

## ORIGINAL ARTICLE

# Is children's Body Mass Index associated with their parents' personality? A prospective controlled trial

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## ABSTRACT

**BACKGROUND:** The aim of this study was to elucidate the effect of the personal characteristics and psychological status of parents on their children's Body Mass Index (BMI) by using validated questionnaires.

**METHODS:** Obese and healthy control group was assessed with The Parental Attitude Research Instrument (PARI) for the evaluation of parental attitudes towards their children. Additionally, Depression Anxiety and Stress Scale (DASS) were used to assess the relationships between parental depression, anxiety, stress and childhood obesity.

**RESULTS:** A total of 105 children and their parents were divided into two groups. The study group consisted of 58 children with a BMI of higher than 85<sup>th</sup> percentile whereas 47 children with normal BMI (<85<sup>th</sup> percentile) were included as the control group. In both groups, the BMI of mothers which is between 25-and 30 kg/m<sup>2</sup> and >30 kg/m<sup>2</sup> had significant impact on the risk of children's obesity status 1.12-fold and 3.68-fold respectively. The PARI results provided that the children who had disciplined, over-protective parents and those in the parental incompatibility group had higher risk of being obese. Analysis of the DASS Test results showed that children having depressed parents had significantly higher risk of obesity than children whose parents were not depressed (P<0.05).

**CONCLUSIONS:** Our results provided that, the parent's status such as obesity, depression and strict personal behaviors have negative impact on their children's weight which is resulting with obesity.

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**Key word:** Obesity - Body Mass Index - Parents - Attitude - Child.

Obesity is defined as the accumulation of excess fat in the body as a result of a higher dietary consumption of energy than that of energy expended.<sup>1</sup> The World Health Organization (WHO) has described obesity as a "global epidemic" which is demonstrating its high frequency and prevalence. Moreover, childhood obesity may initiate weight problems in later years. It has been shown

that more than half of the children aged over 10 years diagnosed with obesity are also diagnosed as obese in adulthood.<sup>2</sup> This condition leads to increased frequency of a number of other diseases including cardiovascular disease, type 2 diabetes mellitus, and asthma within the upcoming years.<sup>3</sup> The most commonly used method in determining obesity is the Body Mass Index (BMI) measurement.

Although there are no exact standards for definition of childhood obesity, percentiles higher than the 85<sup>th</sup> percentile for age and gender are used to indicate obesity.<sup>4,5</sup>

Parents have significant influences on their child's weight. In addition to genetic influence, parenting style may have a role in the development of young children's dietary behavior.<sup>6</sup> Parents play an important role in the development of children's dietary behavior, especially in the early years of life when parents have a high degree of control over their children's eating environment and experience. Current literature suggests that parenting styles emerged from the linear break-up of responsiveness and demandingness.<sup>7</sup> Authoritative parenting style, *i.e.*, one that is characterized by acceptance and responsiveness, including high levels of support, emotional connection, and democratic behavioral control has been related to several child outcomes including decreased risk-taking behavior, improved school achievement, and increased self-regulatory ability.<sup>8</sup>

There is a growing body of research investigating the effect of parenting style on children's dietary behaviors.<sup>9-11</sup> When evaluating the causes of childhood eating disorders, it is clearly seen that besides physical factors, psychological factors are also utmost important.<sup>12, 13</sup> Findings are mixed, however, as to the relationship between maternal depression and childweight.<sup>14</sup> In addition, maternal depression was predictor a greater likelihood of overweight children, and depression was associated with more authoritarian and distant feeding styles and reduced use of positive family meal practices.<sup>15</sup>

Parents' psychological state and parenting style can affect the lifestyles of their children and may seriously influence the quality of their diet, resulting in weight gain.<sup>16</sup> In addition to children of strict parents, eating disorders are also commonly seen in children of relaxed, or even neglectful, parents.<sup>17-19</sup> Most studies have been focused on school-aged children and adolescents, with few studies of this kind conducted specifically among young children.<sup>6</sup> Thus, one of the strategies for prevention of obesity in childhood is the psychological assessment,

and treatment and support for parents. However there is not enough well conducted studies to prove the effectivity of this strategy. Therefore, our main goal is to demonstrate that, whether the personal characteristics of parents may lead to excess and irregular eating which may then cause obesity in their children.

