ORIGINAL ARTICLE

Overweight, Obesity and Related Factors in 7 to 11-year-Old Female Students in Robat-Karim, Iran in 2014.

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Abstract

Objective: In recent years, the prevalence of overweight and obesity had a significant growth in children. Obesity is a serious health problem all over the world. In this study, we aimed to determine the prevalence of overweight and obesity in elementary students in Robat-Karim, Iran in 2014.

Materials and Methods: This cross-sectional study was conducted on 490 female students of elementary school aged between 7 to 11 years in Robat-Karim, Iran in 2014. The percentages of Centers for Diseases Control and Prevention growth charts (CDC) have been utilized to determine overweight and obesity. SPSS-16 software has been applied for statistical analysis.

Results Mean age of the students was 8.97+ 1.38 years. According to CDC, 28 (5.7%) of the students were obese, and 75 (5.78%) of the students were overweight. Overweight and obesity were significantly related with birth weight, body mass index(BMI) of parents, and time spent for watching TV, computer games and other electronic entertainments (P <0.001).

Conclusion: According to obtained results, interventional programs should be done to correct life-style and prevent overweight and obesity among elementary school students.

Keywords: Overweight, Obesity, Elementary school.

Introduction

Changing in lifestyle causes non-communicable diseases (NCD) prevalent such as diabetes and cardiovascular disease (1). It is predicted 60% of all diseases and their mortality is related to NCD in developing countries by 2020. Obesity is considered as an important risk factor for most of NCD (2). In recent years, the prevalence of overweight and obesity had a significant growth in children. Obesity is a

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serious health problem all over the world (3). Obesity in childhood and adolescence represented as a strong predictor of adult obesity. Adult obesity is about 2 to 3 times more prevalent in obese than non-obese children (4-5). Obesity in childhood and adolescence is important not only for the physical and psychological consequences, but also for the increased incidence of diseases, mortality and burden on society (6).

The obesity increases risk of some diseases such as cardiovascular disease, type 2 diabetes, cancers, hypertension, hyperlipidemia, stroke and liver diseases (7). The prevalence of obesity and overweight in the 5 to 11year old Canadian children were 13.1 % and 19.7 % between 2009 and 2011, respectively (8). Furthermore, the prevalence of obesity in 6 to 11year old children was 18 % between 2009 and 2010 in the US (9). In Iran, the prevalence of obesity in children was reported between 1.2 % and 21.08 % (10-13). There are various factors considered as the main reasons of children obesity such as race, ethnicity, parental obesity, physical inactivity, eating fast foods and long term watching TV (14-16). It seems that identifying children overweight and obesity is important because of early recognition and treatment. In this study, the prevalence of overweight, obesity and related factors were studied in 7 to 11years old girls in Robat-Karim, Iran 2014.

Materials and Methods

This cross-sectional study was conducted on 490 female students of elementary school aged 7 to 11 years in Robat-Karim (a region in Tehran Province - Iran) in 2014-2015. Subjects were selected through two stages by cluster sample techniques. In the first stage, five schools have been selected out of 21 elementary schools. Then, according to the each school population and total population of elementary school students, a sub-sample was selected from each class. Measuring the weight of students was done using Seca digital scale (allowing for an error of 100 gr) while they had light clothes and bare foot. The height of each student was measured in a standard manner (allowing for an error of 0.5 centimeter). Then, each student's body mass index (BMI) was measured. The percentages of Centers for Diseases Control and Prevention growth charts (CDC) were utilized to determine overweight and obesity (17). Thus, 85-95th percentiles were considered as overweight with respect to age and gender; and ≥95th percentile as obese. The questionnaire was applied to collect the survey data included questions such as birth weight (Gram), duration of watching TV, duration of playing computer games and other electronic entertainments, duration of breast-feeding (Month), BMI of parents, parental education and occupation. Informed consent form for participation in study was filling out by student's parents. Finally, SPSS software was used for statistical analysis.

Results

This study was conducted on 490 female students of elementary school in Robat-Karim, Iran 2014. The mean (±standard deviation) age of the students was 8.97 (± 1.38) years. About 95 (19.4%) cases were7 years, 100 (20.4%) were 8 years, 105 (21.4%) cases 9 years, 104 (21.2%) cases 10 years, and 86 (17/6%) cases was 11 years. According to the Centers for Disease Control and Prevention (CDC), 28 (5.7%) of the students were obese. The most frequent were among children aged 8 years (39.3%) and least frequent in the age group of 7 and 9 years (7.1%). About 75 (5.78%) of the students were overweight. The most frequent were in the age group of 9 years (37.3%) and least frequent in the age group of 8 years (4%). The comparison of overweight and obesity prevalence in the female students of elementary school by age is shown in Table1.The mean (SD) of BMI in obese and overweight students were 24 ± 2.4. Also the mean of time spent for watching TV, computer games and other electronic entertainments in obese and overweight students was 4.2 ± 1.6 hours (Table.2).

