

# Exploring the Levels of Parental Perception and Stress among Parents Having an Obese or overweight Children Aged 7-12 Years: South of Jordan

Sonia Kreshan\*, Basil Amareh

<sup>1</sup>Faculty of Nursing, Jordan University of Science and Technology, Jordan

<sup>2</sup>Department of Community Health, Mental Health & Administration, Jordan University of Science & Technology, Jordan

## Abstract

**Background:** Obesity and overweight one of the most critical public health confrontations. It is a leading cause for many of the common health problems among children. The level of Parent's perception about their children weight status is mainly play a major role in the childhood obesity's development and management.

**Aims:** this study aimed to explore parental stress and perception related to obesity or overweight, during childhood period aged seven to twelve years, as well as, to estimate the prevalence of obesity and overweight for the same age group.

**Methods:** A cross-sectional design study was conduct in 2017 at 27 governmental and private elementary schools in Aqaba, Jordan. Throught a multi stage cluster sampling method,a total of 704 parents of children were recruited. The Obesity Parental Perception Scale (OPPS), the Parental Stress Measurement Scale (PSMS) were used.

**Results:** The prevalence of obesity and overweight among children was 7.5%. The highest parent's perception levels was 71.7% of the parent's had semi-adequate perception about the weight of their children .54.3%of the parents had experienced high-stress level. Parental perception levels showed significant association with educational levels of parents.

**Conclusion:** Overweight and obesity are becoming a health problem among children in Jordan. More than half of the parents had experienced high-stress level related to their children weight status. Developing community awareness, decreasing parental stress, improving parents' perception, and reinforcing healthy lifestyle not only for the children but also for the family are needed.

**Keywords:** Obesity; Overweight; Perception; Children; Stress; Parent

## Introduction

Developed and developing countries are facing the rising in the prevalence of overweight and obesity among children and adolescents, but with different speeds and in different patterns [1,2].The prevalence has been estimated that in the latest three decades there has been a double surge in childhood obesity among children, while among adolescents it has quadrupled [3]. As stated by The International Obesity Task Force report, in developed and developing countries, forty to fifty million young children are considered to be obese or overweight [4].

The main causation of overweight and obesity is the intake of foods that are high in saturated fat and sugars, reduction in physical activity which is resulted by sedentary lifestyle, urbanization, and the globalization of food markets [5,6].

Obesity and overweight among children and adolescents are elevated risk for many of health problems, cardiovascular disease, high blood pressure, diabetes, orthopedic complications, skin problems, high blood lipids and psychosocial problems [3,5,7,8].

Understanding parent's knowledge, attitudes, and beliefs about the weight status of their children is highly essential in order to appropriately plan to control the weight of their children through applying lifestyle for their children that are considered to be healthier and to deal with the epidemic of obesity [9]. Parental perception contributes in supporting children, as well as, adolescent to adopt a healthy weight-related behavior, which is important for the success of early prevention of the childhood obesity. Few research studies conducted to investigate the perception of parents regarding obesity among children and stressors associated with childhood obesity, in Arab countries. Also, similar published studies are limited in Jordan. The purposes of the present study were to explore parental stressors and perception related to

obesity or overweight, during childhood period aged seven to twelve years, as well as, to estimate the prevalence of obesity and overweight for the same age group in Aqaba Governorate, Jordan.

## Methodology

A cross-sectional design study was used to collect data from children attending the public and private elementary schools in Aqaba Governorate and their parents during the period September 10, 2017, and ended on October7, 2017. Aqaba is located about 330 Km south of Amman. It has 34 governmental schools and 26 private schools. Ethical approval to carry out study was granted by the Institutional Review Board at Jordan University of Science and technology and from The Ministry of Education prior to data collection. Parents were notified about the aim of the study, and they were assured that participating in the study is voluntary, no personal identification was included with the data to maintain anonymity. The data collection procedure was conducted in the private room to ensure the privacy of each student.

