In Saudi Arabia the latest data indicates that the rates of childhood overweight and obesity was 23% and 9.3%

respectively (Karageorgi et al., 2013). Similarly, in Kuwaitone study among children indicated that 37% of males and 24% of females were found to be obese (Rietmeijer-Mentink et al., 2013). A subsequent study undertaken in Kuwait among adolescents found that these rates had alarmingly increased to 50.5% of boys and 46.5% of girls were overweight or obese (Park, 2011). Despite the identification of the high prevalence rates of overweight and obesity among Kuwaiti children (Rietmeijer-Mentink et al., 2013; Park, 2011; Maximova et al., 2008), there is a paucity of research studies conducted in Kuwait in regards to investigating the perception of children and their parents towards their child's weight.

The parental perception of their child's weight plays a critical role in preventing overweight or obesity in later life (Kuzma and Bohnenblust, 2005). Likewise, adolescents' perception of their own weight is an important step towards promoting a healthy weight (Onis et al., 2007; Hashemi, 2009). If parents and children perceive that they are not overweight, then they will fail to make any changes to their lifestyle. Children and adolescents who share an environment where overweight or obese is common, such as in the classroom, may develop an inaccurate perception of their actual weight.

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Seeing others that are overweight has a tendency to normalize this, which is of concern. This study, therefore, was designed to evaluate the prevalence of overweight and obesity amongst school children in Kuwait together with undertaking an assessment of the children and their parent's perception toward child body weight.

## METHODS

### Aim

The study aimed to assess the prevalence of overweight and obesity among children between the ages of 11 and 14 years in 12 randomly selected public schools in Kuwait. Further, the study aimed to explore the perceptions of parents and their children toward children's body mass index (BMI).

### Research Design

A cross-sectional study using quantitative data collection was employed. The data was gathered between February and June 2013. The methodology involved the administration of questionnaires to intermediate school students aged 11-14 years of age and to their parents. This was followed by measuring the children's height and weight to obtain their Body Mass Index (BMI) (weight/height squared). The inclusion criteria was all children who provided signed parents' consent forms.

### Data Collection

Approvals were obtained from the Ministry of Education in Kuwait and RMIT University in Australia prior to commencement of this study. Twelve public schools were selected randomly (6 boy and 6 girl schools). Approvals were then obtained from the school principals. The researcher visited each school and met with the school principals and teachers to further inform them of the protocols of the study and to identify a convenient time to collect data as suggested by the teachers and the school principals. A total of 960 envelopes were distributed to the students aged 11-14 years (480 boys and 480 girls) attending the 12 randomly selected schools to take home. The envelope contained the parents' information sheets written in plain language explaining the study, consent forms that needed to be signed by the parent and two questionnaires, one for the parent and one for the students to be completed. The signed consent forms and the completed questionnaires were returned by the students the next day. All students who had the signed consent forms and the completed questionnaires were directed to the researcher who checked that all documents were complete and then directed the students to another classroom where the nurses were waiting to perform their measurements.

### Anthropometric measurements

The children's Body Weight Index (BMI) was defined according to the World Health Organization for boys and girls aged between 5 to 19 years old (Onis *et al.*, 2007). The registered nurses from the Health Department undertook the children's heights and weights measurements. Female nurses

measured the height and weight of female students and male nurses measured male students. The involvement of the nurses was important because they were trained in accurately measuring the heights and weights and in calculating the BMI scores of the students. The measurements were performed by the nurses in a private classroom room in the school to ensure confidentiality and privacy to the child.

### Parents and children perception

The participants perceptions were evaluated through valid questionnaires adopted from the literature (Al-Isa *et al.*, 2010; El-Bayoumy *et al.*, 2009). For the student's perception of their weight, they were asked how they would describe their weight. For this question there was a number of pre determined responses which described their perception of their own weight. Children needed to select one of these answers, in order to assess their own perception of their actual weight. For the parental perception, multi questions were asked to assess their perception of overweight and obesity and their perception of their child body weight. The questions included: "How do you rate your child's body weight?", "Do you think that your child might have a weight problem?" Parents were also asked to respond to the following statement "*Overweight children are unhealthy*"

### Data analyses

Data was analysed using SPSS, Version 20.0. The descriptive statistics included cross tabulations between variables, measures of frequency distribution, means and standard deviation to determine the prevalence of overweight and obesity. Multifactorial analysis of variance (ANOVA) was used in this study as the most appropriate multivariate method to determine if the mean values of dependent variables varied with respect to two or more categorical variables. Kappa statistics were computed to determine the level of agreement between the children's perception of their BMI categories, and the actual BMI categories based on the nurses' computations. A negative kappa statistic at  $p$ -value  $\leq 0.05$  indicated a non-agreement chance between the two groups.