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Table 3 shows the comparison of demographic characteristics between two groups of students. Statistical analysis showed that overweight and obesity were significantly related to birth weight, BMI of parents, time spent for watching TV, computer games and other electronic entertainments (P<0.05) (Table.3).

Discussion

The findings indicate that prevalence of obesity and overweight in female students of elementary school in Robat-Karim was 5.7 % and 15.3 %, respectively. Findings of studies in Iran and other countries express different levels of obesity and overweight among female students of elementary school. In most studies, the prevalence of obesity among female students of elementary students was higher than our study. According to a study conducted in Birjand on 6 to 11 year-old girls, the prevalence of obesity was 7.9 % (18). The prevalence of obesity was 13.7 % in the female students of elementary school aged 7 to 11 year-old in Babol (North of Iran) (19). In Golestan (North of Iran), the obesity among female students of elementary school aged 6 to 11 year-old was 12.65 percent (20). Aminzadeh et al. showed that the prevalence of obesity in 6 to 10 year-old girls, in Ahwaz (South of Iran) was 21.08 % (21).

The study of Asadi in Bandar Abbas (South of Iran) showed that the 6.2 percent of 7 to 11 year-old female students in elementary school were obese (22). In 7 to 12 year-old Costa Rican female students of elementary school, the prevalence of obesity was 22.5 % (23). For the 5 to 12 year-old girls in Pakistan, the prevalence of obesity was 6.1 % (24). In Argentina, the prevalence of overweight and obesity among 7 to 11 year-old girls was 17.4 % (25). In some studies, the prevalence of obesity was lower than our study. In a study conducted by Taheri, the prevalence of obesity for female students of elementary school was 1.2 % (26). The conducted study in Marand showed that the prevalence of obesity in female students of elementary school was 3.3% (27). There were significant relations between overweight and obesity with some of the factors mentioned in this study such as birth weight, BMI of parents, time spent for watching TV, computer games and other electronic entertainments. In this study, BMI of parents was related to the overweight and obesity of children so that overweight and obesity was high in students who had parents with high BMI. In other conducted studies, a significant relationship was observed between obese parents and the obesity of children (28-30). In some studies, high maternal BMI was positively associated with the children obesity (31-32). The results of this study showed that children with high birth weight were more likely to be overweight or obese in their school age. Neutzling et al. showed that high birth weight is associated with overweight and obesity in children (28). Comparing birth weight between the two groups of obese and normal children, Michels et al. showed that the birth weight of obese group was higher than normal group, but this relationship was not significant (30). Siqueira et al. observed that obesity was increased in 6 to 11-year-old children by increasing birth weight (32). Furthermore, the mean time spent for watching TV, computer games and other electronic entertainments had a significant relationship

Table1. Prevalence of overweight, obesity and normal weight in students

Variables	CDC reference					
	Obese		Overweight		Normal	
Age (Years)	frequency	Percent	frequency	percent	frequency	percent
7	2	7.1	5	6.7	88	22.7
8	11	39.3	3	4	86	22.2
9	2	7.1	28	37.3	75	19.4
10	8	28.6	15	20	81	20.9
11	5	17.9	24	32	57	14.8
Total	28	5.7	75	15.3	387	79

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with overweight and obesity of students in the study group.

Neutzling et al. demonstrated that the average time spent for watching TV, computer games and other electronic entertainments was one of the most important risk factors for obesity in childhood (28). According to the study of Kalantari et al., the significant relationship between watching TV and obesity was not observed (29).

In this study, there was not a statistically significant relationship between overweight and obesity and duration of breastfeeding in infancy. In most conducted studies, the breastfeeding was considered as a protective factor against overweight and obesity so that the higher duration of breastfeeding led to lower obesity rates in the following years (33-34).

Conclusions

It is recommended that educational

Table 2. Mean and standard deviation of variables in 7 to 11-year-old female students

Variables	Overweight and obese		Normal		*P*-value
	Mean	SD	Mean	SD	
Student Height (cm)	136.6	9.5	135.1	10.2	0.180
Student weight (kg)	45.4	3.2	28.7	5.1	0.001
BMI of Student	24	2.4	15.6	1.7	0.001
Birth weight	3354	508.9	2969	273.8	0.001
Duration of breastfeeding (Month)	18.5	5.8	19	3.7	0.102
Time spent for watching TV, computer games and other electronic entertainments	4.2	1.6	2.9	0.9	0.001
Father's age (years)	42.1	8.6	40	5.9	0.016
Mother's age (years)	37.6	8.8	34.6	4.9	0.011
BMI of Mother	28.1	4.6	23	1.7	0.001
BMI of Father	25.4	3.2	24.2	1.1	0.001