## Sampling

A multistage cluster sampling method was used for the current study

**\*Corresponding author:** Sonia Kreshan, Faculty of Nursing, Jordan University of Science and Technology, Jordan, Tel: 00962799728271, E-mail: [soniakreshan@yahoo.com](mailto:soniakreshan@yahoo.com)

**Received** September 29, 2020; **Accepted** October 19, 2020; **Published** October 26, 2020

**Citation:** Kreshan S, Amareh B (2020) Exploring the Levels of Parental Perception and Stress among Parents Having an Obese or overweight Children Aged 7-12 Years: South of Jordan. J Comm Pub Health Nursing 6: 253.

**Copyright:** © 2020 Kreshan S, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

went through two phases. The first phase was to select the participating schools representing government and private sector, in order to for the school to be selected; the schools must be located in Aqaba Governorate, and the school teaches the first to the sixth grades for both genders, 27 schools (13, public, and 14, private schools) met the criteria. The second phase is selecting the children from schools. The participants were children aged between seven and twelve years attending first to six grade classes and their parents who agreed to participate, and child BMI is at/or above the 85th percentile. From 13175 students, 6104 children were in governmental schools and 7071 were in the private schools, which were between seven and twelve years old. Children who met the inclusion criteria were 989 in both sectors. About 744 were participated in the study. The response rate 71%, which mean the total number of handed back questionnaires was 744, and 40 of the questionnaires were excluded as they were not fully filled by the participants.

Effect size was calculated using the Post-hoc G\* Power software. The current study sample was 704 children and their parents, G\* Power showed a large effect size 0.7.

### Data collection

Structured instruments were used, which consisted Socio-Demographic Datasheet, the Obesity Parental Perception Scale (OPPS), the Parental Stress Measurement Scale (PSMS) [10]. Also, the Children's Body Image Scale (CBIS) [11]. The child's demographic data comprised of age, gender, body height, body weight, school type (governmental or private). The parent's socio-demographic data and reported biometric data including age, weight and height, working status, the educational level, and the total of family members, the family monthly income, and the total number of family meals weekly purchased from fast food restaurant. OPPS is self-administered questionnaires, consisting of 22 questions divided into three categories; parental perception of obesity caused in childhood, parental perception of obesity in adulthood, and parental perception of obesity consequences in adulthood. The four-point Likert Scale was used to measure the parent's perception regarding childhood obesity (1=strongly disagree, 2=disagree, 3= agree, and 4=strongly agree). PSMS is self-administered questionnaires, consisting of 39 items. A five-point Likert Scale was used to determine parental stressors associated with their child who was obese or overweight (1=never, 2=rarely, 3=sometimes, 4=often, 5=very often); the scale was fluctuating from 1, showing the minimum stress-related response to 5, showing the maximum stress-related response. CBIS was used to scrutinize the accuracy of parents' perception of their children's body size through comparing the differences between actual, perceived and desired children body size, was applied. CBIS which a series of body figures fluctuating from very thin, which was symbolized with an A, to obese, which was symbolized with a G, were presented to children.

BMI, participants were asked to take off shoes and heavy clothing before the child height and weight measured. To the nearest tenth of a point, height was recorded in centimeters, while weight was recorded in kilograms through using digital scale. Calculating children's BMI scores was done using the CDC standard criteria for boys and girls between 2 and 20 years old. Children were classified as overweight weight if their BMI was at/or above the 85th percentile and less than the 95th percentile and they were considered to have obese weight if their BMI was at/or above the 95th percentile. BMI was obtained by dividing the weight in kilogram by square of height in centimeters then the value is multiplied with ten thousand [12].

### Data Analysis

Data were managed and analyzed using SPSS, version 22. Descriptive statistics such as percentages; minimum and maximum,

standard deviation, frequencies, mode, and means. Chi-square was used to determine the association between the variables. Correlation was used to explore the strength of relation between the variables. P-value <0.05 was considered as statistically significant.

