International Journal of Sport Culture and Science
June 2021 : 9(2)
ISSN : 2148-1148
Doi : 10.14486/IntJSCS.2021.639

Physical Activity and Healthy Food Preference in Turkish Preschool Children

Fatma İlker KERKEZ[1], Derya SAKALLI[2]
[1]Muğla Sıtkı Koçman Üniversitesi, Muğla, Türkiye
https://orcid.org/0000-0002-5485-1834
[2] Muğla Sıtkı Koçman Üniversitesi, Muğla, Türkiye
https://orcid.org/0000-0001-9039-9905

Email: fatmakerkez@mu.edu.tr, deryasakallii@gmail.com

Type: Research Article (Received:11.01.2021– Accepted:26.06.2021)

Abstract

Increased inactivity and unhealthy eating habits in children are worrying. It is important to determine food preferences to help children gain healthy eating habits and physical activity preferences to keep them away from inactivity. This study aimed to investigate physical activity and healthy food preferences of 48-60 months old Turkish children by age, gender, and BMI. In this study, a cross-sectional survey method was used. A total of 177 Turkish children (95 boys-82 girls) from three different preschools in Muğla city centre participated in the study. After measuring height and weight of the children, BMI values were calculated. Activity cards containing 12 pictures of energetic and sedentary activities were used to determine the children's physical activity preferences. To determine healthy food preference, different food cards were prepared for breakfast and dinner. Each card contains 20 images of healthy and unhealthy foods. Data were collected through face-to-face interviews. During these interviews, these cards were shown to the children and asked to choose four different foods for breakfast and dinner separately. Data were analysed with descriptive statistics, Kruskal-Wallis and Mann Whitney-U Test. To BMI values, it was found that 5.1% of children were underweight, 67.8% were healthy, 14.7% were overweight, 12.4% were obese. When food preferences were examined, no statistically significant difference was found between healthy food preferences and gender (U:38323.000; p:0.850), BMI (X^2: 1.843; p:0.606), and age (U:2882.000; p:0.850). More research is needed on how children's food preferences are shaped and the factors affecting these preferences.

Keywords: preschool, food, child, preference, health

Introduction

Nutrition is an essential requirement for humans to reach their growth and development potentials, to be protected from diseases, and to lead a high-quality life (Arlı et al., 2017). It is seen as the most important factor affecting growth in the first five years of people's life (Karaağaoğlu & Samur, 2017). Nutritional patterns and food preferences are determined in these years (Black & Hurley, 2007). Children learn what, when, and how much food to eat by experiencing food directly and observing the eating behaviours of others (Birch, Savage & Ventura, 2007).

According to the literature, biological tendencies influence children's food preferences and aversions but they are also alterable (Ventura & Worobey, 2013). Repeated exposure to a certain food facilitate the acceptance of that food. Babies who taste various foods accept new nutrients more easily than those who are fed uniformly. This shows the importance of providing a variety of foods starting from the early period of one's life (Kabaran, 2017).

Food intake above or below normally required levels leads to many problems. One of these problems is obesity. According to the Global Burden of Disease [GBD] report, a total of 107,7 million children were found to be obese in 2015 (GBD, 2017). Mavrovouniotis (2012) states that children today spend 400% less energy than their peers 40 years ago and they are 40% less active compared to children 30 years ago. There is a lot of evidence that obesity and overweight among children are established at an early age and are associated with adverse health consequences (Lindholm, 2019). Therefore, tackling obesity during this period of their lives is very important to reduce life-long risks and to protect health (Lanigan, Tee & Brandreth, 2019). But, even today, only a few countries use standard treatment to prevent overweight and obesity in the preschool years (Ek et al., 2019) and there is need for strategies to reduce obesity in preschool children (Ball, Savu & Kaul, 2019). Another problem seen in this period is malnutrition (Mother Child Education Foundation [ACEV], 2017). It is one of the main causes of death and disability worldwide and it leads to developmental problems (such as being short for their age or weak for their height) in children. Apart from obesity and malnutrition, some of the eating disorders observed in children are picky eating, neophobia, dislike of certain food groups, and not eating enough (Cooke, Higgins & McCrann, 2017). Picky eating behaviours have the potential to have an adverse effect on nutrient consumption, diet quality, normal growth, and future health outcomes in children (Kermen & Aktaç, 2018).