## Materials and methods

The Ethic committee of Istanbul Medipol University approved the study protocol (approved number and date was 10840098-13/17.01.2014). The children's parents signed an informed consent for participation after having read an explanatory note. Subjects were given case numbers, and identities were kept confidential.

After obtaining institutional review board approval, this study was carried out between January and April 2014. A total of 105 children and their parents were enrolled according to the eligibility criteria. Children whose body-mass index over 85<sup>th</sup> percentile between 8-14 year old were accepted as obese (N.=58) and enrolled into the study group 47 children with normal BMI (<85<sup>th</sup> percentile) were included as the control group in Turkish sample. Obese children who have metabolic condition such as chronic diseases including endocrinological disorders, type-1 diabetes mellitus, hypertension, psychiatric disorders or other acute and chronic disease were excluded. Additionally, children with neurological and musculoskeletal system disorders were excluded since these disorders may cause obesity due to immobility.

### *Anthropometric measurements*

History and physical examination were performed including anthropometric measurements (weight, height, blood pressure). Standardized protocols were used by the trained examiners. The weight of children wearing minimal clothing was measured to the nearest 0.1 kg with a portable electronic scale. Each time it was moved, the scale was recalibrated and standardized. Height was measured with a fiberglass tape. BMI was calculated as weight

(in kilograms)/height (in meters). Body circumferences were measured with subjects in the standing position. Using the tables provided by the waist circumference percentiles in a nationally representative sample, we determined subjects with increased waist circumference ( $> 90^{\text{th}}$  percentile).<sup>20</sup> Body proportions normally change during pubertal development and may vary among persons of different race and ethnic groups. Age- and sex-specific cutoff points of BMI were used to assess the overweight and obesity status. These cutoff points of BMI were developed and published from the centile curves of an international reference population.<sup>21</sup> All mothers were also assessed in regarding to these aspect.

### Blood pressure

Blood pressure was measured by manual sphygmomanometer. Small and medium cuffs were used for arm circumferences of less than 22 and 22 to 32 cm, respectively. To find the age-specific height percentile level for each case, we used the growth curves drawn for healthy Turkish children.<sup>22</sup> Using the tables provided by the Task Force Report on High Blood Pressure in Children and Adolescents, we determined children and adolescents with elevated blood pressure ( $\geq 95^{\text{th}}$  percentile).<sup>23</sup> All mothers were also assessed in regarding to these aspect.

The study group consisted of 58 children with a BMI of higher than 85<sup>th</sup> percentile whereas 47 healthy children with normal BMI (below than 85<sup>th</sup> percentile) were included as the control. All children undergone systemic physical examination, length, weight, and arterial blood pressure. A blood sample was obtained and fasting glucose levels, HbA1c, lipid profiles, and liver enzyme levels were detected. Fundus examination was carried out by an ophthalmologist for the detection of possible pseudotumor cerebri. Patients who were diagnosed with *Acanthosis nigricans* were referred for evaluation for insulin resistance and these children were excluded. *Acanthosis nigricans* was thought closely related with insulin resistance and diabetes mellitus. As excessive and

persistant eating habit may lead to insulin resistance, these habits may interfere our aim and findings because our study was to investigate relationship between personal characteristics of parents and obesity regarding to psychological impact in children. Thus, *Acanthosis nigricans* was excluded. In addition, patients' blood pressure was measured and all were in normal ranges. Sociodemographic questionnaires included age, marital status, mother's education level, employment status, monthly income, number of children, eating habits, and obesity among any family member. After completion of the physical examination, children were referred to a psychologist for further evaluation.

The Parental Attitude Research Instrument (PARI) Test was used for the evaluation of parental attitudes towards their children. PARI is a self-report assessment, which evaluates parents' nurturing styles on a scale. This test includes 60 questions with a scale of 4 possible answers (1-4), ranging from 1 ("I do not agree at all") to 4 ("I agree completely"). Originally developed by Schaefer and Bell, and later on, it was validated in Turkish language.<sup>24</sup> The test includes 5 sub-categories: democrat, protectiveness, discipline, parental incompatibility, and rejection of the role of a housewife. The 22<sup>th</sup> and 44<sup>th</sup> items are reversed, and high points for any sub-category indicate high level of agreement with the projected attitude of that sub-category.

