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# Parents' perceptions about weights of their children

# Anne babaların çocuklarının kiloları hakkındaki algıları

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***Original Article***

**Abstract**

***Objective:*** This study was conducted to compare children's actual weight status with their mothers' and fathers' perceptions.
***Method:*** In this cross-sectional descriptive study, 740 children in grades 1 to 5, 736 mothers and 712 fathers of these children were included. Children's weight and height were measured and BMIs were calculated.
***Result:*** Children's actual weight status (8% underweight and 20.1% overweight or obese) was different from mothers' and fathers' perceptions ($p < 0.05$). Parents were more likely to perceive the actual weight as being underweight than as being overweight or obese. Factors such as parental age, parental body mass indexes, child gender, child age were not associated with parental ability to perceive their children weight status accurately.
***Conclusion:*** Most of the parents have not recognized the overweight or obesity in their children. Nurses should develop~~ed~~ appropriate and effective strategies to help parents recognize their children's actual weight status. Preventing the parental misperception about their overweight or obese children as underweight or healthy by education could lead to achievement of healthy life-styles regarding nutrition, physical activity and time spent for TV watching.

***Keywords:*** Child, parent, weight,perception,pediatric nursing

**Özet**

***Amaç:*** Bu çalışma, çocukların ölçülen vücut ağırlığı durumları ile anne ve babalarının algılarının karşılaştırılması amacıyla gerçekleştirilmiştir.

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***Yöntem:*** Bu kesitsel tanımlayıcı çalışmaya 1-5. sınıflardan 740 çocuk, 736 anne ve 712 baba dahil edilmiştir. Çocukları vücut ağırlıkları ve boy uzunlukları ölçüldükten sonar vücut kitle indeksleri hesaplanmıştır.
***Bulgular:*** Çocukların ölçülen vücut ağırlığı durumları (%8 az kilolu and %20,1 obezite yönünden risk ya da obez) annelerin ve babaların algılarından farklı bulunmuştur ($p$ < 0,05). Ebeveynlerin çocuklarının gerçek vücut ağırlıklarını genellikle obezite yönünden risk ya da obez olma durumuna göre daha çok az kilolu olarak algıladıkları belirlenmiştir. Ebeveynin yaşı, ebeveynin vücut kitle indeksi, çocuğun cinsiyeti, çocuğun yaşı gibi faktörler ebeveynlerin çocuklarının vücut ağırlığı durumlarını doğru olarak algılama kabiliyetleriyle ilişkili bulunmamıştır.
***Sonuç:*** Çoğu ebeveyn çocuklarında obezite yönünden risk ya da obezite durumunu fark edememişlerdir. Hemşireler, ebeveynlerin çocuklarının gerçek vücut ağırlığı durumlarını anlamalarına yardımcı olmada uygun ve etkili stratejiler geliştirmelidirler. Ebeveynlerin obezite yönünden riskli ya da obez çocuklarını az kilolu ya da sağlıklı olarak yanlış algılamalarının eğitimle önlenmesi beslenme, fiziksel aktivite ve ekran karşısında geçirilen zamana yönelik sağlıklı yaşam stillerinin başarılmasında yol gösterici olabilir.

***Anahtar Sözcükler:*** Çocuk, anne baba, ağırlık. Algılama, pediatri hemşireliği

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**Introduction**

Obesity is an important health problem that effects all organs and systems of the body and causes various failures such as diabetes, cardiovascular diseases.[1] Obesity in childhood is also a considerable health issue in the world today.[2,3] Overweight and obesity in childhood prevalence is vary between different regions and countries, from less than 5% in Africa and parts of Asia to more than 20% in Europe and more than 30% in the Americas and some countries in the Middle East.[4] In Turkey, childhood obesity prevalence is 5% to 30.7% and these rates show that the prevalence is increased considerably in recent years.[5,6]