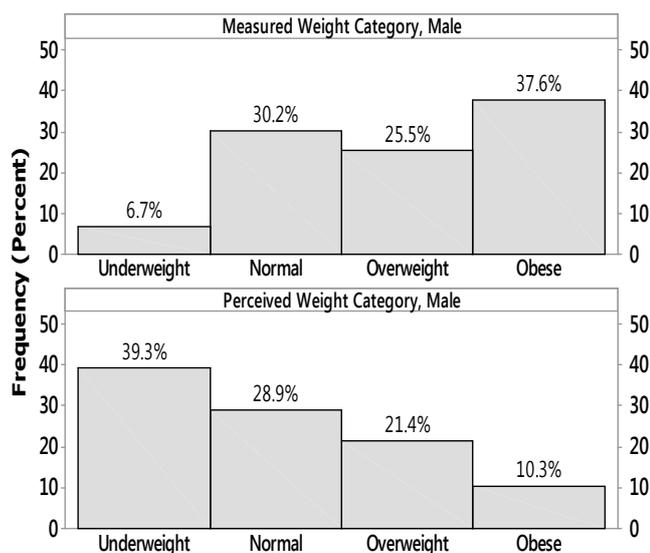
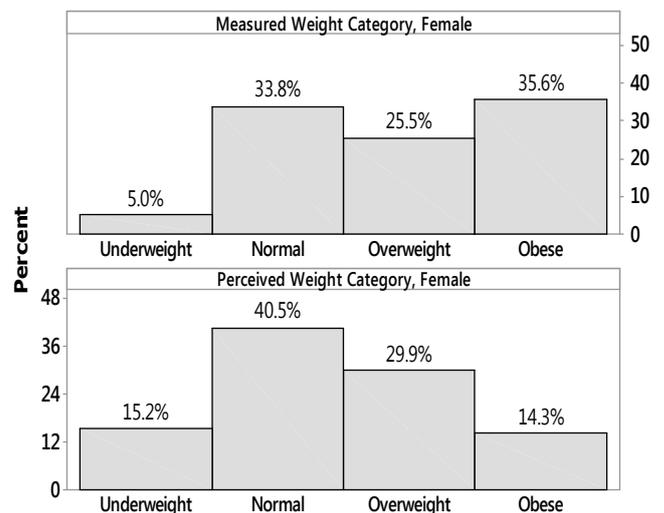
## RESULTS

A total of  $N = 635$  of parents and their children provided responses, the response rate being 66%. Table 1 summarizes the frequency distributions of children's age and sex. The male-female ratio was almost 1:1, with ( $N = 298$ ) 46.93% male children, and ( $N = 337$ ) 53.07% female children. The children's ages ranged from 11 to 14 years, but most children ( $N = 414$ , 65.20%) were 13 or 14 years old; with a mean of  $12.89 \pm 1.04$  ( $SD$ ) years old. ANOVA results showed that there was a significant difference in the BMI values of children when grouped according to age ( $F = 6.28$ ,  $p < 0.05$ ). However, the effect size was only 0.029, indicating that 2.9% of the total variation in BMI of children could be accounted for by age. On the other hand, the mean BMI difference between male and female was not proven to be significant, with almost negligible effect size of 0.02%.

**Table 1. Children's Age, Sex and Body Weight Characteristics**

		Sex					
		Female		Male		Total	
		N	%	N	%	N	%
Age (Years)	11	57	16.91	22	7.38	79	12.44
	12	76	22.55	66	22.15	142	22.36
	13	90	26.71	93	31.21	183	28.82
	14	114	33.83	117	39.26	231	36.38
	Total	337	100.00	298	100.00	635	100.00
BMI Categories	Underweight	17	5.04	20	6.71	37	5.83
	Normal	114	33.83	90	30.20	204	32.13
	Overweight	86	25.52	76	25.50	162	25.51
	Obese	120	35.61	112	37.58	232	36.54
	Total	337	100.00	298	100.00	635	100.00

