

## CHILDHOOD OBESITY: GLOBAL ISSUES

Maria Rosaria Juli

“Consultorio familiare Il Faro”, Foggia, Italy

### SUMMARY

*The eating disorders are a group of situations which are very complex that include abnormal feeding patterns, too much worry about the physical aspect, no real perception of the body image and a strong link between all these factors and the levels of self-esteem (Fairburn & Harrison 2003, Sigel 2008, American Academy of Pediatrics 2010, Dalle Grave 2011). From the '50s of the previous century we had a continuous increase of the Eating Disorders (Dalle Grave 2011). Indeed, in the National Program of the Prevention is stated that: “The spread of the eating disorders is very fast and relevant; there is no other disease with the same propagation and that looks like a real social epidemic” (The Ministry of Health 2010). At the same time, there was a reduction of the time of onset (Favaro et al. 2009) with cases of girls 8/9 years old, before having their first period (Dalla Ragione 2012). This means that the pediatricians should pay more attention to the eating disorders because there is a big delay in the diagnosis that can have a negative impact on the therapy to apply and on the prognosis (American Academy of Pediatrics 2010). Overweight and eating disorders are the main problems of public health among adolescents and many works show a direct link between eating disorders and child obesity (Babio et al. 2009). In the case of children, the diagnosis is very complex, especially during the early adolescence (-12 years) due to the large heterogeneity of the somatic expressions that make difficult a precise nosographic study. Therefore, it is necessary that the pediatrician has a good knowledge about the eating disorders in order to identify them quickly and to start a multidisciplinary path and to promote an improvement in the long term.*

**Key words:** eating disorder - childhood obesity - changing the life-style

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### INTRODUCTION

The Eating Disorders are multifactorial diseases determined by a complex interaction of biological, psychological and physical factors. Some individual, family and genetic characteristics are the main factors that cause the onset of these disorders. The eating disorders are defined as persistent disorders of the food behavior and/or the attitude to take under control the weight that damages the physical health and the psychosocial system; they are not subordinate to any medical and psychiatric known situation. At an early age, the eating disorders are a very common and variable situation. Indeed, in addition to temporary events, there are some critical phases (weaning, independent nutrition, etc.) characterized by serious conditions such as the total refusal of the food with strong impact on the physical and psychological development of the child. The current diagnostic classifications of the eating disorders (DSM V, E ICD-11) include the disorders in one category, “Eating disorders of the childhood”. Despite the level of malnutrition in the planet, the World Health Organization states that the obesity is one of the main problems of public health in the world. This significant increase is a condition characterized by an excessive accumulation of body fat, normally caused by a bad nutrition and sedentary lifestyle. Nutrition and physical activity are strongly influenced by the social, economic and cultural conditions. Obesity is not a “problem of rich people”. Indeed, the disadvantaged sections of the population at a socioeconomic level generally consume more meat, greasy food and carbo-

hydrates rather than fruits and vegetables and do not take care about their physical image and physical health. Obesity is defined as an excessive accumulation of fat body compared to lean body mass in terms of absolute quantity and distribution in some specific parts of the body. The measurement of the body fat distribution can be done using several methods, from the measurement of the skin folds to the relationship between the waist circumference and the circumference of the hips or using more sophisticated methods such as ultrasound, C.T. or M.R.I. The classification of the population based on the weight can be done using the Body Mass Index (BMI), taking into account the presence of the excess of the body fat. The formula to calculate the BMI is: weight in kilograms divided by the square of height in meters. There are obviously some differences depending on the gender: for equal BMI, women have more fat body compared to men and old people have more fat body compared to young people. Besides, people that practice a lot of physical activity can weigh more due to their more developed muscle mass but anyway they are not included in the category of overweight or obesity for this reason. For people that do not exceed 19 years the classification is done using the growth curves from the World Health Organization and the threshold values from the International Obesity Task Force (IOTF) that take into consideration age and gender.