During the second part of the study, relationships between parental depression, anxiety, stress, and the development of obesity in their children were assessed by a specialist psychologist using the "Depression Anxiety and Stress Scale (DAS)." DAS is a self-report assessment, which evaluates stress, depressive symptoms, and anxiety in an individual. It is based on a scale of 4 possible answers ranging from 0 "never" to 3 "always," and includes 42 questions. This test was developed by Lovibond and colleagues and adapted for the Turkish language by Akin *et al.*<sup>25</sup> For each category of the test, the minimum score is 0, and the maximum score is 42. The rating system related to the strength of each category is

TABLE I.—*Depression Anxiety and Stress Scale.*

	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Very severe	28+	20+	34

shown in Table I. To validate the original scale changes between categories, factor loads were 0.36-0.80 for the depression sub-category 0.31-0.64 for the anxiety sub-category, and 0.40-0.76 for the stress sub-category. Internal consistency for depression, anxiety, and stress were 0.96, 0.89, and 0.93, respectively. Factor loads for the Turkish scale for depression, for the anxiety sub-category and for the stress sub-category scale were 0.39-0.88, 0.59-0.78, and 0.56-0.82, respectively. Internal consistency for depression, anxiety, and stress were 0.90, 0.92, and 0.92 respectively. These values prove the validity and reliability of DASS.

### Statistical analysis

Analysis of results was performed by using the SPSS 18.0 program. The chi-square test was used to evaluate categorized qualitative differences between groups, and the student's t-test was used for comparison of quantitative results, like age and test scores. Logistic regression analysis was used to investigate the qualitative and quantitative factors in parental contribution to child obesity. All the variables were statistically compared between the groups. P values of less than 0.05 were considered significant.

### Results

The study group was consisting of 58 children and 26 (45%) were male and 32 (55%) were female. The average age was 12.1±4.2 years (range, 4-14 years). Demographic characteristics of children and parents from each group are shown in Table II.

The effect of maternal BMI on their child's BMI was analyzed by single regression anal-

TABLE II.—*Demographics of the test group and control group.*

	Study group (N.=58)	Control group (N.=47)	P-value
Gender			
Male	26 (44.8%)	19 (40.2%)	0.66
Female	32 (55.2%)	28 (59.8%)	0.23
Age (year)	12.1±4.2	11.3±2.3	0.46
Maternal BMI			
<20 kg/m <sup>2</sup>	5 (8.6%)	3 (6.38%)	0.38
20-25 kg/m <sup>2</sup>	15(25.8%)	13 (27.65%)	0.23
25-30 kg/m <sup>2</sup>	26 (44.8%)	22 (46.8%)	0.08
>30 kg/m <sup>2</sup>	12 (20.6%)	9 (19.4%)	0.6
Income *			
High (>85 percentile)	15 (25.86%)	9 (19.4%)	0.13
Moderate (15-85 percentile)	27 (46.55%)	21(44.68%)	0.46
Low (<15 percentile)	16 (27.58%)	17 (36.17%)	0.66
Working mother	32 (55.17%)	26 (55.31%)	0.41
Education level			
Higher education	24 (41.37%)	18 (38.29%)	0.06
High school	20 (34.48%)	18 (38.9%)	0.09
Primary school	14 (24.13%)	11 (23.40%)	0.06
Number of children			
1	26 (44.8%)	20 (42.55%)	0.13
2	20 (34.6%)	15 (31.91%)	0.24
>3	12 (20.6%)	11(23.40%)	0.13

\*According to datas of Turkish Statistical Institute Income and Living Conditions Survey 2013.

ysis. It was shown that children of mothers with a BMI of 25-30, and above 30, had a higher probability of being obese than children whose mothers had an average BMI (P<0.01). After correcting with the z-value for child height-weight, children of mothers with a BMI of 25-30 had a 1.12-fold higher risk of obesity, while, children of mothers with a BMI above 30 had a 3.68-fold higher risk. In contrast, we found that children of mothers with a BMI less than 20 had lower obesity risk (P<0.05) (Table III).

In terms of the relationship between familial income and subject obesity, there was no significant difference between children of families with income ≤15<sup>th</sup> percentile and children of median income families, while children from low-income families had a 2.84-fold higher risk of being obese.

Although there was a higher frequency of obesity in children with employed mothers,



TABLE III.—The effect of mother's BMI on children's risk of obesity.