### Results

Total of 704 children's parents, out of 13175 of the screened children were obese or overweight with a mean age 9.7 years (SD 1.65). 42.8% (n=301) were male children, BMI of the children ranged between 18 and 48 corresponded to percentile, with a mean of 25.955 percentile (SD=4.22). Furthermore, 85.8% (n=604) were obese children, 59.1% (n=416) of the screened children came from private schools. Findings showed that the total of child's father were with a mean age of 43.82 years (SD=6.79) and half of them had been completed the high school level. The majority of them were employed 89.9% (n=633). The mothers' age with a mean of 37.9 years (SD=6.052) and (49.1%) of the mothers finished the high school level. 25.6% of them were employed, 25.3% (n=178) of the parents denied that their children were obese or overweight.

About 53.4% (n=376) of the participant with a family monthly income, was between 500-1000 JD. The parents showed high concern about their child's weight (60.7%). In addition, 23.2% (n=163) of the parent's perceived their children as obese. The majority of the parents said that they purchased family meal once or twice weekly from a fast food restaurant 95.2% (n=669). 43.2% (n=304) of the parents expressed that their children's did not exercise enough. Interestingly, 60.9% (n=429) of the parents considered that their children followed the right eating habits (Table 1).

Results of correlations analysis indicated positive relationship with significant correlations between fathers' weight ( $r=0.152, p=0.003$ ), and mothers' weight ( $r=0.191, p=0.001$ ) with their children BMI. Positive relationship with significant correlations between fathers' age ( $r=0.111, p=0.004$ ), and mothers' age ( $r=0.160, p=0.007$ ) with their children's BMI. Negative relationship with significant correlations between fathers' educational level ( $r=-0.075, p=0.001$ ) and mothers' educational level ( $r=-0.056, p=0.009$ ) with their children's BMI.

### The prevalence of obesity and overweight

The prevalence of obesity and overweight among children was 7.5%. More specifically, the prevalence in private and governmental schools was 8.3 %, and 6.5 % respectively.

### Parental perception levels of overweight or obese

The study showed that the highest parent's perception levels was 71.7% (n=505) of the parents had semi-adequate perception about the weight status of their children. Moreover, the results of this study revealed that 81.0% (n=570) of the parents had semi-adequate perception of regarding childhood obesity. 85.4% (n=601) of the parents had fully-adequate perception of the reasons behind their childhood obesity. 54.1% (n=381) of the parents had semi-adequate perception of obesity consequences among their children (Table 2).

According to CBIS, 45.2% (n=318) of the parents underestimated their children's body size with the identical body figure BMI. 33.1% (n=233) of the parents choose underweight figure as an ideal for their children.

The results stated that 54.3% (n=282) of the parents had experienced high-stress level which measured by PSMS. After using Chi-square analysis, there is significant associations between gender of children, school types and parental stress levels among parents [ $\chi^2(1) 32.274, P=0.000$ ], [ $\chi^2(1) 23.274, P=0.00$ ] respectively. In addition, there is significant associations between parental perception levels

Variables	n (%)
Father employees	
Yes	633 (89.9)
No	71 (10.1)
Father educational level	
Preparatory or less	120 (17)
High school	63 (51.6)
Diploma	20 (2.8)
Bachelor	185 (26.3)
Graduate Education	16 (2.3)
Mother's employee	
Yes	180 (25.6)
No	542 (74.4)
Educational level of mothers	
Preparatory or less	89 (12.6)
High school	346 (49.1)
Diploma	50 (7.1)
Bachelor	206 (29.3)
Graduate Education	13 (1.8)
Parents are concerned about their child's weight	
Not at all	13 (1.8)
A little	95 (13.5)
Mild	169 (24)
Very concerned	42 (60.7)
Parents feelings about weight of their child	
About the right weight	108 (15.3)
Overweight	433 (61.5)
Obese	163 (23.2)
Fast food eating	
1 to 2 time	669 (95.2)
3 – 4 time	20 (2.8)
5-6 time	14 (2)
Child exercise	
Not enough	304 (43.2)
Just right	150 (21.3)
Too much	34 (4.8)
Not doing at all	216 (30.7)
Parents thinking about their child eats habit	
Too little	30 (4.3)
Just right	429 (60.9)
Too much	245 (34.8)

Table 1: Demographic Characteristics for Participants.

