

CHILDHOOD OBESITY: PREVALENCE, RISK FACTORS AND LIFESTYLE BEHAVIOUR AMONG PRIMARY SCHOOL MALE CHILDREN IN AL-MADINAH AL- MUNAWARAH, SAUDI ARABIA

Awad Al-Qahtani, Riyadh Al-Al-Ghamdi, 1 Khalid Al-Ghamdi

Joint program of Family Medicine, Saudi Board of Family Medicine (SBFM), Al-Madinah Al-Munawarah, Saudi Arabia

Correspondence to: Awad Al-Qahtani (dr,awad2009@hotmail.com)

DOI: 10.5455/ijmsph.2013.010920131

Received Date: 31.08.2013

Accepted Date: 01.09.2013

ABSTRACT

Background: Childhood obesity is currently a major health problem in many countries of the world.

Aims & Objective: This study aimed to determine the prevalence of obesity and describe the risk factors among primary school male children in Al-Madinah Al- Munawarah, Saudi Arabia. It is our intension that these data can be useful in planning appropriate intervention programs targeting school children.

Material and Methods: This is a cross sectional descriptive study included 197 primary-school children aged 9 to 14 years living in Al-Madinah Al- Munawarah city. A structured questionnaire was constructed to collect information from the subjects. After an interview and a review of clinical examination records, height and weight were measured.

Results: In this study, 49 (24.9%) of 197 children were obese and 30 (15.2%) were overweight. Food consuming behaviors were strongly associated with childhood obesity in the variables "eating too much" ($p = 0.001$), "arguing if say enough or stop eating" ($p < 0.001$), "demanding food while still eating" ($p = 0.001$) and "demanding food between meals" ($p = 0.021$). Personality behavioral variables were strongly associated with childhood obesity in the variables "complaint being overweight" ($p < 0.001$), "complaint being unattractive" ($p < 0.001$), "complaint being not fitting in clothes" ($p < 0.001$), "complaint being teased" ($p = 0.009$).

Conclusion: The prevalence of overweight and obesity among primary school children in Al-Madinah Al- Munawarah is high. Multiple strategies and interventions are warranted to prevent overweight and obesity related risk behavior in school-aged children.

Key-Words: Childhood Obesity; Risk Factors; Lifestyle Behaviour; Saudi Arabia

Introduction

Childhood obesity is a complex, multi-factorial serious medical condition defined as an excessively high amount of body fat or adipose tissues in relation to lean body mass.^[1] The body mass index (BMI) is the most widely used measure of obesity. Body mass index in childhood changes substantially with age. However, clear cut off point are still needed to define obesity in children.^[2]

The causes of paediatric obesity have not been elucidated completely, although it is suspected that a complex interaction of genetic, environmental, and behavioural factors is responsible.^[3] Childhood obesity is an increasing health concern that is strongly associated with chronic health problems persisting into adulthood^[4] and cause severe consequences on adult health^[3]. Metabolic syndrome, diabetes type 2 and sleep apnoea syndrome are becoming more

common in obese adolescents.^[5] Obesity can affect the dyslipidaemic syndrome, arterial hypertension and glucidic metabolism disorders.^[6] Several cardiovascular risk factors and non-alcoholic fatty liver disease are also noticed among obese children.^[7]

Obesity is currently an escalating epidemic that affects many countries in the world including the Arabian Gulf region. This increase in the prevalence of obesity is due to life style changes (physical activity, leisure, and modernization) and nutrition transition which are in relation with changing economic, social, and health factors.^[8] It is well known that Arabian Gulf countries moved toward the higher fat and higher refined carbohydrates Western diet^[8] Major dietary changes include a large increase in the consumption of fat and added sugar in the diet, and often a marked increase in animal food products which is contrasted with a fall in total cereal intake, vegetable, and fruits consumption.^[5]

The increasing rates are a result of changing lifestyles and industrialization with the associated increasing rate of television viewing and playing with computer games, consumption of high calorie and high fat foods coupled with low levels of energy expenditure in the form of low physical activity.^[9]

This study aimed to determine the prevalence of obesity and describe the risk factors among primary school male children in Al-Madinah Al-Munawarah, Saudi Arabia. It is our intension that these data can be useful for health policy makers, educators and other stakeholders in planning appropriate intervention programs targeting school children.

Materials and Methods

This was a cross sectional descriptive study with a sample of 197 male primary-school children aged 9 to 14 years living in Al-Madinah Al-Munawarah city. Al-Madinah Al-Munawarah is the second holy city to Moslems after Makkah Al-Mukkaramah with a 170 primary schools in which there are 37000 students.^[10] Assuming 15% obesity/overweight^[11] with a confidence level of 95% and maximum marginal error of about 0.02, the sample size was calculated as 195. Multistage stratifying clustering sample technique has done in four stages: First, Stratifying Al-Madinah into developed and less developed district area based on the socioeconomic class people living at that area. Second, selecting randomly one school from each of the above strata. Third, selecting one class from each level randomly. Finally, Cluster sampling of all children in the selected class.