Obesity, which is a chronic health problem, causes health problems in children such as type 2 diabetes, cardiovascular diseases, hypertension, respiratory system diseases, sleep apnea, adult obesity, and psychological problems.[2,7,8] Apart from the many adverse health effects of obesity on children and adolescents, it causes financial problems because of the increasing burden on the economy. Therefore, national action plans are required to reduce childhood obesity.[2]

Parents have some roles to prevent childhood obesity because children's health behaviours are largely shaped by parents' knowledge and perceptions.[9,10] Parents' perceptions about their children's weight can affect their children's health because if they do not realize that obesity is preventable, risks to child health can develop later.[11]

Because of health problems and the high cost of treatment of obesity in children, precautions to prevent obesity should be taken such as health educations, cooperation between school-home and community, healthy school policies involving school cafeterias, vending machines, school-based physical activities.[3,12]

To prevent and treat childhood obesity, determining parental perceptions about children's weight is essential so that appropriate nursing interventions can be planned, applied and evaluated. There are limited studies about this topic in the literature. This is the first study to examine the perceptions of

mothers and fathers regarding their child's weight in Turkey. The purpose of this study is to determine mothers' and fathers' perceptions about their children's actual weight status. The questions asked by the study are as follows:

1. How do mothers perceive their children's actual weight?
2. How do fathers perceive their children's actual weight?
3. What is the consistency of measured BMI and the perceptions of parents?
4. Is there any relation between accuracy in identifying weight status of children and independent variables (child's age, parents' age, parents' education)?

**Method**

***Study Sample***

This descriptive study targeted a universe of 1026 children from two public elementary schools (Ulus İlk Meclis and Bahçelievler Nebahat Keskin elementary schools) in the city of Ankara, Turkey. Two public schools were selected randomly from district area of Ankara, Turkey. Sample selection was not made and all children in grades 1 to 5 and their parents were invited to participate in both schools. Data were collected between September and December 2011. The criteria for this study were: (a) children had to be in grades 1 to 5; (b) both children and their parents had to agree to participate; (c) at least one parent had to participate in the study. Five hundred and seventy-eight students enrolled from the first school but 13 students transferred to another school and nine of them were absent owing to sickness. Therefore, 556 children in the first school and their parents were sent an invitation to participate in the study. In the second school, 448 students enrolled but 15 students transferred to another school and 12 of them were absent owing to sickness. Therefore, 421 children in the second school and their parents were sent an invitation to participate in the study. A total of 145 parents from the first and 58 from the second school refused to participate in the study. Fifteen parents from the first school and 19 from the second school were excluded from the study owing to missing data from both parents' questionnaires. In sum, data for 740 children were evaluated in this study ($n$ = 396, 1. school; $n$ = 344, 2. school) (participation rate 75.7%). Three mothers' and 13 fathers' data from the first school and one mother's and 15 fathers' data from the second school could not be obtained owing to divorce or death (the participation rate for mothers was 75.3% and 72.8% for fathers) (Figure I).

Three hundred and eighty-four subjects were calculated for a required sample size benefiting from a statistical formula for descriptive studies with dichotomous variables with the 95% confidence level.[13] Our sample size was 740 children. Power analysis was performed to determine the adequacy of the sample size. For a .05 significance level, the effect size was .28 and the power value was .95.