Variables	Inadequate perception n (%)	Semi-adequate perception n (%)	Fully- adequate perception n (%)
Parental perception levels of overweight or obese among their children	82 (11.6)	505 (71.7)	117 (16.6)
The perception levels of parents regarding the causation of childhood obesity	13 (1.8)	90 (12.8)	601 (85.4)
The levels of perception of parents regarding childhood obesity	123 (18.9)	570 (81)	11 (0.1)
The levels of perception of parents of the childhood obesity consequences	44 (6.3)	381 (54.1)	279 (93.6)

Table 2: The levels of parental perception.

among parents and the educational level for both fathers and mothers [  $\chi^2(8)21.393, P=0.006$ ], [  $\chi^2(8) 29.712, P=0.000$ ] respectively.

## Discussion

Developed and developing countries are facing the epidemic of overweight and obesity. According to CDC standard criteria, a child's

weight status is determined using an age- and sex-specific percentile for BMI, the prevalence of obesity and overweight among children aged 7-12 years old for the current study was 7.5%, a lower result than the previously estimated ones in Irbid governorate in Jordan, 20.4% [13], 24.4% [14], beside, 25% [15]. These studies had different methodologies and age group of the sample studied.

Moreover, the prevalence of the current study is lower than other several studies worldwide. 18% in the United States [16,17], higher than 15% in countries like China, Mexico, Argentina, India and Brazil [18], Besides, 12.7% in Canada [19]. In Eastern Mediterranean Region EMR, obesity status has touched a disquieting level in all age groups [1]. In Saudi Arabia, the prevalence of obesity for children aged five to eighteen years 23.1% is overweight, 9.3% is obesity, and 2% is severe obesity [20]. While in Egypt, the prevalence of obesity for children aged six to twelve years 17.7% overweight and 13.5% are considered obese [21]. Moreover, in Iran the prevalence of overweight and obesity in children aged between six and eighteen years was 9.27% and 3.22% respectively [22].

Alarming, in the United Arab Emirates UAE, the prevalence of obesity and overweight among children was reported that 40% to be overweight, 24.4 % to be obese, and 5.7% to be severe obese [23]. Also in Iraq, the prevalence of obesity and overweight was 24.1% (13.6% overweight and 10.5% obese) [24]. These differences in the estimated prevalence of across studies are clear due to different methodologies, and populations of each study.

The study has also showed that 15.3% of the parents indicated that their children has the right weight, while the most of the parents have perceived their children as overweight. Then again, 23.2% of the parents perceived their children to be obese. Also, 25.3% of the parents denied that their children were obese or overweight despite the fact that all participated children were either overweight or obese. These results matches the results of several studies [25-30]. This failure, which parents had, in defining that their children were either overweight or obese could be due to the unwillingness of parents to admit that their children were overweight and obese or due to their lack of correctly defining the meaning of overweight and obese.

Furthermore, the majority of the parents had semi-adequate perception of regarding childhood obesity, the parents showed worrisome about the weight of their children and perceived that decreasing childhood obesity is easier than reducing obesity in adulthood. Additionally, the parents perceived that their obese children are more likely to become obese in their adulthood. These results are consistent with a study [9].

In addition, 85.4% of the parents had fully-adequate perception of the reasons behind their childhood obesity, 95.2% of the parents said that they purchased family meal from once or twice from a fast food restaurant every week, which could be one of the causes of childhood obesity along with the effect of the mass media, which promote fast food. Another predispose child to obesity was the lack of physical activity either at home or school, which could affect the body weight of the children, which means that the consumed quantity of food is not the only cause of childhood obesity. These results were congruent with studies [9,31,32].