Table3. Frequency of demographic characteristics of study population

Variables	Categories	Overweight and obese		Normal		*P*-value
		frequency	percent	frequency	percent	
Birth weight	Less than 2500 g	8	7.8	28	7.2	0.001
	2500-3900 g	81	78.6	358	92.5	
	More than 3900 g	14	13.6	1	0.3	
Time spent for watching TV, computer games and other electronic entertainments	Less than 3 hours	36	34.9	359	92.8	0.001
	3-4 hours	19	18.5	16	4.1	
	More than 4 hours	48	46.6	12	3.1	
Mother*BMI	Less than 25	30	30.9	225	59.1	0.001
	25-30	57	58.8	152	39.9	
	More than 30	10	10.3	4	1	
Father*BMI	Less than 25	41	40.6	209	54.6	0.001
	25-30	44	43.6	170	44.4	
	More than 30	16	15.8	4	1	
Mother* Occupation	Housekeeper	82	84.5	300	78.7	0.149
	Employed	15	15.5	81	21.3	
Mother* Education	Illiterate	16	16.5	57	14.9	0.131
	Under diploma	71	73.2	290	76.1	
	Diploma and above	10	10.3	34	9	
Duration of breastfeeding (Month)	0	1	0.9	2	0.5	0.102
	Under 6	4	3.9	7	1.8	
	6-12	15	14.6	18	4.7	
	12-24	80	77.7	359	92.8	
	More than 24	3	2.9	1	0.2	

* Some parents were dead or separated.

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interventions should be applied to increase parental awareness about the causes of obesity and its complications. Moreover, some interventions are suggested to be done for children to increase physical activity and reduce the time spent on watching TV, computer games and other electronic entertainments.

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References

1. Egger G, Dixon J. Beyond obesity and lifestyle: a review of 21st century chronic disease determinants. BioMed Research International 2014;2014:1-12.
2. Kelishadi R, Haghdoost AA, Sadeghirad B, Khajehkazemi R. Trend in the prevalence of obesity and overweight among Iranian children and adolescents: a systematic review and meta-analysis. Nutrition 2014;30(4):393-400.
3. Gallus S, Odone A, Lugo A, Bosetti C, Colombo P, Zuccaro P, et al. Overweight and obesity prevalence and determinants in Italy: an update to 2010. European journal of nutrition 2013;52(2):677-85.
4. Ochiai H, Shirasawa T, Nishimura R, Morimoto A, Shimada N, Ohtsu T, et al. Relationship of body mass index to percent body fat and waist circumference among schoolchildren in Japan-the influence of gender and obesity: a population-based cross-sectional study. BMC Public Health 2010;10(1):493-8.
5. Graversen L, Sørensen TI, Petersen L, Sovio U, Kaakinen M, Sandbaek A, et al. Preschool weight and body mass index in relation to central obesity and metabolic syndrome in adulthood. PloS one 2014;9(3):89986.
6. Martínez-Ros M, Tormo M, Navarro C, Chirlaque M, Pérez-Flores D. Extremely high prevalence of overweight and obesity in Murcia, a Mediterranean region in south-east Spain. International Journal of Obesity & Related Metabolic Disorders 2001;25(9):1372-80.
7. Jagadesan S, Harish R, Miranda P, Unnikrishnan R, Anjana RM, Mohan V. Prevalence of overweight and obesity among school children and adolescents in Chennai. Indian pediatrics 2014;51(7):544-9.
8. Roberts KC, Shields M, de Groh M, Aziz A, Gilbert JA. Overweight and obesity in children and adolescents: results from the 2009 to 2011 Canadian Health Measures Survey. Health rep 2012 1;23(3):37-41.
9. Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of obesity and trends in body mass index among US children and adolescents, 1999-2010. JAMA 2012; 307(5):483-90.
10. Taheri F, Kazemi T, Sadeghi H. Prevalence of overweight and obesity among primary school children in Iran from 2001-2013: a systematic review. Modern Care Journal. 2015;12(3):139-45.
11. Amanollahi A, Sohrabi M, Montazeri A, Abadi A, Kolahi A. Prevalence of obesity and overweight in girls of primary school. Payesh. 2011;11(1):89-95.
12. Nabavi M, Karimi B, Raheb G, Mazloom Jafarabadi M, Talebi M. Prevalence of obesity and associated factors in 7-12 years old students. Payesh 2010;9(4):443-51.
13. Solki S, Salehi L, Jamshidi E. Obesity and some related factors among students of elementary schools in Shahryar City. Iranian Journal of Endocrinology and Metabolism 2013;14(5): 464-71.
14. Leech RM, McNaughton SA, Timperio A. The clustering of diet, physical activity and sedentary behavior in children and adolescents: a review. International Journal of Behavioral Nutrition and Physical Activity 2014;11(4):1-9.
15. Casey R, Oppert JM, Weber C, Charreire H, Salze P, Badariotti D, et al.Determinants of childhood obesity: what can we learn from built environment studies?. Food Quality and Preference 2014; 31:164-72.
16. Carlson JA, Crespo NC, Sallis JF, Patterson RE, Elder JP. Dietary-related and physical activity-related predictors of obesity in children: a 2-year prospective study. Child Obes 2012;8:110-5.
17. 2000 CDC growth charts: United States. US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics. Available at: http://www.cdc.gov/growthcharts/cdc_charts.htm
18. Taheri F, Kazemi T, Chahkandi T, Namakin K, Zardast M, Bijari B. Prevalence of overweight, obesity and central obesity among elementary school children in Birjand, East of Iran, 2012. Journal of research in health sciences 2013; 6;13(2):157-61.
19. Ghadimi R, Asgharzadeh E, Sajjadi P. Obesity among elementary schoolchildren: A growing concern in the North of Iran, 2012. International Journal of Preventive Medicine 2015;6:99.
20. Veghari GR, Rahmati R. The Prevalence Of Obesity In Primary Schools Of Golestan Province Of Iran. payavard 2012;5(4):24-31
21. Aminzadeh M, Hoseinzadeh M, Nikfar R, Ghaderiyan M, Mohsenpurian S. Prevalence of