A structured questionnaire was constructed to collect information from the subjects. The questionnaire containing 25 items in addition to the demographic information called lifestyle behavioural checklist (LBC); a measure of weight-related problem behaviour in obese children, adopted from West and Sanders.^[12] After an interview and a review of clinical examination records, height and weight were measured. Body weight was assessed using a digital Seca scale while the children were wearing light clothing with no shoes. Standing height was measured without shoes using a portable stadiometer. The

reliability of measurements of height and weight were assessed by repeated measurements on the same student with an intra-class correlation coefficient of > 0.95. Body mass index (BMI) was calculated as weight (kg) divided by the square of the height (m) (kg/m²).

The data were analysed using SPSS 17 for Windows (SPSS Inc, USA). Numerical data has been presented as mean and standard deviation. Categorical data has been presented as frequency and percentage then appropriate statistical tests has been used. P-values of < 0.05 were considered significant.

Results

We studied a total of 197 male primary-school children. The children were between 9 and 14 years of age, with a mean age of 11.42 years and a standard deviation of ± 1.04 years. Of these children, 49 (24.9%) were obese and 30 (15.2%) were overweight. Considering the education level of parents, 4 (2%) fathers and 8 (4.1%) mothers were illiterate, while 86 (43.7%) fathers and 81 (41.1%) mothers were highly educated (university graduate or above education) as presented in figure 1.

To explore the possible risk factors for obesity, the response of the 49 obese children to lifestyle behaviour variables in this study was recorded and presented in table 1. The correlation of obesity and behavioural variables which enhance the risk of obesity among the 49 obese children in this study is presented in table 1. Food consuming behaviours were strongly associated with childhood obesity in the variables "eating too much" ($p = 0.001$), "arguing if say enough or stop eating" ($p < 0.001$), "demanding food while still eating" ($p = 0.001$) and "demanding food between meals" ($p = 0.021$). No significant association with obesity was found for other variables.

In this study, personality behavioural variables were strongly associated with childhood obesity in the variables "complaint being overweight" ($p < 0.001$), "complaint being unattractive" ($p < 0.001$), "complaint being not fitting in clothes" ($p < 0.001$), "complaint being teased" ($p = 0.009$). No significant association was found for "complaint being not have friends" ($p = 0.495$).

Table-1: Association between Risk Behavioural Variable and Obesity of the 49 Obese Children

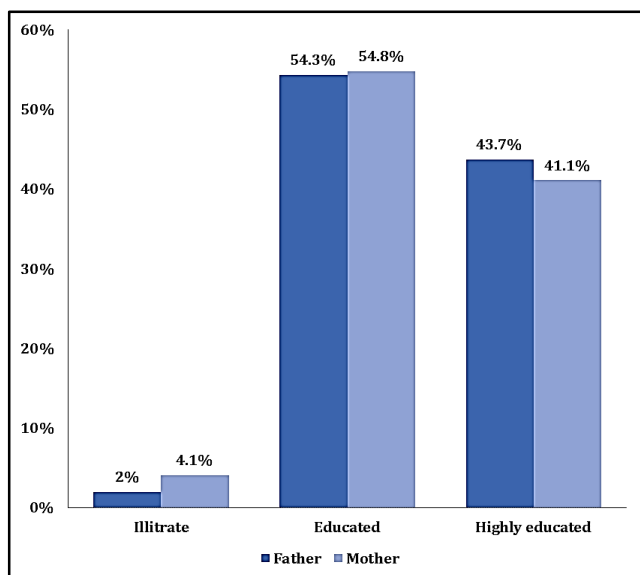
Risk Behavioural Variable of Obesity	Not at all		A little		Some what		Much		Very much		p-value
	N	%	N	%	N	%	N	%	N	%	
Eat fast	15	30.6	13	26.5	16	32.7	4	8.2	1	2.0	0.116
Eats to much	9	18.4	15	30.6	18	36.7	4	8.2	3	6.1	0.001**
Eats unhealthy snacks	7	14.3	13	26.5	18	36.7	9	18.4	2	4.1	0.469
Complaint about food	21	42.9	11	22.4	10	20.4	5	10.2	2	4.1	0.825
Screams about food	33	67.3	6	12.2	5	10.2	3	6.1	2	4.1	0.063
Utters bad words for food	39	79.6	3	6.1	4	8.2	3	6.1	0	0.0	0.252
Refuse some foods	5	10.2	18	36.7	11	22.4	7	14.3	8	16.3	0.228
Argue if say enough or stop eating	20	40.8	12	24.5	9	18.4	4	8.2	4	8.2	<0.001**
Demand food while eating	21	42.9	14	28.6	10	20.4	1	2.0	3	6.1	0.001**
Demand food between meals	17	34.7	17	34.7	9	18.4	3	6.1	3	6.1	0.021**
Request food when shopping	8	16.3	14	28.6	18	36.7	5	10.2	4	8.2	0.532
Sneak food when they know they not supposed to be	27	55.1	10	20.4	9	18.4	1	2.0	2	4.1	0.113
Hides food	33	67.3	11	22.4	2	4.1	1	2.0	2	4.1	0.098
Snatch food from children tiffin	44	89.8	2	4.1	0	0.0	2	4.1	1	2.0	0.097
Eat food to comfort when aggressive	42	85.7	2	4.1	4	8.2	-	-	1	2.0	0.164
Watch TV too much	7	14.3	7	14.3	20	40.8	8	16.3	7	14.3	0.360
Spent too much time in video/computer games	6	12.2	9	18.4	21	42.9	3	6.1	10	20.4	0.243
Complaint about physical activity/work	14	7.1	16	8.1	10	5.1	4	2.0	5	2.5	0.001**
Refuse to do physical activity	30	61.3	5	10.2	11	22.4	1	2.0	2	4.1	0.253
Complaint being unfit or feeling low in energy	22	44.9	11	22.4	10	20.4	2	4.1	4	8.2	<0.001**