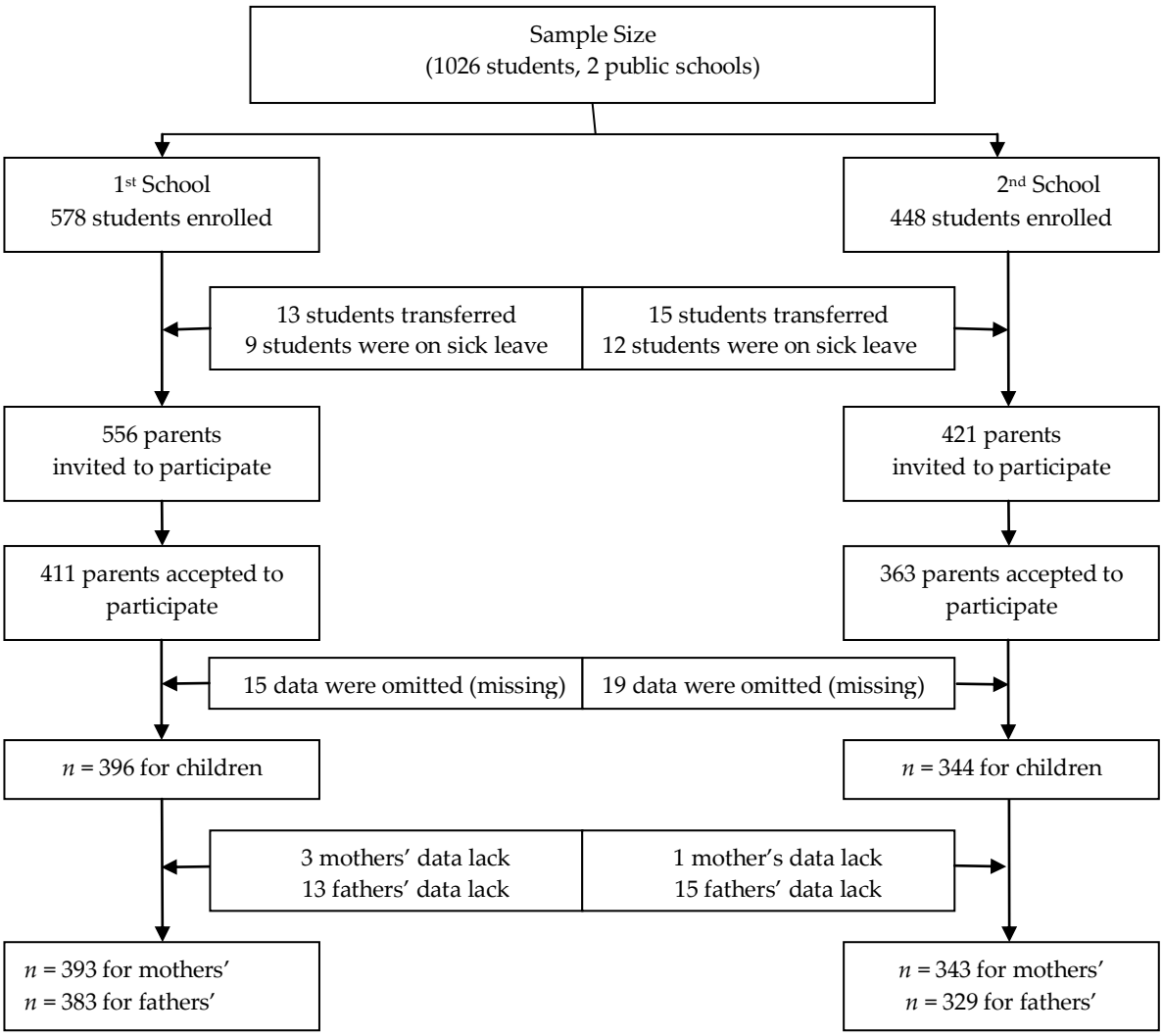


***Figure 1. Origin and Flow of Participants in the Study***

***Data Collection Forms***

The data were collected by two forms. The self-administered questionnaire was the first one for the mother and the father. Parents' questionnaire forms included the same questions to identify their sociodemographic characteristics (age, education level, employment, family structure, family income, weight, height), and their perceptions and concerns about their children's weight status. The question 'How concerned are you about your child's weight?' had four answer options: unconcerned, a little concerned, concerned and very concerned. The other question "How do you perceive your child's weight?" had four answer options: underweight, healthy weight, overweight and obese. Questionnaires were compiled by the researchers based on the literature.[14-16] The second form was to record the child's age, gender, weight and height.

***Data Collection Procedure***

The first questionnaires were pilot-tested beforehand on 10 parents who did not participate in the study to assess the understandability and applicability of the questions. All of the questions were clear and understandable so it was not made any corrections in questionnaire after pilot-testing.

