

Underweight, overweight and obesity among a Piedmont (Northern Italy) children sample

M. Micheletti Cremasco, A. Lorè*, F. Zanon, E. Fubini

Dip. Biologia Animale e dell'Uomo, Università degli Studi di Torino, Italia

* a.lore@unito.it

KEY WORDS: BMI, underweight, overweight, obesity

Abstract

The aim of the present study is to assess the incidence of under/overweight and obesity in a sample of children 6-11 years old in Turin province and to monitor the secular trend in weight. Our survey shows that about 2% of children are underweight, 17% overweight and 3% obese. Males show a prevalence of overweight and obesity, while females show also underweight problems. The comparison of current data with those collected in 1979 by Ente Italiano Moda (E.I.M.) [1] shows a significant increase of weight problems in both sexes: this, in childhood, is an emergent social problem that can produce adverse health effects in adulthood. It could be prevented encouraging correct eating behaviors and active lifestyle among children.

Introduction

In developed countries a major cause of the weight problems increase is the lifestyle change in relation to environmental and cultural factors. Both overweight and underweight can lead to serious health problems with anthropological, medical and social consequences. Anthropometric studies can give a contribution to identify weight problems: height, weight and their ratio provide a simple method to screen the tendencies in a sample population. According to literature data, the Body Mass Index (BMI) is a good indicator to assess underweight, overweight and obesity, if applied to populations studies. Our purpose is to assess the incidence of under/overweight and obesity in Piedmont children and to point out their secular trend comparing our results with those derived by data collected 40 years ago in the same Italian geographic area by Ente Italiano della Moda (E.I.M.) [1].

Materials and methods

Our survey involved 1619 children, 6-11 years old, attending various primary schools in Turin province, from 2001 to 2009. We measured anthropometric variables according to ISO 7250-1/2008 [2]. We calculated the BMI and we used it to identify the cases of underweight, according to criteria proposed by Cole et al. [3], and the cases of overweight and obesity according to threshold values of Cacciari et al. [4]. Both the percentages of overweight and obesity, and the 3rd, 50th and 97th percentiles were compared with those derived from the above mentioned research by E.I.M. [1].

Results

The following results regards only 1596 subjects (782 males and 814 females) as we decided to leave out the first age class (5.50-6.49) that was represented by less than 30 people. About 2% of children (tab.1) is underweight, 17% overweight and 3% obese.

age class	MALES					FEMALES				
	N	%				N	%			
		under weight	normal weight	over weight	obesity		under weight	normal weight	over weight	obesity
6.50-7.49	82	0.0	68.3	24.4	7.3	116	2.6	81.9	12.1	3.4
7.50-8.49	114	0.0	71.1	24.6	4.4	95	2.1	82.1	14.7	1.1
8.50-9.49	211	2.4	71.1	22.7	3.8	195	2.1	83.6	12.3	2.1
9.50-10.49	227	2.6	74.9	20.3	2.2	254	2.0	83.9	12.6	1.6
10.50-11.49	148	0.0	77.7	20.3	2.0	154	1.3	87.0	10.4	1.3
TOT	782	1.4	73.1	22.0	3.5	814	83.9	2.0	12.3	1.8

Table 1. Under/overweight/obesity percentage by gender and age classes.

Males show a prevalence of both overweight and obesity, compared with females. On the contrary, females show prevalence of underweight compared to males. Comparing the 3rd, 50th and 97th percentile of BMI of the current study with those of Cacciari, we note that the 97th percentile BMI values of males of our sample are higher, particularly in the first three age classes (Fig.1). The comparison of overweight and obesity percentages of current work with those of E.I.M. shows a significant increase of weight problems in

both sexes. In the Seventies overweight subjects were 2-9% in males and 0-4% in females; now they are more than 20% in males and more than 10% in females in all age group. The obesity increase is between 0% and 2% for both sexes.

Discussion

Our analysis demonstrates that the incidence of overweight and obesity in students of primary school in Turin province is more than twofold than forty years ago. It also highlights that the underweight phenomenon tends to regard ever younger subjects. The increase of weight problems in children is an emerging social and public issue that can produce adverse health effects in adulthood. The principal cause of this increase is the lifestyle change: on one hand there is a decline in physical activity with a consequent growth of sedentary leisure activities [5-6]; on the other hand various social influences tend to determine wrong eating behaviors. It is therefore important to promote initiatives addressed to children, families, educators and teachers to encourage proper eating habits and an active lifestyle.