### THE PARADOX OF THE DIET

Many studies state that the diet, as a solution against the obesity, is not really effective to prevent the weight

increase and that it can be paradoxically linked to the risk of a bad nutrition and consequent overweight, in children and adolescents. Although there is a great variability in the behavior of the people about the “diet”, anyway the majority of people with Eating Disorders say that they started food restriction before having dysfunctional behavior. Therefore, the food restriction seems more involved as a risk factor for the envelopment of Binge Eating especially when it is associated with depressive symptoms in persons of the female sex. The failure of the dietetic restrictive approach shifted the focus from the simple calculation of the calories to the lifestyle and mental-emotional aspects. If the food is considered as “premium” and gratification, removing or reducing it drastically can produce a compulsive reaction in favor of other pleasures such as alcohol and drugs. Many studies state that the pleasure represents a strong link among living beings. The emotional imprinting between food and pleasure happens the first time with the mother’s milk in which there is the beta-casein protein that, due to an enzyme degradation, produces a substance similar to opium, the beta casomorphin that reaches the brain of the child, determining the feeling of pleasure together with the satisfaction of a need strengthening, in this way, the request of food and motivation to suck (Nyberg 1992). People that have no good relationship with the food very often follow a restrictive diet, loose weight, start eating again as before and become fatter than before. Recent researches show that the number of overweight people is increasing, even if they are more expert about nutrition, read many books and follow paths that support them during the diet. But why? Because getting fat and losing weight cyclically is not a physical matter but it depends on the mind, on our thoughts and emotions. For instance, eating for a strong emotion (emotional eating) is an aspect which is very common in these people that tend to eat in case they are bored, angry, sad, etc. The World Health Organization stated that the problem of overweight and obesity is, in the majority of the cases, a psychological problem.

## PATHOGENESIS

The pathogenesis of obesity is multifactorial, linked to the circular interaction, during life, of genetic and environmental (family, work, social) factors, bad eating habits, low energy expenditure, metabolic abnormalities, cardiovascular diseases, mood disorders, personality disorders, etc. The obesity of a child is not a simple condition, indeed it can change from a modest overweight for a limited period when the child ate too much or was inactive to a serious obesity with deformation of the body and difficulties in all situations. Over the years the assessment of childhood obesity had many changes: in the ‘30s the endocrine theories were considered very important, therefore it was common to speak about endocrine disorders (e.g. Froehlich syndrome) and to bring children with these eating disorders to the

endocrinologist. A common characteristic to all children with obesity is the interaction between their excessive nutrition and complex processes of growth, in the period before adolescence; indeed, the onset of the secondary sexual characteristics shows the progress of the biological maturation. In the ‘60s/’70s the idea of obesity was focused on the overeating of the child as cause of the obesity. The researches from Brunch state that simple “factors” as inactivity and overeating have an impact of 70/80%. It is very typical to find in these people the weight cycling syndrome, known as yoyo: an alteration of weight already present in the children. This syndrome has very ancient origins and was used as punishment for the wit of the man that had challenged the Gods. The obesity in children and adolescents causes many respiratory and joint problems, limited mobility, but also problems of the digestive system and psychological problems. In addition to this, those that are obese during childhood very often are obese also in adulthood: this means that they have more risk to envelope premature cardiovascular problems (hypertension, coronary diseases, possibility of heart attack) and conditions of altered metabolism (type 2 diabetes or hypercholesterolemia). Moreover, in the children, it is important to guarantee a provision of calories for their growth, otherwise they could have different consequences that can be classified as follows:

- Cardiovascular 50%/55% from 5 to 10 years at least one of these factors, 25%>2: arterial hypertension, hypertriglyceridemia (<130 mg/dl), hyperinsulinaemia without food (>7 U/L before puberty and >11 U/L in the puberty), high LDL cholesterol (>130 mg/dl), low HDL (<35 mg/dl);
- Metabolic complications: cases of type 2 diabetes due to excess adiposity have been found in children of 8 years; in Europe there are 20.000 obese adolescents with type 2 diabetes and 400.000 with reduced glucose tolerance;
- Osteoarticular complications: postural disorders, orthopedic defects in the legs, slowdown of height velocity, alteration of the body composition, flat feet;
- Gastroenterological complications (fat liver, hepatic steatosis);
- Respiratory complications: bronchial asthma, sleep apnea.