Food preference, which is the main determinant of eating behaviours in children (Guthrie, Rapoport & Wardle, 2000) plays an important role in determining the eating patterns, eating habits, and diet quality that can continue during adulthood (Faith, 2010). Getting a child to adopt healthy eating habits in preschool period can provide the right and balanced nutrition throughout the life of that child (Arlı et al., 2017). Healthy eating during this period reduces the risks of obesity, cardiovascular diseases, cancer, and other chronic diseases, and also helps the children gain healthy eating habits (Karaağaoğlu & Samur, 2017). Children should receive nutritional education in order to correct their wrong eating habits like skipping breakfast and to choose healthy foods for meals (Kabaran & Mercanlıgil, 2013). Learning prevention is more important than coping with the consequences of epidemics and prevention depends on the implementation of health education programs and healthy habits in life (Minossi & Pellanda, 2015). A nutrition education program increases nutritional knowledge scores of preschool children and positively changes their food preferences (Başkale & Bahar, 2011). Sigman-Grant et al., (2014) state that after education, three to five-year-old preschool children have increased level of recognition of healthy foods and their food preferences change. For this reason, healthy eating education should start during the preschool period as behaviours

form during this period. Children who receive proper nutrition education with right methods in this period will later become healthier adults (Akder, Meseri & Çakıroğlu, 2018).

In addition to the increasingly sedentary and screen-oriented lifestyle, unhealthy eating habits in children are worrying. Given that weight gain happens when the energy consumption exceeds its use, it is vital to understand the source of food preferences in order to contribute to weight control (Benton, 2004). It is necessary to determine children's food choices to prevent obesity and to bring healthy eating habits (Kabaran & Mercanlıgil, 2013). Furthermore, factors that determine nutritional behaviour should be understood to promote healthy nutrition (Brug et al., 2008). According to Holub and Musher-Eizenman (2010), although eating behaviour begins to develop in early childhood, there is little information on nutritional traits of preschool children and studies on food intake among preschool children are relatively rare (Parizkova, 2009). Therefore, this study aims to investigate the healthy food preferences of Turkish preschool (48 to 60-month-old) children.

Method

Research design: This study used cross-sectional survey method, one of the descriptive research methods. Descriptive research methods are studies made to collect data to determine specific characteristics of a group (Büyüköztürk et al., 2016). Cross-sectional studies take place at a time point or in a short period of time. These studies provide a 'snapshot' of the result and its associated properties at a given time (Levin, 2006).

Research Sample: The population of the study consists of 4 to 5- years-old children attending preschool in Muğla city centre. Convenience sampling method was used in the study. The purpose of this method is to include everyone who wants to sample. The participant discovery process continues until the specified sample size is reached (Ural & Kılıç, 2006). Families of children were sent parents informed consent form and only children whose parents gave consent were included in the study. A total of 177 Turkish children (95 boys, 82 girls) aged between 48 to 60-months (56.14±5.6 months) from three different preschools in Muğla city centre participated in the study after their parents' permission obtained. Information about the research sample is given in Table 1.

Table 1. Characteristics of the Participants

School	Month		Total	Gender	
	48	60		Boy	Girl
A	18	31	49	23	26
B	4	26	30	17	13
C	35	63	98	55	43
Total	57	120	177	95	82

Research Instruments and Procedures

Height – Weight – BMI measurements: Researchers measured children's height and weight one by one under the supervision of a teacher in an area designated by the school principal. During the measurements, children were brought to a normal anatomical position. For measuring height and weight, researchers used a standard measuring rod and a portable scale. Weight measurement was done in light clothing and without shoes. For height measurement, researchers asked the children to rest their back and heels against a wall. Body mass index (BMI) was calculated using the formula (kg) / (m^2). For calculating children's BMI weight categories, z score cut-off values (underweight: < -2SD, overweight :> + 1SD, fat (obese): > + 2SD) were used for each age according to the World Health Organization (WHO, 2007). BMI weight categories of children are presented in Table 2.