The self-administered questionnaires for parents were sent home in envelopes with the children. A second envelope was included. Envelopes were returned by the children to classroom teachers. Then, envelops were received from teachers by researchers.

Children's weight and height measurement were taken by the researchers. Researchers were constituted written checklists about children's weight and height measurements before the screening. Weight measurements were conducted with subjects in minimal clothing. Weight measurements were assessed with a portable scale and the determined values were rounded to the nearest 0.1 kg. Height measurements were done with a stadiometer when students were standing in an upright position, without their shoes. The obtained values were rounded to the nearest 0.1 cm.

Children's BMIs were calculated as their weight in kilograms divided by the square of their height in metres. Considering age and gender, students' BMIs were assessed according to the percentile curves developed by Neyzi and his colleagues for Turkey.[17] In the BMI percentile curve, it was assumed that BMI values for children of the same age and sex:

1. below the fifth percentile indicated underweight.
2. at or above the fifth and lower than the eighty-fifth percentile indicated normal weight.
3. at or above the eighty-fifth percentile and lower than the ninety-fifth percentile indicated overweight.
4. at or above the ninety-fifth percentile indicated obesity[18]

Parental BMIs were calculated from parents' self-reported body weight and height. According to World Health Organisation; a BMI of less than 18.5 was considered as underweight, between 18.5 to 24.9 as normal weight, 25.0 to 29.9 as overweight and at or greater than 30 as obese.[19]

***Analysis of Data***

Frequency and percentage distributions relating to the data were determined. Cohen's Kappa test was used to analyse the inter-rater agreement. Kappa values over .75 were considered as excellent, .40 to .75 as fair to good, and below .40 as poor.[20] SPSS 15.0 statistical software was used for statistical analysis. A $p$ value of $< .05$ was considered statistically significant. The dependent variables of the study consisted of the children's measured BMIs and parents' accuracy situations of their children's weight status while the independent variables consisted of the defining characteristics of the children and parents (child's age, parents' age, education) and perceptions of parents' regarding to their children's BMIs status?

***Ethical Aspect of the Study***

The study was conducted in accordance with the principles of the Declaration of Helsinki which protects dignity. Written informed consent was obtained from the parents. Students who did not give verbal assent to participate and/or did not have parental permission were excluded from the study. The study was approved by the review board of the Ministry of Education of Turkey.

**Results**

Table I shows the descriptive characteristics of children and parents in schools. Most of the children were between 7 and 9 years old (56.8%) and were female (52.5%). Of the 740 children, 10.1% were overweight, and 10% were obese. Altogether, 33.2% of mothers and 30.2% of fathers were concerned about their children's weight (Table 1).

***Table 1: Characteristics of the Children and Families in Schools***

| Characteristics | *n* (%) | Characteristics | *n* (%) |
|---|---|---|---|
| Child age | *n* = 740 | Mothers' concern* | |
| 7-9 years | 421 (56.8) | Non-concerned | 491 (66.8) |
| 10-12 years | 319 (43.2) | Little concerned | 131 (17.8) |
| Child gender | | Concerned to very concerned | 114 (15.4) |
| Female | 389 (52.5) | Mothers' weight status | |
| Male | 351 (47.5) | Healthy weight | 422 (57.3) |
| Children's weight status | | Overweight and obese | 314 (42.7) |
| Underweight | 59 (7.9) | Father age | *n* = 712 |
| Healty weight | 532 (71.9) | 25-39 years | 377 (52.9) |
| Overweight | 75 (10.2) | 40 years and up | 335 (47.1) |
| Obese | 74 (10.0) | Father education | |
| Family income | | Secondary school | 332 (46.6) |
| Expenses is more | 116 (15.7) | High school | 161 (22.6) |
| Income is equal to expenses | 454 (61.4) | University | 219 (30.8) |
| Income is more | 170 (22.9) | Fathers' concern* | |
| Mother age | *n* = 736 | Non-concerned | 497 (69.8) |
| 25-34 years | 329 (44.7) | Little concerned | 133 (18.6) |
| 35 years and up | 407 (55.3) | Concerned to very concerned | 82 (11.6) |
| Mother education | | Fathers' weight status | |
| Secondary school | 370 (50.3) | Healthy weight | 267 (37.5) |
| High school | 142 (19.3) | Overweight and obese | 445 (62.5) |
| University | 224 (30.4) | | |