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overweight and obesity among school children in Ahvaz in 2010. J Med Jondishapour 2013;12(4):355-61.
22. Asadi Noghabi F. Prevalence of obesity and overweight among children in Bandar Abbas. Bimonthly Journal of Hormozgan University of Medical Sciences 2011;15(3):218-26.
23. Núñez-Rivas HP, Monge-Rojas R, León H, Roselló M. Prevalence of overweight and obesity among Costa Rican elementary school children. Revista Panamericana de Salud Pública 2003;13(1):24-32.
24. Mushtaq MU, Gull S, Abdullah HM, Shahid U, Shad MA, Akram J. Prevalence and socioeconomic correlates of overweight and obesity among Pakistani primary school children. BMC Public Health 2011;11(1):724-833.
25. Hirschler V, Calcagno ML, Clemente AM, Aranda C, Gonzalez C. Association between school children's overweight and maternal obesity and perception of their children's weight status. J Pediatr Endocrinol Metab 2008;21(7):641-49.
26. Taheri F, Kazemi T. Prevalence of Overweight and Obesity in 7 to 18 Year-0ld Children in Birjand/Iran. Iranian Journal of Pediatrics. 2009;19(2):135-40.
27. Sodaei ZH, Maghbooli L, Payghambardoost R, Aslrahimi V. Overweight and obesity among students: A study from Marand, Iran. Payesh 2013;12(4):415-22.
28. Neutzling MB, Taddei JA, Gigante DP. Risk factors of obesity among Brazilian adolescents: a case–control study. Public Health Nutrition 2003;6(08):743-9.
29. Kalantari NA, Shenavar R, Rashidkhani B, Houshiar Rad A, Nasihatkon AS, Abdollahzadeh M. Association of overweight and obesity in first-year primary school children in Shiraz with breastfeeding pattern, birth weight, and family socio-economic status in school year 2008-09. Iranian Journal of Nutrition Sciences & Food Technology 2010;15;5(3):19-28.
30. Michels KB, Willett WC, Graubard BI, Vaidya RL, Cantwell MM, Sansbury LB, et al. A longitudinal study of infant feeding and obesity throughout life course. International journal of obesity 2007;1;31(7):1078-85.
31. Huus K, Ludvigsson JF, Enskär K, Ludvigsson J. Risk factors in childhood obesity—Findings from the All Babies In Southeast Sweden (ABIS) cohort. Acta Paediatrica 2007;96(9):1315-20.
32. Siqueira RS, Monteiro CA. Breastfeeding and obesity in school-age children from families of high socioeconomic status. Revista de Saúde Pública 2007;41(1):5-12.
33. Arenz S, Rückerl R, Koletzko B, von Kries R. Breast-feeding and childhood obesity-a systematic review. International Journal of Obesity 2004;28(10):1247-56.
34. Soheilifar J, Emdadi M. Relation Between Breast Feeding with Overweight and Obesity in Hamadan Primary School Children. Scientific Journal of Hamadan University of Medical Sciences. 2005;12(2):54-7.

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