There are also other psychosocial consequences: depression, withdrawal from social life, low self-esteem, body dissatisfaction, obsessive-compulsive behavior, school problems, shame, failure. Obesity is not a good condition for children and adolescents, because for them even simple overweight can represent an enormous barrier in a society obsessed by thinness (Brunch 1975). In the case of Eating Disorders, there are very often also other psychiatric disorders. During childhood, anxiety disorders and mood disorders represent the most common comorbidities that suggest the presence of an etiopathogenetic link among the different nosographic

entities (Brooks et al. 2012). In the anamnestic reenactments is often stated that there is onset of affective disorders and anxiety disorders before the onset of the symptoms linked to the Eating Disorders (American Academy of Pediatrics 2010, Dalle Grave 2011, Dalla Ragione 2012). In the past some studies showed the presence of pre-pathological conditions and temperamental tendencies that, if increased by family conditions, can support atypical personalities during childhood (perfectionism, obsessiveness, rigidity) that can anticipate the comorbidities defined as Personality Disorders (Costa e Montecchi 1996, Caretti et al. 2000). In childhood obesity there are no psychological aspects that contribute to the onset of the disease, but it becomes a complication inevitably. These children have the stigma attached: they are considered fat, funny, lazy but easy prey of the bullying. The world of the obese child is a problematic world. Three out of four parents do not consider that their child is overweight; for them their children have a good appetite and this makes them reassured. The problem for them is when the children do not eat, becoming problematic, causing anxiety and insecurity but when the overweight becomes obesity, then the feeling of family failure comes and the problem has to be solved soon and finally the parents bring their children to the dietician. It has to be highlighted that obese girls have four times more the risk to be victims of aggression compared to obese boys and girls that are not obese (Wiegand 2007). The abuse causes an higher risk of food problems and there is a direct link between the abuse in childhood, obesity and problematic management of the weight in adulthood (Fuemmeler et al. 2009). The warning signals of the onset of Eating Disorders are: worry about food and weight, excessive diet, calculation of the calories, to weigh ourselves many times during the day, feeling of guilt and shame (e.g. not wanting to eat in front off other people), bulimic behavior and/or removal (including an excessive physical activity), to feel fat, too much attention to the appearance, hypersensitivity reaction to comments about the body, irritability, sadness, withdrawal from social life.

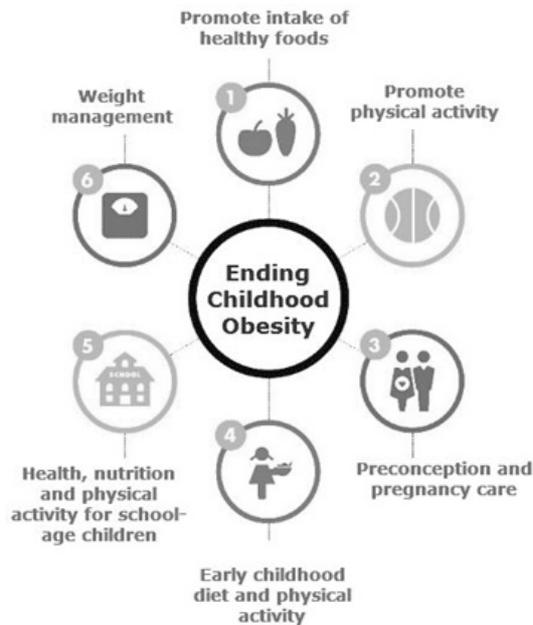
## NATIONAL DATA ON CHILDHOOD OBESITY

Currently, the prevalence of overweight and obesity in children aged 6 years in Italy is comparable to that of later age (about 25%), with no significant differences between the sexes and with considerable variations between regions. Therefore, the space for prevention interventions are confined to the earliest years of life, if not by birth. Globally, the number of obese and overweight children, with less than 5 years of age has increased from 31 million in 1990 to 41 million in 2014, with an increase in prevalence from 4.8% to 6.1%. A growth that has at the forefront mainly children living in low- and middle income countries that always puts sharper

focus the need for dedicated actions. The work of the Commission on Ending Childhood Obesity (Echo) that, on 25 January, published its final report fits into this context. The Echo recommendations are addressed to governments and summarized in six main points, the work done by the Commission in these two years:

- *To promote the intake of healthy foods:* the implementation of comprehensive programs that promote healthy eating among children and adolescents, reducing the intake of unhealthy foods and sugary drinks (through, for example, an effective tax on sugary drinks and curbing the marketing of unhealthy foods);
- *Promoting physical activity:* implement programs that promote physical activity and reduce sedentary behavior among children and adolescents;
- *Assistance during preconception and pregnancy:* development/integration guides for the prevention of non-communicable diseases with the current indications of preconception and prenatal care (in order to reduce the risk of childhood obesity, preventing a birth weight is too low or too high, and prematurity other complications during pregnancy);
- *Early attention to diet and childhood physical activity:* providing advice and support regarding a healthy diet, sleep and physical activity in early childhood and promote healthy habits so that children grow up with healthy habits (promoting breastfeeding; limiting the consumption of high-fat foods, sugar and salt; ensuring the availability of healthy foods and promoting physical activities in places frequented by children);
- *Health, nutrition and physical activity for children of school age:* implement comprehensive programs that promote healthy school environments and literacy of children and adolescents on health, physical activity Nutrition (by establishing standards for school meals eliminating the sale of unhealthy foods and beverages, including and strengthening physical education and health education and nutrition in the curriculum); services/weight management;
- *Management:* develop and support services for the taking in charge of obese children and adolescents, through the implementation of direct actions working in a multidisciplinary way with families (Figure 1).

The 'Action Plan on Childhood Obesity 2014-2020, published in February 2014 by the European Union confirms the need and importance of a national surveillance system on the lifestyles of children of primary school. Italy's commitment in the fight against childhood obesity becomes even more concrete with the recent accession to the European Joint Action on nutrition and physical activity Janpa (Joint Action on Nutrition and Physical Activity), whose main goal is to stop, by in 2020, the increasing prevalence of overweight and obesity among children and adolescents. The social cost of obesity is about 6% of health costs.



**Figure 1.** Oms, Final report of the Commission on Ending Childhood Obesity

## ASSESSMENT AND TREATMENT

- *Clinical evidence has demonstrated that traditional dietotherapy is failing:* it is not capable to promote a life style change by endorsing a controlled weight loss that is necessary to reach and maintain a body weight that is compatible with bio-psycho-social wellbeing.
- *When the body is put on a very special nutritious diet, we witness neurological and hormonal changes:* an increase in hunger, particularly for food rich in carbohydrates that modify neurotransmitters (serotonin and its precursor tryptophan).
- *One feels full later:* diets determine the reduction of leptin levels (a protein produced by fatty tissue) which has the function of inducing a sense of fullness by working on the hypothalamus. The therapeutic-rehabilitation approach must be just as complex (integrated interdisciplinary), both during the evaluation (assessment) and the treatment (management). In particular during the diagnostic phase, it is necessary to conduct an evaluation of nutritional status; energetic balance; observation and recording of dietary habits, basal metabolic rate and level of physical activity (indirect calorimetry, food diary and physical activity questionnaire);
- *Body composition:* amount and distribution of fat mass and lean mass (BIA); biological parameters linked to the rise of fat mass (glycemic control) and possible decrease in lean mass.
- *Cardiovascular and respiratory risks:* clinical exams, electrocardiographs, spirometry, etc.; level of daytime sleepiness, connected to sleep apnea syndrome.
- *Endocrinology profile:* haematochemical parameters; diagnostics imaging. Psychological profile, evaluation of: food disorders; body image disorders; multiple psychopathological indexes; quality of life.

- *Motor function and osteoarticular problems:* resistance; perceived exertion; articular flexibility and mobility. The therapeutic-rehabilitation intervention aims not only to the biological and psychopathological functional recovery, but especially to the recovery of performance, and individual and functional abilities, the improvement of quality of life. The integrated multidisciplinary approach, which emphasizes a change in life style and a control of the weight of the child and his/her parents, when applied to obese children and their families, produces a significant weight loss in 34% of cases, even at a 10-year follow up.

The physician team must include: child neuropsychiatrist, psychiatric pediatrician/internist, psychologist, dietitian, nurses, but it can also be integrated by different external specialists based on the needs of individual patients as well as non-medical personnel, such as educators, dance instructors, etc. (Nice 2004, Singel 2008, American Academy of Pediatrics 2010, Nicholls et al. 2011, Dalla Ragione 2012).