** Mothers' and fathers' concern about children's weight.*

Between measured BMI and mothers' perceptions, there was also poor agreement ($p < .05$) (Table 2). Some 18.3% of mothers perceived their healthy-weight children as underweight, 53.3% of mothers of overweight children considered their children to be of healthy weight, and 59.4% of mothers of obese children inaccurately classified their children as healthy or overweight ($\chi^2 = 341.3$; $p = .001$). Only 33.8% of mothers were concerned about their children's weight and 64.9% of mothers classified their children's weight status accurately (Table 2).

***Table 2: Weight Categories by Measured BMI and Mothers' Perception (n = 736)***

| | Measured BMI | | | | | |
|---|---|---|---|---|---|---|
| | Underweight | Healthy weight | Overweight | Obese | Cohen's Kappa | |
| Perception of BMI by Mothers | *n* (%) | *n* (%) | *n* (%) | *n* (%) | Kappa | *p* |
| Underweight | 33 (56.9) | 97 (18.3) | 1 (1.3) | 3 (4.1) | .308 | .001 |
| Healthy weight | 24 (41.3) | 391 (73.9) | 40 (53.3) | 17 (22.9) | | |
| Overweight | 1 (1.8) | 34 (6.4) | 27 (36.0) | 27 (36.5) | | |
| Obese | 0 (.0) | 7 (1.4) | 7 (9.4) | 27 (36.5) | | |

Table 3 shows that there was poor agreement between measured BMI and fathers' perceptions ($p < .05$). Some 56.9% of fathers of overweight children considered their children to be of healthy weight, and 42.6% of fathers of obese children inaccurately classified their children as overweight ($\chi^2 = 330.4$; $p = .001$). Some 34.1% of fathers of overweight and obese children were concerned about their children's weight and 65.3% of fathers classified their children's weight status accurately.

***Table 3: Weight Categories by Measured BMI and Fathers' Perception (n = 712)***

| | Measured BMI | | | | | |
|---|---|---|---|---|---|---|
| | **Underweight** | **Healthy weight** | **Overweight** | **Obese** | **Cohen's Kappa** | |
| Perception of BMI by Fathers | *n* (%) | *n* (%) | *n* (%) | *n* (%) | Kappa | *p* |
| Underweight | 30 (50.9) | 92 (17.9) | 3 (4.1) | 3 (4.4) | .288 | .001 |
| Healthy weight | 29 (49.1) | 390 (76.0) | 41 (56.9) | 17 (25.0) | | |
| Overweight | 0 (.0) | 28 (5.5) | 26 (36.2) | 29 (42.6) | | |
| Obese | 0 (.0) | 3 (.6) | 2 (2.8) | 19 (28.0) | | |

Table 4 shows that mother's education level was associated with mothers' ability to perceive their children's weight status accurately ($p < .05$). According to this result, high school and university graduated mothers were more able to know their children's weight status accurately than secondary school graduated mother. Fathers' accuracy in identifying their children's weight was not associated with child's age, fathers' age and fathers' education.