In the current study, parents believe that exercises and eating habits of parents might affect their children's eating and exercising habits. In addition to that, the hereditary within the family notably plays a significant role in childhood obesity. Furthermore, the parents said that they had the ability to affect their child's physical activity and food choices. These results are similar to the results of a study [33].

The current study results disclosed that the majority of parents had semi-adequate perception of obesity consequences among their children either physical or psychological health problems. Which showed that most parents predicted long-term risks for developing obesity-related chronic health conditions, such as hypertension, heart disease, depression, and diabetes. These results are consistent with studies [9,34,35].

CBIS, half of the parents underestimated their children's body size with the identical body figure BMI. The parents' underestimation was because many of the children at the beginning of being obese look nearly to be overweight rather than obese or because parents' emotional feeling related to their body weight of children. These results are reliable with other studies [11,33].

The result revealed that the parents are experiencing high levels of parental stress; this result determined the degree of parental stress of the current study, which is linked to the obesity their children experience, which is also alike to the stress that disturbs parents whose children suffer from cancer, diabetes, and other chronic illnesses; as it was uncovered in the study [36].

The high parental stress among parents of overweight and obese children was driven through the fear most parents face regarding health consequences of obesity on their children. These findings are similar to the ones confirmed by studies [37-39].

In addition, there was a significant association unveiled in this study between the levels of parental perception among parents of overweight or obese children and fathers and mothers' educational level. These results are consistent with the study [27], which revealed that the maternal education level was correlated with the maternal capability to recognize the weight status of their children accurately. Besides, another study has found that the educational level of the mothers was respectively associated with appropriate perception of weight status of their children [9,28,40]. This could be related to the differences not only in educational levels and educational systems in the countries which the parents came from but also in their different cultural background. On the contrary, of the current study results, the study, divulged that the parent's level of education was not remarkably correlated with the accuracy of perception they held about the weight status of the child [41].

## Strengths

The current study is considered as one of the leading studies in investigating stressors related to obesity or overweight during childhood period, as well as, examining the perception of parents regarding children in Jordan. In addition, it's primary in estimating the prevalence of obesity and overweight in the South of Jordan. Moreover it will establish proper database to uncover the significance and effect of this health problem in Jordan. There was a limited number of studies carried out in the Middle East and the worldwide to examine stressors related to childhood obesity. Finally the current study had a large effective sample size.

## Limitations

Using of self-reported questionnaire which could have probable response set bias in answering the question or answering it without reading. Add to that , using closed-ended questions in the current study did not allow the researcher to investigate the parents' inability to perceive their children's weight status of being obese or overweight, and what might bother or permit parent's adequate expression about their point of view regarding their obese or overweight child's status which eventually lead them to stress. Finally, the length of the questionnaire for participated parents discouraged some parents from filling all the questions or even participating in this study.

## Conclusion

Obesity and overweight, among children and adolescents, have turned into a crisis in public health and community worldwide also

among Jordanian; it is a leading cause for many of the common health problems children face. The prevalence of obesity and overweight among children was 7.5%. Overweight and obesity are becoming a health problem among children in Jordan. This study reported the majority of the parents had semi-adequate perception about the weight status of their children. More than half of the parents had experienced high-stress level related to their children weight status. Moreover, the weight, the age, and the educational level of both fathers and mothers were statistically significant associated with their children BMI. Early parents perception and concern of their child's weight status allow them to overcome the barriers and helping their children to maintain or achieve healthy weight, which prohibit childhood obesity.

## Recommendations

We recommend conducting more studies which should be covering a wider geographical area. In addition, a future study should contain a mix methodology to allow the researcher to investigate the reasons behind parents inability to perceive their children's weight status of being obese or overweight. We also recommend to expand the percentage of schools, which offer comprehensive school health education programs based on CDC school health guidelines, which aim attention at physical activity, healthy eating, and eliminating screen time to popularize healthy weight. State policies and strategies to impede parental stress and improve parental perception among parents whose children are obese or overweight with cooperation of The Ministry of Education, The Ministry of Health, governmental and non-governmental organizations. Moreover, applied and assessed comprehensive public health programs, in order to develop community awareness, decreasing parental stress, improving parents' perception, and reinforcing healthy lifestyle not only for the children but also for the family.