Based on the BMI measurements drawn from the sample of 635 children, of whom 232 subjects were classified as obese and 162 were overweight, the true prevalence of obesity among children aged 11 to 14 was estimated to be 36.54% (95% CI = 32.78%, 40.29%), while prevalence of overweight was estimated to be 25.51% (95% CI = 22.11%, 28.91%). The normal approximation to binomial distribution was used to obtain the confidence intervals for estimated prevalence values. Children's Perception of Their Body Weight was designed to collect data on perceived body weight with a response rate of 97.3% (N = 618). The responses indicated that 26.54% of those who replied perceived themselves to be underweight (compared to 5.99% underweight); 35.11% perceived themselves to be about the right weight (compared to 32.36% normal weight); 25.89% perceived themselves to be slightly overweight (compared to 25.73% overweight) and 12.46% perceived themselves to be very overweight (compared to 35.92% obese). See Figures 1 and 2 for details. A Kappa Statistic (= -0.084,  $p < 0.05$ ), indicated that there was a statistically significant non-agreement between actual assessment on weight category and children's perception of their weight. Also, the statistically significant kappa measures of agreement/disagreement between perceived and actual body weight indicated that such disagreement was higher among females ( $K = -0.11$ ,  $p < 0.05$ ) compared to males ( $K = -0.05$ ,  $p < 0.05$ ).

**Figure 1. Comparison of measured and perceived body weights in male children****Figure 2. Comparison of measured and perceived body weights in female children**

Parents' Perception of Children's Body Weight: The responses to the questions concerning the parents' perceptions of their children's body weight are presented in Table 2. Most of the parents strongly agreed (N = 399, 62.8%) with the item "What is your opinion of the statement: "Overweight children are unhealthy"? The parents perceived that over one third of their children (N = 225, 35.4%) were overweight or obese. A similar proportion of the parents (N = 228, 35.9%) thought that their child had a weight problem. The parents' perceptions of their children's body weight indicated that there was a statistically significant difference between their perception of their child's body weight and the actual children's measured BMI categories as indicated by kappa statistic result ( $K = 0.16$ ,  $p < 0.05$ ).

**Table 2. Parents' Perception of Body Weight**

		Girls		Boys		Total	
		N	%	N	%	N	%
What is your opinion of the statement: "Overweight children are unhealthy"?	Strongly Agree	223	66.2	176	59.1	399	62.8
	Agree	82	24.3	85	28.5	167	26.3
	Disagree	14	4.2	16	5.4	30	4.7
Parents' perception of children's body weight	Strongly Disagree	6	1.8	8	2.7	14	2.2
	Disagree	12	3.6	13	4.4	25	3.9
	Missing	34	5.4	43	6.8	77	12.1
Parent thinks child has weight problem	Underweight	165	26.1	164	26.0	329	51.8
	Normal	108	17.1	76	12.0	184	29.0
	Overweight	27	4.3	14	2.2	41	6.5
	Obese	133	20.9	95	15.0	228	35.9
	Yes	204	32.1	203	32.0	407	64.1
	No						

## DISCUSSION

The results from this study indicated that the prevalence of overweight and obesity among children aged 11 to 14 was 25.51% and 36.54%, respectively. The result also indicated that there was no statistical significance between female and male children on prevalence of overweight and obesity with almost negligible effect size of 0.02%. In addition, most of the parents in this study strongly agreed (N = 399, 62.8%) with the statement that overweight in children are unhealthy.

However, parents perceptions of their children's body weight was found to be statistically significant but had a low agreement with their children's measured BMI categories, as indicted by kappa statistic result ( $K = 0.16$ ,  $p < 0.05$ ). On the other hand, both female and male children underestimated their weight, with higher disagreement among females ( $K = -0.11$ ,  $p < 0.05$ ), compared to males ( $K = -0.05$ ,  $p < 0.05$ ). In comparing the results of this study with recent and previous studies conducted in Kuwait, the rate of overweight and obesity among children and adolescents is higher and therefore getting worse with no signs of improvement (Rietmeijer-Mentink *et al.*, 2013; Park, 2011; Al Junaibi *et al.*, 2012; Rizk and Yousef, 2012). For example, in 2010 the prevalence of overweight and obesity among school children indicated that 20.2% were overweight and 16.8% were obese (Al Junaibi *et al.*, 2012), while a more recent study conducted by Al-Haifi and colleagues (2013) among adolescents indicated that 50.5% of males and 46.5% of females were overweight or obese. This is even more alarming considering that the results from this study were for 13 to 14 year old children and therefore narrower age range compared to other studies.