***Table 4. Predictors of Accuracy in Identifying Children's Weight Status***

| | **Mothers' Accuracy** | | **Fathers' Accuracy** | |
|---|---|---|---|---|
| **Factors** | ***n**** | ***p*** | ***n**** | ***p*** |
| Child age | | | | |
| 7-9 years | 266 (55.6) | .393 | 258 (55.4) | .255 |
| 10-12 years | 212 (44.4) | | 207 (44.6) | |
| Mother age | | | | |
| 25-34 years | 212 (44.3) | .795 | 208 (44.8) | .491 |
| 35 years and up | 266 (55.7) | | 256 (55.2) | |
| Father age | | | | |
| 25-39 years | 242 (52.3) | .683 | 246 (52.9) | .973 |
| 40 years and up | 221 (47.7) | | 219 (47.1) | |
| Mother education | | | | |
| Secondary school | 230 (48.1) | .025† | 227 (48.9) | .217 |
| High school and more | 248 (51.9) | | 237 (51.1) | |
| Father education | | | | |
| Secondary school | 210 (45.3) | .596 | 211 (45.4) | .626 |
| High school and more | 253 (54.7) | | 254 (54.6) | |

**It shows the true knowing number of the children weight status.*
*† Significant at p < .05.*

**Discussion**

Obesity is an important health problem in childhood. Overweight and obesity prevalence in children and adolescence is set to increase worldwide. Overweight in childhood increases the obesity

risk at adolescence and adulthood and has significant impact on both physical and psychological health.[21,22] For this reason, it is thought that taking precautions against childhood obesity could decrease the risks of obesity and health problems during adulthood. In our study, we found that approximately 20% of children were overweight and obese. It is clear that those results are compatible with the literature.[4-6]

Obesity arises from the imbalance between calorie intake and the usage of calories, however, and genetics is one of the factors that affect the aetiology of obesity. In the literature, it is shown that a child has a risk of obesity of 80% if both parents are obese, 50% if only one parent is obese, and 9% if neither parent is obese.[23] In our study, it was determined that approximately half of the mothers and more than half of the fathers were overweight and obese. Similarly to these results, most adults are overweight and obese in a lot of countries.[4] It is difficult to reduce excessive weight once it is gained. Intervention strategies should therefore target children. Prevention may be achieved through a variety of interventions including controlling the environment, physical activity, and diet.[22]

Families' perceptions about their children's weight could affect the health status of children.[11] In this research, about half of the mothers and fathers perceived their overweight children to be of healthy weight and obese children to be overweight. Several studies have been conducted on parental perceptions about children's weight status and results showed that parents do not perceive their children as being overweight or they usually underestimate the weight of their children.[11,14,16,24-26] Our results were similar to literature. It could be that parents' underestimating their children's weight may be due to guilt or denial. Parents often fear labeling of their child and don't want the child to be treated differently because of his or her weight. On the other hand, families' inaccurate perceptions about their children's weight could result in obesity and obesity-related health problems in later life.

Many parents may not be aware that overweight during childhood is harmful or they may think overweight is something that children will grow out of. It may also be that parents see the risks associated with excess weight as being more serious in adolescence and adulthood.[27] This situation, however, could have an adverse effect on children's nutrition style and feeding habits.[23] In our study, roughly half of the parents perceived their children's weight inaccurately and failed to see children as overweight or obese. Parents need to be informed about their child's ideal weight and the risks of obesity in childhood. Studies have shown that parents are unaware of their overweight child's weight status.[15,26] It is thought that if parents know the healthy weight variations and the risks of obesity in childhood, it might reduce the prevalence of child obesity.

Lower levels of maternal education are risk factors for overweight.[14] Maternal education level is defined as an important factor in preventing childhood obesity[10] because children's behaviours in terms of food are shaped by maternal knowledge and perception.[9] In this study, we found that maternal education level affected children's ability to perceive their weight status accurately; children whose mothers' education level was high school or higher perceived their weight status more accurately. Similarly to this study, Maynard et al. (2003) and Baughcum et al. (2000) found that maternal level of education and appropriate maternal perception of overweight were positively correlated with knowledge of children's body weight category.[14,25] For this reason, it is essential to develop healthy behaviours (such as healthy nutrition and physical activity) in children at the beginning of their life. Mothers play a crucial role in developing healthy behaviours. A higher education level seems to help mothers to perceive their child's weight status better and prepare and apply control strategies regarding healthy lifestyles.