The evaluation of psychopathological characteristics in pre adolescence and adolescence must be obtained through specific means, such as:

- EDE - Eating Disorder Examination, for behavioral trait evaluation (Fairburn & Cooper 2003);
- CBCL - Child Behavior Checklist, for symptomatology and psychiatric comorbidity evaluation (Achenbach 1992);
- K-SADS - Kiddie Schedule for Affective Disorder and Schizophrenia for psychopathological symptomatology evaluation (Kaufman et al. 2004);
- Caps - Child Adolescent Perfectionism Scale, for the evaluation of perfectionism as predictive factor of ED (Flette et al. 2000);
- PBI - Parental Bonding Index for the evaluation of the specific characteristic of interaction between a child and the parent from the minor's perspective (Parker et al. 1979);
- ECI - Experience of Caregiving Inventory for the evaluation of stress factors connected to the child's characteristics (Joyce et al. 2000). These tools allow for an evaluation of behavioral and psychological traits linked to ED such as the impulse to be thin, the dissatisfaction with one's body, the tendency to perfectionism, emotional dysregulation, and interpersonal insecurity.

## THE IMPORTANCE OF THE PEDIATRICIAN

The Free Choice Pediatrician (Pediatria di Prima Scelta – or PLS) can be a crucial figure in obesity prevention because his/her role is fundamental in early acquisition of correct dietary habits and life style. In that, it represents a professional role that possesses the best requirements in this context: generally, he/she knows the family well, and has been following the child from birth until at least six years old, using the Health Balances

(check at set times during the first six years of life). Besides, he/she has the chance to strengthen his/her educational role and to interpret the child's growth pattern, communicating with the family any deviation from the norm. In order to evaluate the seriousness of the disease in daily clinical practice, some authors (De Luca et al. 2013) pair the pediatrician's observations with a scale of three ascending steps indicating the seriousness of the ED as observed by the family pediatrician:

- *Suspicion*: the children who have started dangerous or unhealthy practices to lose weight, by excluding one type of food or vomiting or continually checking their body weight. These conditions underline a difficulty in accepting one's look and one's weight;
- *Diagnosis*: includes cases that fully match the diagnostic criteria of DSM V and ICD-11 without showing signs of grave and immediate danger, either biologically or pathologically;
- *Emergency*: patients manifesting serious conditions, for which it is imperative to administer urgent care by a multi-professional team, up to including admission in a facility.

## CONCLUSIONS

Preventive programs enacted up until now have had a low degree of success because they were primarily or strictly aimed to the medical class and were unable to minimally involve other social components (family, school, media, institutions, businesses). Only coordinated projects within widespread campaign outreach can have a chance to succeed. In the case of obesity, when it is not linked to a specific pathology, the main treatment is prevention: only by embracing a healthy life style through a correct diet and adequate physical activity can one control one's weight and avoid exceeding it up to risk levels. Obesity prevention campaigns are often based on caloric restriction, on the need to increase one's physical activity, while the ones based on the prevention of Food Disorders (Eating Disorders) often accentuate the fact that weight is genetically predetermined and it is necessary to accept one's size and body image (Neumark-Sztainer 2003). It is necessary to think of prevention campaigns that are able to address common risk factors and protectors (Neumark-Sztainer 2005, 2007, 2009). A study conducted by Neumark-Sztainer in 2009 has pointed to five essential factors to be able to integrate a prevention program for ED and obesity: discouraging the use of non-correct diets, by promoting a physiologically correct life style; promoting a positive body image; encouraging pleasantness during meals; motivating families to speak less about weight, while inspiring a healthier life style; keeping in consideration that often overweight adolescents have

been put through incorrect treatments, and approaching both families and friends with this subject.

To face and manage best the global crisis that is childhood obesity, the WHO has constituted a Commission on Ending Childhood Obesity whose aim is to identify contrastive approaches and interventions that have proven themselves most efficient in various countries of the world. Let us not underestimate that an early diagnosis and an adequate treatment are able to bring to a full remission within 5 years and secure a good quality of life for the majority of patients (Kell & Brown 2010).

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Correspondence:

Maria Rosaria Juli, MA  
Consultant at "Consultorio familiare Il Faro"  
via C. Baffi, 1, Foggia, Italy  
E-mail: mariarosaria.juli@libero.it