References

- [1] Ente Italiano della Moda 1979. Le misure antropometriche della popolazione italiana. L'abbigliamento delle classi giovani dai 6 ai 19 anni. Ed. Franco Angeli, Milano, Italy.
- [2] ISO 7250-1 2008. Basic human body measurements for technological design-Part 1.
- [3] Cole T.J., Flegal K.M., Nicholls D., Jackson A.A. 2007. Body mass index cut offs to define thinness in children and adolescents: international survey. *BMJ*, 335: 194.
- [4] Cacciari E., Milani S., A. Balsamo, Spada E., Bona G., Cavallo L., Cerutti F., Gargantini L., Greggio N., Tonini G., Cicognani A. 2006. Italian cross-sectional growth charts for height, weight and BMI (2 to 20 yr). *J. Endocrinol. Invest.*, 29: 581-593.
- [5] Fubini E., Micheletti Cremasco M., Toscano E. 2007. Computer, television and playstation use in developmental age: friends or enemies of growth and health? Study on a Northern Italy sample 6-14 year old. In: *Ergonomics and Health Aspects* (Dainoff M.J., Ed.), LNCS 4566, Springer-Verlag, Berlin Heidelberg, Germany, 207-215.
- [6] Fubini E., Micheletti Cremasco M., Toscano E., Busceti F., Laporta S., Ladisa G. 2007. Health hazard of the increased widespread use of new technologies by children and young people of Northern Italy. *Scand. J. Work Env. Hea.*, Suppl.3: 42-48.

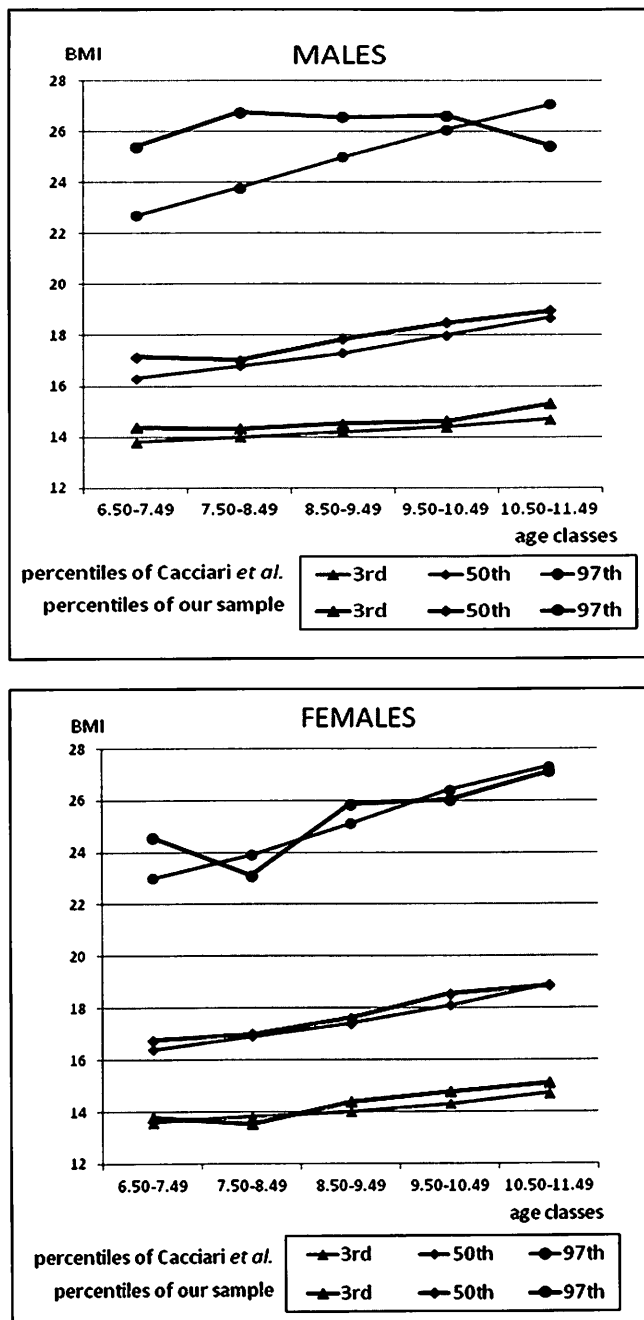


Figure 1. BMI 3rd, 50th and 97th percentiles of our sample vs. Cacciari et al. (2006)