## References

- Musaiger AO (2011) Overweight and obesity in eastern Mediterranean region: prevalence and possible causes. *J Obesity* 18: 2011.
- World Health Organization (2014) Childhood overweight and obesity. *Diet, Physical Activity Health*.
- Center of Disease and Control Prevention (2015) Childhood overweight and obesity. *CDCP* 18: 2015.
- [http://www.iaso.org/iotf/obesity/obesitytheglobal epidemic/](http://www.iaso.org/iotf/obesity/obesitytheglobal%20epidemic/) on 20 September 2012
- World Health Organization (2014) Childhood overweight and obesity. *Diet, Physical Activity and Health*.
- <http://www.cdc.gov/obesity/downloads/childrensfoodenvironment.pdf>
- Taylor VH, Forhan M, Vigod SN, McIntyre RS, Morrison KM (2013) The impact of obesity on quality of life. *Clinical Endocrinol Metabol* 27:139-146.
- Halfon N, Larson K, Slusser W (2013) Associations between obesity and comorbid mental health, developmental, and physical health conditions in a nationally representative sample of US children aged 10 to 17. *Academic Pediatrics* 13:6-13.
- Sarrafzadegan N, Rabiei K, Nouri F, Mohammadifard N, Moattar F, et al. (2013) Parental perceptions of weight status of their children. *ARYA Atheroscl* 9:61.
- Sbait AN, Omar S (2016) parents' perceptions and parental stress related obesity of children in united arab emirates. *J Family Community Med* 23:179-183.
- Truby H, Paxton SJ (2002) Development of the children's body image scale. *Br J Clin Psychol* 41:185-203.
- Center of Disease and Control Prevention (2016b) Defining adult overweight and obesity. *Obese* 1.
- Hamaideh SH, Al-Khateeb RY, Al-Rawashdeh AB (2010) Overweight and obesity and their correlates among Jordanian adolescents. *J Nurs Scholarsh* 42:387-394.
- Baker NA, Daradkeh SM (2010) Prevalence of overweight and obesity among adolescents in Irbid governorate, Jordan. *East Mediterr Health J* 16:657-662.
- Khader Y, Irshaidat O, Khasawneh M, Amarin Z, Alomari M, et al. (2009) Overweight and obesity among school children in Jordan: prevalence and associated factors. *Matern Child Health J* 13:424-431.
- Fryar CD, Carroll MD, Ogden CL (2012) Prevalence of obesity among children and adolescents: United States, trends 1963-1965 through 2009-2010. *NCHS* 1960:1-6.
- Ogden CL, Carroll MD, Kit BK, Flegal KM (2014) Prevalence of childhood and adult obesity in the United States, 2011-2012. *JAMA* 311:806-814.
- Gupta N, Goel K, Shah P, Misra A (2012) Childhood obesity in developing countries: epidemiology, determinants, and prevention. *Endocrine reviews* 33:48-70.
- Roberts KC, Shields M, de Groh M, Aziz A, Gilbert JA (2012) Overweight and obesity in children and adolescents: results from the 2009 to 2011 Canadian Health Measures Survey. *Health Rep* 23:37-41.
- Al Shehri A, Al Fattani A, Al Alwan I (2013) Obesity among Saudi children. *Saudi J Obes* 1:3.
- Badawi NE, Barakat AA, El Sherbini SA, Fawzy HM (2013) Prevalence of overweight and obesity in primary school children in Port Said city. *Egyptian Pediatr Asso Gazette* 61:31-36.
- Mirmohammadi SJ, Hafezi R, Mehrparvar AH, Rezaeian B, Akbari H (2011) Prevalence of overweight and obesity among Iranian school children in different ethnicities. *Iran J Pediatr* 21:514-520.