BMI±(Mother)	Cumulative Index	Risk factor	Corrected risk factor
Low (BMI<20)	2.7	0.42 (0.22-0.78)**	0.45 (0.25-0.84)**
Normal (20<BMI<25)	4.3	1	
Over-weight (25<BMI<30)	9.2	1.3 (0.99-3.42)*	1.12 (0.84-3.26)
Obese (BMI>30)	19.6	3.5 (1.22-4.89)***	3.68 (1.78-5.32)***

\*P<0.5, \*\*P<0.1, \*\*\*P<0.05; ±BMI (kg/m<sup>2</sup>).

this difference did not reach statistical significance (P=0.36). During the first year after birth, subjects fed on formula only, or formula and breast milk, had 1.5-fold higher risk of obesity than subjects fed on breast-milk only. When effects of maternal education level on childhood obesity were analyzed, there were no significant differences in the risk of obesity between groups. Children with divorced parents had no difference in risk of obesity than those of non-divorced parents, and it was shown that the risk of obesity falls with increasing the sibling number (Table IV).

When results of the PARI test were analyzed, 3 of the sub-categories were found to effect obesity. Children of disciplined, over protective parents and those in the parental incompatibility group had higher risk of being obese. The highest effect was seen for the parental incompatibility group (Table V).

Analysis of the DASS test results revealed that children with a mother and/or father who was depressed had a higher risk of obesity than children whose parents were not depressed (P<0.05) (Table VI).

### Discussion

Although, still not clearly elucidated, the global understanding for the mechanisms of childhood obesity is improving. It is obvious that obesity has a significant association with several other diseases and it is increasing the individual's risk of mortality and morbidity. The initial step which needs to be taken for

TABLE IV.—The effect of demographic categories on children's risk of obesity.

	Cumulative Index	Risk factor	Corrected risk factor
Gender			
Male	6.1	1	
Female	7.3	1.4 (0.65-1.63)*	1.53 (1.07-1.94)*
Working mother			
No	7.2	1	
Yes	9.6	1.36 (0.82-1.99)	1.21 (0.53-1.44)
Formula support			
No		1	
Yes		1.84 (1.02-2.33)	1.5 (0.97-2.1)
Education level			
Higher education	6.2	1	
High school	8.2	1.24 (0.92-1.68)	0.84 (0.58-1.34)
Primary school	9.3	1.47 (1.04-2.08)*	0.95 (0.59-1.37)
Non-educated	9.8	1.68 (1.39-2.42)*	0.96 (0.59-1.59)
Income			
High	3.9	1	
Moderate	7.6	1.76 (1.15-2.36)*	1.11 (0.78-1.58)
Low	10.5	2.91 (1.66-3.45)***	2.84 (1.39-3.78)**
Number of siblings			
1	3.7	1	
2	8.3	2.32 (1.39-3.74)**	2.28 (1.43-4.27)**
>3	9.3	2.64 (1.66-4.08)**	2.67 (1.20-4.22)*

\*P<0.5, \*\*P<0.1, \*\*\*P<0.05.

the prevention and treatment of obesity is the change in lifestyle. This starts from the family itself and the relationships between the parents and children are need to be revisited. In this research, we have tried to discuss the precautions related to familial risk factors in the development of obesity.

If one, or both, parents are obese, the risk of obesity for their children increases (26). This finding was confirmed in a study and a correlation between the BMI of mothers and their children has been shown. Accordingly, if a mother's BMI is higher than 30, the risk of obesity in her child is 3.68 times higher. This

TABLE V.—PARI classification. Effects on children's risk of obesity.

Pari sub-groups	Cumulative Index	Risk factor	Corrected risk factor
Democracy	3.4	1	
Refusal of housewife role	3.6	1.1 (0.62-1.43)	0.78 (0.42-1.12)
Disciplined	5.2	1.5 (0.96-2.3)*	1.2 (0.98-1.58)
Overprotective	6.3	1.8 (1.02-3.48)*	1.74 (1.15-2.67)*
Parental incompatibility	7.2	2.3 (1.10-4.72)**	2.5 (1.39-4.25)**

\*P<0.5, \*\*P<0.1, \*\*\*P<0.05.

TABLE VI.—Effect of DASS score on children's risk of obesity.

DASS Score	Cumulative Index	Risk factor	Corrected risk factor
Depression	4.3	1	
Not depressed	7.3	2.4 (1.20-4.82)**	2.0 (1.15-4.24)**

\*\*P<0.05.

is thought to be related to genetic and environmental factors (lifestyle and eating habits).