Table 2. BMI Weight Categories

	Underweight		Healthy		Overweight		Obese		Total
	Girl	Boy	Girl	Boy	Girl	Boy	Girl	Boy	
N (%)	3 (1.7)	6 (3.4)	57 (32.2)	63 (35.6)	13 (7.3)	13 (7.3)	9 (5.1)	13 (7.3)	177
Total	9 (5.1)		120 (67.8)		26 (14.7)		22 (12.4)		%100

Activity Card: The activity preferences of the children were determined through the activity card, which was inspired by the pictures used in the study of Yörüsün et al., (2017). There are 8 energetic (to play ball, ride a bicycle, jump rope, dance, swim, run, do sport, go to park) and 4 inactive (to read book, play computer games, sleep, watch TV) activity pictures on the card.

Food Preference Cards: To determine healthy food preferences of children, researchers prepared food cards, each with 20 pictures of healthy and unhealthy foods for breakfast and dinner. The researchers were inspired by the visuals used in the study of Yörüsün et al. (2017). This method is used by some studies on nutritional knowledge and preferences of children in national (Kerkez, 2018; Yörüsün et al., 2017) and international literature (Zeinstra et al., 2007; Slaughter & Ting, 2010; Carraway-Stage et al., 2014; Sigman- Grant et al., 2014). Healthy and unhealthy foods for breakfast and dinner are presented in Table 3.

Table 3. Healthy and Unhealthy Food for Breakfast and Dinner

Breakfast		**Dinner**	
Healthy	**Unhealthy**	**Healthy**	**Unhealthy**
Sausage egg skillet	Cornflakes	Fish	Hamburger
Boiled egg	Turkish bagels	Ayran	Spaghetti
Cucumber	Tea	Grilled chicken	Fried potatoes
Orange juice	French fries	Green beans	Pizza
Cheese	Bread with chocolate	Yoghurt	Baklava
Olives	Turkish pancake	Soup	Rice pilaf
Honey	Bread	Grilled meatballs	Cola
Milk	Pastry	Chickpeas with meat	Bulgur pilaf
Butter	Turkish fried bread	Fruit	Stuffed green pepper
Tomato	Cake	Kebab	Split aubergines with meat filling

For breakfast, if a child chose the healthy foods (egg, milk, cucumber, olives, etc.) 10 points were given for each food that they chose; but if they chose unhealthy foods (bread with chocolate, cake, Turkish fried bread) they would get no points. For dinner, if they chose healthy foods (buttermilk, fish, vegetable dish, yoghurt etc.) 10 points were given for each food; but if they chose unhealthy ones (hamburger, baklava, pizza, etc.) no point was given. The total score obtained from the breakfast or dinner food cards ranges between 0 and 40 points. The healthy food preference score is obtained from the sum of the scores from the breakfast and dinner cards. Healthy food preference score ranges from 0 to 80 points.

After the approval of the Ethics Committee and the District National Education Directorate, the researchers followed the below procedures in order. First, they visited preschools and met their principals to provide information about the research. After that, they sent informed consent forms for parents and descriptive forms to the families through classroom teachers in these preschools. Then, they initiated the data collection phase.

The researchers measured height and weight of each student participating the research. After that, they showed the breakfast and the dinner food cards to the children in order and asked them to choose four foods that they wanted to eat. During the selection, the children were asked to tell what the food was and whether or not they knew that food. If the children misunderstood what the food was, they would be told what the food actually was, and that

they were allowed to make another choice if they wanted to. Interviews with each child lasted an average of 10 minutes.

For data analysis, due to the non-normal distribution of data researchers used descriptive statistics tests, Kruskal Wallis Test, and Mann-Whitney U Test.

Results

When the physical activity preferences of children were examined, it was determined that their first preference was energetic activities with 83.1%. It was found that the most preferred energetic physical activities were swimming (32.2%) and cycling (15.8%). On the other hand, the most preferred sedentary activities were found to be sleeping (5.6%) and watching TV (4.5%).