- AlBlooshi A, Shaban S, AlTunaiji M, Fares N, AlShehhi L, et al.(2016) Increasing obesity rates in school children in United Arab Emirates. *Obes Sci Pract* 2:196-202.
- Ajeel NA (2013) Prevalence of Overweight and Obesity among Public Primary School Children in Basrah City. *Iraqi J Community Med* 26:103-108.
- Al-Mohaimeed AA (2016) Parents' perception of children's obesity, in Al-Qassim, Saudi Arabia. *J Family Community Med* 23:179-183.
- Lampard AM, Byrne SM, Zubrick SR, Davis EA (2008) Parents' concern about their children's weight. *Pediatr Obes* 3:84-92.
- Kiliçarslan-Törüner E, Ayaz S, Savaşer S (2014) Parents' perceptions about weights of their children. *Dergisi* 16:11-20.
- Almoosawi S, Jones AR, Parkinson KN, Pearce MS, Collins H, et al. (2016) Parental perception of weight status: Influence on children's diet in the Gates head Millennium Study. *PLoS One* 11:e0144931.
- Crawford D, Timperio A, Telford A, Salmon J (2006) Parental concerns about childhood obesity and the strategies employed to prevent unhealthy weight gain in children. *Public Health Nutr* 9:889-895.
- Guevara-Cruz M, Serralde-Zuniga AE, Frigolet Vázquez-Vela M, Blancas Galicia L, Islas-Ortega L (2012) Association between maternal perceptions and actual nutritional status for children in a study group in Mexico. *Nutr Hosp* 27:209-212.
- Hardus PM, Van Vuuren CL, Crawford D, Worsley A (2003) Public perceptions of the causes and prevention of obesity among primary school children. *Int J Obes* 27:1465-1471.
- Schwartz M (2015) Parental perceptions of body mass index notification: a qualitative study. *J Sch Health* 85:714-721.
- Eckstein KC, Mikhail LM, Ariza AJ, Thomson JS, Millard SC, et al. (2016) Parents' perceptions of their child's weight and health. *Pediatrics* 117:681-690.
- Rietmeijer-Mentink M, Paulis WD, Middelkoop M, Bindels PJ, Wouden JC (2013) Difference between parental perception and actual weight status of children: a systematic review. *Matern Child Nutr*. 9:3-22.
- Wright DR, Lozano P, Dawson-Hahn E, Christakis DA, Haaland WL, et al. (2016) Parental predictions and perceptions regarding long-term childhood obesity-related health risks. *Acad Pediatr* 16:475-481.
- Ohleyer V, Freddo M, Bagner DM, Simons LE, Geffken GR, et al. (2007) Disease-related stress in parents of children who are overweight: relations with parental anxiety and childhood psychosocial functioning. *J Child Health Care* 11:132-142.

- 
37. Simons LG, Granberg E, Chen YF, Simons RL, Conger RD, et al. (2008) Differences between European Americans and African Americans in the Association between Child Obesity and Disrupted Parenting. *J Comp Fam Stud* 39:589.
  38. Shankardass K, McConnell R, Jerrett M, Lam C, Wolch J, et al. (2014) Parental stress increases body mass index trajectory in pre-adolescents. *Pediatr Obese* 9:435-442.
  39. Tate EB, Wood W, Liao Y, Dunton GF (2015) Do stressed mothers have heavier children? A meta-analysis on the relationship between maternal stress and child body mass index. *Obes Rev* 16:351-361.
  40. Maynard LM, Galuska DA, Blanck HM, Serdula MK (2003) Maternal perceptions of weight status of children. *Pediatrics* 111:1226-1231.
  41. Muhammad NA, Omar K, Shah SA, Arshad F (2008) Parental Perception of Their Children. *Asia Pac J Clin Nutr* 17:597-602.