Another factor which needs to be taken into account is the socioeconomic status of the family. The prevalence of obesity in children of parents with higher incomes is lower than that of society in general.<sup>26</sup> In other words, if family income is low, a child's obesity risk increases by 2.84 times. As family income decreases, the frequency of unvaried high-calorie diets and unhealthy eating habits increases which results with obesity.

The risk of obesity for children who were formula fed during the first year of life is 1.5-fold higher than for those who were fed breast-milk only. This result is also in compliance with the previous report which demonstrates that feeding with formula increased the risk of obesity by 2.5-fold.<sup>27</sup>

In our research, the risk of obesity in children whose mothers worked was slightly higher, although this result was not statistically significant. This is in agreement with other studies.<sup>28</sup> The risk of obesity increases as sibling number increases, we found that, when compared with society in general, the risk of obesity for a child with two siblings is 2.28-fold higher, and the risk of obesity for a child with 3 siblings is 2.67-fold higher. Similar studies show that the risk with 1 sibling is 1.68-fold higher and that with 2 siblings is 1.87-fold higher. It is thought that as the number of siblings increases, the time a mother has to attend to each child decreases, leading to a less-varied diet

and increase in fast food consumption resulting in weight gain.<sup>29</sup>

The psychological well-being of parents and their approach to their children are factors in obesity that do not receive as much attention as they should. It is known that stress, anxiety, and depressive symptoms in parents are related to excess weight and obesity in their children.<sup>30, 31</sup> In addition, we have found that depression in mothers leads to a 2-fold higher risk of obesity in their children. One might speculate that in children whose parents are depressive are less likely to eat breakfast, have a higher fast-food consumption, and spend more time watching television which results with obesity.

Having a mother with strict behaviors and excessive control over their child's feeding habits are directly related to a child's risk of obesity.<sup>32, 33</sup> Based on classifications from the PARI scale we found that the risk of obesity for children whose mothers are disciplined is 1.2-fold higher. Moreover for children whose mothers are excessively protective, it is 1.74-fold higher. These attitudes in mothers can lead to a decrease in physical activity of their children which results with obesity.

In this study, we did not mention biochemical parameters because all participant were in normal ranges. As a matter of fact that biochemical parameters were measured to excluded obesity with comorbidity such as metabolic conditions. Taken all together, although many factors are associated, we found that the personal characteristics of the parents and their relationship with their children significantly effect the risks of childhood obesity. Preventive steps should be taken in order to decrease the incidence of this global disease.