* Pearson Chi-square test; ** Significant

Table-2: Association between Personality Behavioural Variable and Obesity of the 49 Obese Children

Personality Behavioural Variable of Obesity	Not at all		A little		Some what		Much		Very much		p-value
	N	%	N	%	N	%	N	%	N	%	
Complaint being over weight	21	42.9	12	24.5	6	12.2	3	6.1	7	14.3	<0.001**
Complaint being teased	26	53.1	11	22.4	5	10.2	3	6.1	4	8.2	0.009**
Complaint being not have friends	41	83.7	6	12.2	1	2.0	-	-	1	2.0	0.495
Complaint being unattractive	35	71.4	3	6.1	5	10.2	1	2.0	5	10.2	<0.001**

* Pearson Chi-square test; ** Significant

**Figure-1: Education Level of Parents of the Study Children**

Discussion

Obesity is becoming a worldwide problem affecting all levels of society and is thus being described as a global epidemic.^[13] The prevalence of childhood obesity is high in the Middle Eastern, Central and Eastern European countries.^[14] In Saudi Arabia, one in every six children aged 6–18 years old is obese.^[15]

The prevalence of obesity and overweight in current study were 24.9% and 15.2% respectively. In previous Saudi studies the prevalence of obesity ranged from 14% in children to about 83% in adult.^[15,16] This wide variation could be due to the differences in criteria used to define obesity and also to the differences in age, sex, and health status.

It is difficult to correlate nutritional choices and childhood obesity using observational research. However, trend data suggest some changes in eating patterns and consumption that may be correlated with increases in obesity.^[17] In this study, a significant correlation was found between some variables of food consuming behaviour. Ashton ^[18], highlighted that advertising influenced dietary and other food choices in children, which likely contributed to energy imbalance and weight gain. Several studies indicated the association between less healthy eating habits and obesity in children.^[19,20] The positive association of dietary unhealthy habit with obesity and overweight was also noted in this study.

It has been hypothesized that a steady decline in

physical activity among all age groups has heavily contributed to rising rates of obesity all around the world. The current study results showed a significant correlation between physical inactivity and obesity. Stone et al.^[21] reviewed the impact of 14 school-based interventions on physical activity knowledge and behaviour. Most of the outcome variables showed significant improvements for the intervention.

Numerous studies have shown that sedentary behaviours like watching television and playing computer games are associated with increased prevalence of obesity.^[22,23] The American Academy of Paediatrics recommends that parents limit children's total entertainment media time (primarily television and videos games) to no more than two hours of quality programming per day. Television viewing is discouraged for children younger than two years of age.^[24] Concerns about television viewing relevant to childhood obesity include displacement of more physically active behaviours and exposure to promotion of high-calorie/low-nutrient foods. Veldhuis et al.^[25] reported that watching TV more than recommended appeared to be a risk factor for having obesity, independent of the other lifestyle-related behaviours. In contrast, the results of this study showed no correlation between obesity and watching TV or spending times in playing video games or computer games. However, the duration of spending times in watching TV or playing video games was not specified in this study.

Overweight and obesity in childhood are known to have significant impact on both physical and psychological health and this is well demonstrated in this study where the study obese and overweight children complain about being tease or unattractive.

Conclusion

Conclusively, the results of this study showed a high prevalence of overweight and obesity among male primary school children in Al-Madinah Al-Munawarah. Multiple strategies and interventions are warranted to modify food habits, education through mass media and encouraging habitual physical activity among male primary school

children in Al-Madinah Al-Munawarah city. Reducing overweight and obesity will lead to increased health equity in Saudi Arabia.