Moreover, in neighboring countries, the prevalence of overweight and obesity among children and adolescents have been reported on in United Arab Emirates (14.7% were overweight and 18.9% were obese) (Musaiger *et al.*, 2012), and in the Saudi Arabia among children (23% were overweight and 9.3% were obese) (Karageorgi *et al.*, 2013). However, of the prevalence rates of overweight and obesity among children in the Arab speaking countries, Kuwait ranked amongst the highest among children or adolescents (Al-Baghli *et al.*, 2008; Ng *et al.*, 2011). In the present study, despite the high rate of overweight and obesity, both children and their parents were found to underestimate the actual weight of their children. Similar results were found in a previous study conducted in Kuwait. For example, study by Al-Qaoud and colleagues (2010) found that the majority of mothers with overweight children in Kuwait incorrectly perceived their children body weight. Furthermore another study in Kuwait revealed that parents tended to underestimate the body size of their children rather than overestimate the child's weight. In addition, 42.4% of overweight or obese children perceived themselves as thin or normal, with this being more prominent in females than males (Hussin *et al.*, 2011).

Similarly, this study found that the misperception of actual weight was higher in female compared to male children. This is further supported by the literature which indicated, that female children are more likely to underestimate their weight compared to male children (Economos *et al.*, 2014). Globally, children's misperception of their body weight was reported in the United States of America (Chen *et al.*, 2014), Canada (Economos *et al.*, 2014), and United Arab Emirates (Musaiger *et al.*, 2012). On the other hand, parent perception of child weight, according to a recent systematic review of 51 studies, found that approximately 63.4% of parents failed to recognize overweight among their children (Rietmeijer *et al.*, 2013). Not surprisingly, Chen and colleagues (2014) found in their study that misperception is more likely to occur when children are overweight rather than obese. The significance of this finding is that parent's awareness of their child being

overweight is more likely to involve some action towards weight loss measures. If the parents perceive that their child is not overweight, despite actually being overweight, they are unlikely to undertake weight loss strategies, such as alter diet and encourage exercise. Hudson and colleagues (2012) identified that the child's age, gender and parent weight status are all factors that could affect parents' perception of overweight children. The other concerning side to this is the fact that the parents in this study were able to identify that overweight children are unhealthy, yet failed to recognize that their own child was overweight. Therefore, making children and parents aware of accurate weight perception is a necessary step to prevent and treat overweight and obesity in children. As indicated in the literature, parents fail to identify that their children were overweight (Hashemi, 2009). There is a need to be aware of being overweight in order to take action to lose weight as this tends to be the main motivator to weight loss attempts. More research needs to be undertaken in order to ascertain what factors contribute to children's and parent's misperceptions about their weight. There is a need for significant involvement of children and parents in programs to correct weight perception, as indicated by Chen and colleagues (2014). The intervention to correct the weight perceptions needs to come directly from the children by promoting their knowledge related their body weight.

### Significant and contribution of this study

The findings of this study confirmed that the obesity and overweight rates in Kuwait remain high and at alarming figures. The study's findings in Kuwait highlighted that children and their parent underestimate the actual weight.

### Recommendation

The implementation of intervention programs promoting the knowledge of school children and their parents toward children's weight is highly recommended. Encouraging schools to undertake Body Mass Index screening through the school nurse and involve school nurse in health education is an important step in these intervention programs. It is also important to inform the child and their parents what the results are and identify those children who are overweight or obese. In addition, further research is needed to explore the factors that affect parents and children's perceptions of their weight in order to develop intervention programs that focus on children overweight and perception in Kuwait.

### Conclusion

This study has identified that there is a high prevalence of children in Kuwait who are overweight and obese. The study also discovered that both the children and parents tended to underestimate their child's weight status. These findings indicate a clear health promotion target for reducing the prevalence of overweight and obesity in school aged children. Increasing awareness of healthy weight in children and their parents will play an important role in the treatment and prevention of overweight and obesity among children and parents in Kuwait.

## Conflict of interest

The authors declare that they have no conflict of interest.

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