The important limitations of this study were that the survey was performed in two public schools in Ankara, Turkey, which might limit the generalizability of its results. Although 75.7% of children, 75.3% of mothers and 72.8% of fathers participated in the study, we had complete data on only 72.3% of parent-child pairs. We do not have any information about non-respondent parents' data. Also, weight and height of parents' were assessed from their written statements. In addition to those limitations, one parent could complete both forms so it could cause similarities about the perceptions of parents.

**Conclusion**

Pediatric nurses have an important role in identifying children at risk of overweight and obesity. For this reason, nurses should assess the weight and height of children to determine the BMIs compatible with their age and sex. Nurses have another important role in informing families about their children's weight status.[28] Pediatric nurses should develop appropriate and effective strategies to help parents recognize their children's actual weight status. So, nurses should educate parents on healthy weight variations based on age and gender. Educating parents to prevent misperceptions about their overweight or obese children could lead to healthy lifestyle behaviours regarding nutrition, physical activity and screen viewing. Parents' involvement in reducing childhood obesity is essential in pediatric weight management. Parents can increase awareness and maintain healthy behaviours by acting as role models for their children.

In conclusion, this study shows that most of the mothers and fathers whose children were overweight and obese have inaccurate perceptions of their child's body weight. Many mothers and fathers do not consider excess weight or obesity in childhood to be a health problem. Level of maternal education affects mothers' perception of weight. It is recommended that pediatric nurses should try to increase parental awareness in terms of preventing obesity and the risks of obesity.

**Contribution of Authors**

Design of Study: E K-T, S A, S S
Data Collection or/and Analysis: E K-T, S A
Preperation of Manuscript: E K-T, S A, S S

**Declaration of interest**

The authors report no conflicts of interest. The authors alone are responsible for the content and writing the paper.

**References**

1. Ogden CL, Carroll MD, Flegal KM. Epidemiologic trends in overweight and obesity. Endocrinol Metab Clin North Am 2003;32(4):741–760.
2. European Commission[Online]. In R. D'Amario, I. Froidmont-Görtz (Eds.), The fight against obesity. Belgium 3-4. Available from: http://ec.europa.eu/research/biosociety/pdf/brochure_nutrition_and_obesity.pdf (2005), (Accessed 2014 Oct 28).
3. He M, Beyhon C. Prevalence of overweight and obesity in school-aged children. Can J Diet Pract Res 2006;67(3):125–130.
4. International Association for the Study of Obesity [Online]. Childhood obesity. Available from: http://www.iaso.org/resources/aboutobesity/child-obesity/, (Accessed 2013 May 12).
5. Oztora S, Hatipoglu S, Barutcugil MB, Salihoglu B, Yildirim R, Sevketoglu E. İlköğretim çağındaki çocuklarda obesite prevalansının belirlenmesi ve risk faktörlerinin araştırılması [Estimating the prevalence of obesity and related risk factors for the primary school children]. Bakırköy Tıp Derg [Med J Bakırkoy] 2006;2(1):11–14.