References

- Centers for Disease Control and Prevention, Atlanta. Childhood overweight and obesity. [Updated 2012 April 27]. (cited 2013 June 25). Available from URL: <http://www.cdc.gov/needphp/dupa/obesity/defining.html>.
- Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity world-wide: International Survey. *BMJ*. 2000; 320: 1240-1243.
- Rolland-Cachera MF. Childhood obesity: current definitions and recommendations for their use. *Int J Pediatr Obes*. 2011; 6: 325-331.
- Bibeau WS, Moore JB, Caudill P, Topp R. Case study of a transtheoretical case management approach to addressing childhood obesity. *J Pediatr Nurs*. 2008; 23: 92-100.
- Malecka-Tendera E, Mazur A. Childhood obesity: a pandemic of the twenty-first century. *Int J Obes*. 2006; 30 (Suppl 2): S1-S3.
- Novac O, Matasaru S, Tataru S, Felea D, Cosmescu A, Chiosac AA. Assessment of complications of excess weight in school-age children and adolescents. *Rev Med Chir Soc Med Nat Iasi*. 2009; 113: 740-744.
- Al Isa AN. Dietary and socio economic factors associated with obesity among Kuwaiti college men. *Br J Nutr*. 1999; 82: 369-374.
- Kim S, Moon S and Popkin BM. The nutrition transition in South Korea. *Am J Clin Nutr*. 2000; 71: 44-53.
- Veugeliers PJ, Fitzgerald AL. Prevalence of and risk factors for childhood overweight and obesity. *Canad Med Asso J*. 2005; 173: 607-613.
- Ministry of Education, Primary Schools in Al-Madinah Al-Munawarah. 18-3-2012 (Personal Communication).
- Mozafari H, Nabaei B. Prevalence of obesity and overweight in Tehranian girls' student of primary schools. *UnivJahad Quart Pub Health Sci: (Tehran/Iran)*. 2002; 1:15-19.
- West F and Sanders MR. The Lifestyle Behaviour Checklist: a measure of weight-related problem behaviour in obese children. *Int J Pediatr Obes*. 2009; 4: 266-273.
- WHO. Global prevalence and secular trends in obesity. Epidemic report of WHO Consultation on Obesity. WHO; 1998: 17-40.
- James PT. Obesity: The worldwide epidemic. *ClinDermatol*. 2004; 22: 276-280.
- Al Nuaim AR, Bamgboye EA, Al Herbish A. The pattern of growth and obesity in Saudi Arabian male school children. *Int J Obes Relat Metab Disord*. 1996; 20: 1000-1005.
- Madani KA, Al-Amoudi NS, Kumosani TA. The state of nutrition in Saudi Arabia. *Nutr Health*. 2000; 14: 17-31.
- Lin BH, Guthrie J, Frazao E. 1999b. Quality of children's diets at and away from home: 1994-96. *Food Review* 2-10.
- Ashton D. Food Advertising and Childhood Obesity. *J Roy Soc Med*. 2004; 97: 51-52.
- Nicklas TA, Baranowsky T, Cullen KW, Berenson G. Eating pattern, dietary quality and obesity. *J Am Coll Nutr*. 2001; 20: 599-608.
- Gillis LJ, Bar OO. Food away from home, sugar-sweetened drink consumption and juvenile obesity. *J Am Coll Nutr*. 2003; 22: 539-545.

21. Stone EJ, McKenzie TL, Welk GJ, Booth ML: Effects of physical activity interventions in youth. Review and synthesis. *Am J Prev Med.* 1998, 15: 298-315.
22. Swinburn B, Egger G: Preventive strategies against weight gain and obesity. *Obes Rev* 2002, 3:289-301.
23. Tremblay MS, Willms JD: Is the Canadian childhood obesity epidemic related to physical inactivity? *Int J Obes Relat Metab Disord.* 2003, 27:1100-1105.
24. American Academy of Pediatrics, Committee on Public Education. Children, Adolescents, and Television. *Pediatr.* 2001; 107: 423-426.
25. Veldhuis L, Vogel I, Renders CM, Rossem L, Oenema A, Sing R , et al. Behavioral risk factors for overweight in

early childhood; the 'Be active, eat right' study. *Int J Behav Nutr Phys Activ.* 2012, 9:74.

Cite this article as: Al-Qahtani A, Al-Al-Ghamdi RA, Al-Ghamdi KS. Childhood obesity: Prevalence, risk factors and lifestyle behaviour among primary school male children in Al-Madinah Al- Munawarah, Saudi Arabia. *Int J Med Sci Public Health* 2013; 2:1085-1089.

Source of Support: None

Conflict of interest: None declared