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## References

- Brownell KD, Wadden TA. Etiology and treatment of obesity: understanding a serious, prevalent, and refractory disorder. *J Consult Clin Psychol* 1992;60:505-17.
- Magarey AM, Daniels LA, Boulton TJ, Cockington RA. Predicting obesity in early adulthood from childhood and parental obesity. *International journal of obesity and related metabolic disorders*. *Obes Rev* 2003;27:505-13.
- Kelsey MM, Zaepfel A, Bjornstad P, Nadeau KJ. Age-related consequences of childhood obesity. *Gerontology* 2014;60:222-8.
- Robinson TN. Defining obesity in children and adolescents: clinical approaches. *Crit Rev Food Sci Nutr* 1993;33:313-20.
- Frisancho AR. Anthropometric standards for the assessment of growth and nutritional status. Ann Arbor, MI: University of Michigan Press, 1990.
- Xu H, Wen LM, Rissel C, Flood VMi Baur LA. Parenting style and dietary behaviour of young children. Findings from the Healthy Beginnings Trial. *Appetite* 2013;71:171-7.
- Vollmer RL, Mobley AR. Parenting styles, feeding styles, and their influence on child obesogenic behaviors and body weight. A review. *Appetite* 2013;71:232-41.
- Rhee KE, Pan TY, Norman GJ, Crow S, Boutelle K. Relationship between maternal parenting and eating self-efficacy in overweight children when stressed. *Eat Weight Disord* 2013;18:283-8.
- De Bourdeaudhuij I, Te Velde SJ, Maes L, Pérez-Rodrigo C, de Almeida MD, Brug J. General parenting styles are not strongly associated with fruit and vegetable intake and social-environmental correlates among 11-year-old children in four countries in Europe. *Public Health Nutr* 2009;12:259-66.
- Rodenburg G, Oenema A, Kremers SP, van de Mheen D. Parental and child fruit consumption in the context of general parenting, parental education and ethnic background. *Appetite* 2012;58:364-72.
- Vereecken C, Rovner A, Maes L. Associations of parenting styles, parental feeding practices and child characteristics with young children's fruit and vegetable consumption. *Appetite* 2010;55:589-96.
- Wake M, Nicholson JM, Hardy P, Smith K. Preschooler obesity and parenting styles of mothers and fathers: Australian national population study. *Pediatrics* 2007;120:1520-7.
- Halliday JA, Palma CL, Mellor D, Green J, Renzaho AM. The relationship between family functioning and child and adolescent overweight and obesity: a systematic review. *Int J Obes* 2014;38:480-93.
- Bronte-Tinkew J, Zaslow M, Capps R, Horowitz A, McNamara M. Food insecurity works through depression, parenting, and infant feeding to influence overweight and health in toddlers. *J Nutr* 2007;137:2160-5.
- Lytle L, Hearst MO, Fulkerson J, Murray DM, Martinson B, Klein E. Examining the relationships between family meal practices, family strengths, and the weight of youth in the family. *Ann Behav Med* 2011;41:353-62.
- Darling N, Steinberg L. Parenting style as context: An Integrative model. *Psychol Bull* 1993;113:487-96.
- Davison KK, Birch LL. Childhood overweight: a contextual model and recommendations for future research. *Obes Rev* 2001;2:159-71.
- Rhee KE, Lumeng JC, Appugliese DP, Kaciroti N, Bradley RH. Parenting styles and overweight status in first grade. *Pediatrics* 2006;117:2047-54.
- Gemmill AW, Worotniuk T, Holt CJ, Skouteris H, Milgrom J. Maternal psychological factors and controlled child feeding practices in relation to child body mass index. *Child Obes* 2013;9:326-37.
- Hatipoglu N, Ozturk A, Mazicioglu MM, Kurtoglu S, Seyhan S, Lokoglu F. Waist circumference percentiles for 7- to 17-year-old Turkish children and adolescents. *Eur J Pediatr* 2008;167:383-9.
- Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. Establishing a standard definition for child overweight and obesity worldwide: international survey. *BMJ* 2000;320:1240-3.
- Neyzi O, Gunoz H. Buyume ve gelisme bozukluklari. In: Neyzi O, Ertugrul T, editors. *Pediatric*. Second edition. Istanbul: Nobel Tip Kitabev;1993. p. 69-102 [in Turkish].
- Rosner B, Prineas RJ, Loggie JM, Daniels SR. Blood pressure nomograms for children and adolescents, by height, sex, and age, in the United States. *J Pediatr* 1993;123:871-86.
- Le Compte G, Le Compte A, Özer S. Üç sosyoekonomik düzeyde Ankaralı annelerin çocuk yetiştirme tutumları: Bir ölçek uyarlaması. *Turk Psik Derg* 1978;1:5-8.
- Akın A, Çetin B. Depression Anxiety and Stress Scale (DASS): The study of validity and reliability. *Educ Sci* 2007;7:241-68.
- St-Onge MP, Heymsfield SB. Overweight and obesity status are linked to lower life expectancy. *Nutr Rev* 2003;61:313-6.
- Agras WS, Hammer LD, McNicholas F, Kraemer HC. Risk factors for childhood overweight: a prospective study from birth to 9.5 years. *J Pediatr* 2004;145:20-5.
- Eriksson J, Forsen T, Osmond C, Barker D. Obesity from cradle to grave. *Int J Obes Relat Metab Disord* 2003;27:722-7.
- Gibbs BG, Forste R. Socioeconomic status, infant feeding practices and early childhood obesity. *Pediatr Obes* 2014;9:135-46.
- Branco S, Jorge Mdo S, Chaves H. Childhood obesity: a health care centre reality. *Acta Med Port* 2011;24(Suppl2):509-16.
- Gwozdz W, Sousa-Poza A, Reisch LA, Ahrens W, Eiben G, M Fernández-Alvira J, et al. Maternal employment and childhood obesity--a European perspective. *J Health Econ* 2013;32:728-42.
- Epstein LH, Wisniewski L, Weng R. Child and parent psychological problems influence child weight control. *Obes Res* 1994;2:509-15.
- Gross RS, Velazco NK, Briggs RD, Racine AD. Maternal depressive symptoms and child obesity in low-income urban families. *Acad Pediatr* 2013;13:356-63.

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