6. Simsek F, Ulukol B, Berberoglu M, Gulnar SB, Adiyaman P, Ocal G. Ankara'da bir ilköğretim okulu ve lisede obezite sıklığı [Obesity prevalence in a primary school and a high school in Ankara]. Ankara Üniv Tıp Fak Mecm [J Ankara Univ Med Fac] 2005;58(4):163–166.
7. Gonzalez JL, Gilmer L. Obesity prevention in pediatrics: A pilot pediatric resident curriculum intervention on nutrition and obesity education and counseling. J Natl Med Assoc 2006;98(9):1483–1488.
8. Reilly JJ. Descriptive epidemiology and health consequences of childhood obesity. Child Obes 2005;19(3):327–341.
9. Boardman JD, Hummer RA, Padilla Y, Powers D. Low birth weight, social factors, and developmental outcomes among children in the United States. Demograpy 2002;39:353–368.
10. Fertig A, Glomm G, Tchernis R. [Online]. The connection between maternal employment and childhood obesity: Inspecting the mechanism (2005). Available from: http://www.paa2006.princeton.edu/download.aspx (Accessed 2013 June 15).
11. Etelson D, Brand D, Patrick P, Shirali A. Childhood obesity: Do parents recognize this health risk?. Obes Res 2003;11:1362–1368.
12. Lobstein T, Baur LA. Policies to prevent childhood obesity in the European Union. Eur J Public Health 2005;15(6):576–579.
13. Hulley SB, Cummings SR, Browner WS, Grady DG, Newman TB. Designing clinical research – An epidemiologic approach (3th ed.). Philadelphia: Lippincott Williams and Wilkins, 2007; 128-132.
14. Baughcum AE, Chamberlin LA, Deeks CM, Powers SW, Whitaker RC. Maternal perceptions of overweight preschool children. Pediatrics 2000;106(6):1380–1386.
15. Campbell MW, Williams J, Hampton A, Wake M. Maternal concern and perceptions of overweight in Australian preschool-aged children. Med J Aust 2006;184(6):274–277.
16. Hackie M, Bowles CL. Maternal perception of their overweight children. Public Health Nurs 2007;24(6):538–546.
17. Neyzi O, Gunoz H, Furman A, Bundak R, Gokcay G, Darendeliler F, Bas F. Türk çocuklarında vücut ağırlığı, boy uzunluğu, baş çevresi ve vücut kitle indeksi referans değerleri [Weight, height, head circumference and body mass index references for Turkish children]. Çocuk Sağ Hast Derg [J Child Health Illness] 2008;51(1):1–14.
18. Centers for Disease Control and Prevention (CDC) [Online]. Healthy weight: About BMI for children and teens (2011). Available from: http://www.cdc.gov/healthyweight/ assessing/bmi/childrens_bmi/about_childrens_bmi.html (Accessed 2013 July 08).
19. World Health Organization (WHO) [Online]. Obesity and overweight (2005). Available from: http://www.who.int/dietphysicalactivity/publications/facts/obesity/en/ (Accessed 2013 July 07).
20. Fleiss JL. *Statistical* methods for rates and proportions (2nd ed.). New York: John Wiley, 1981; 240-265.
21. Bungum T, Satterwhite M, Jackson AW, Morrow JR. The relationship of body mass index, medical costs, and job absenteeism. Am J Health Behav 2003;27(4):456–462.
22. Dehghan M, Akhtar-Danesh N, Merchant AT. Childhood obesity, prevalence and prevention. Nutr J 2005;4(24):1–8.
23. Gunoz H, Saner G, Demirkol M, Gokcay G, Huner G, Garibagaoglu M. Beslenme ve beslenme bozuklukları [Feeding and feeding disorders]. In O Neyzi, T Ertugrul (Eds.), *Pediatri* [*Pediatrics*] (Issue I, 3th ed.). Ankara: Nobel Tıp Publication, 2002; 167-248.
24. de Hoog ML, Stronks K, van Eijsden M, Gemke RJ, Vrijkotte TG. Ethnic differences in maternal underestimation of offspring's weight: the ABCD study. Int J Obes 2012;36(1):53-60.
25. Maynard LM, Galuska DA, Blanck HM, Serdula MK. Maternal perceptions of weight status of children. Pediatrics 2003;111(5):1226–1231.
26. Tschamler JM, Conn KM, Cook SR, Halterman JS. Underestimation of children's weight status: Views of parents in an urban community. Clin Pediatr 2010;49(5):470–476.
27. Crawford P, Gosliner W, Anderson C, Strode P, Becerra-Jones Y, Samuels S, Carroll AM, Ritchie LD. Counseling Latina mothers of preschool children about weight issues: Suggestions for a new framework. J Am Diet Assoc 2004;104(3):387–394.
28. Toruner EK, Savaser S. A controlled evaluation of a school-based obesity prevention in Turkish school children. J School Nurs 2010;26(6):473–482.