Table 4. U-Test Results of Healthy Food Preference Scores According to Gender Variable

Gender	n	Mean (sd)	Mean Rank	Sum of Ranks	U	p
Boys	95	42.52 (15.5)	88.34	8392.00	38323.000	0.850
Girls	82	42.56 (14.3)	89.77	7361.00		

As can be seen in the Table 4, as a result of the non-parametric Mann Whitney-U test performed to determine the significance of the difference between gender and healthy food preference scores, there was no significant difference between gender and healthy food preference (U: 38323.000, p>0.05).

Table 5. Healthy Food Preference Score Difference According to BMI Weight Categories

Variable	BMI Groups	n	Mean (sd)	Mean Rank	X^2	sd	p
Healthy Food Preference Score	Underweight	9	36.60 (13.2)	70.50	1.843	3	0.606
	Healthy	120	43.41 (14.9)	91.66			
	Owerweight	26	41.92 (15.2)	87.83			
	Obese	22	40.90 (15.4)	83.43			

Table 5 includes the results of Non-Parametric Kruskal Wallis-H Test, which was applied to define the significance of the difference whether healthy food preference scores and BMI weight categories. According to this, a significant difference is not found between healthy food preference scores and BMI weight categories (X^2: 1.843, sd:3, p>0.05).

Table 6. U-Test Results of Healthy Food Preference Scores According to Age Variable

Age	n	Mean (sd)	Mean Rank	Sum of Ranks	U	p
48 months	57	40.0 (15.0)	79.56	4535.00	2882.000	0.850
60 months	120	43.7 (14.8)	93.48	11218.00		

The nonparametric Mann Whitney-U test was used to determine the significance of the difference between healthy food preference scores and age. To Table 6, there is no significant difference between healthy food preference scores and age (U: 2882.000, p>0,05).

Discussion and Conclusion

The purpose of the study was to investigate the physical activity and healthy food preferences of 48 to 60 month old Turkish children and to determine the difference of food preferences according to age, gender, and BMI.

Studies examining the relationship between gender and healthy food preference have found different results. Lytle et al. (2000) found that trends in food consumption and eating habits over time were extremely consistent between boys and girls. Perez-Rodrigo et al. (2003) reported that boys and girls had a similar nutritional pattern in their study, which examined fruit and vegetable preference score by gender in children and young people. De Lira-García,

Bacardí-Gascón, and Jiménez-Cruz (2012) observed no difference in food preferences according to gender. Similarly, Wardle et al. (2001) stated that four to five-year-old girls liked vegetables more than boys, but there was no gender difference in the meat and fish, dessert, or fruit groups. As stated in Table 4, this study found no statistically significant difference in healthy food preferences by gender ($p > 0.05$). Contrary to these findings, Cooke and Wardle (2005) revealed that boys preferred fatty and sugary foods, meat, processed meat products, and eggs, whereas girls preferred fruits and vegetables. In other words, they found that compared to boys, girls prefer healthier foods. Also, Hare-Bruun et al. (2011) found that 8 to 10 year-old boys generally prefer less healthy foods than girls in this age group. In another study, Aslam and Durrani, (2018) revealed that both adolescent boys and girls prefer fast food compared to different food groups. In addition they found a statistically significant difference in favor of men in terms of fast food preferences. Caine-Bish and Scheule (2009) reported that food preferences differed between genders. According to them, girls preferred fruits and vegetables whereas boys preferred meat, fish, and poultry dishes. A study conducted with children aged 6 to 12 by Kimura et al., (2014) found significant gender differences. The indices reflecting food interest or fat preference were significantly higher in boys than girls. In their study with adolescents, Kabaran and Mercanlıgil (2013) determined that girls gave higher scores to vegetables than boys who gave higher scores to sausage, pastrami, doner/iskender kebab, lahmacun, soda drinks, and energy drinks than girls.

As seen in Table 5, this study found no statistically significant difference between the healthy food preference scores of children according to BMI weight categories ($p > 0.05$). According to Worobey et al. (2005), the recommended daily amount of energy for a four-year old girl with low activity is 1310 calories; for an active five-year-old boy it is 1658 calories. In this case, overweight and obese children in the sample consume more energy than they need. The lack of difference in food preferences according to BMI weight categories shows that children can distinguish between healthy and unhealthy foods. Studies examining the relationship between BMI and healthy food preference and between gender and healthy food preference reveal different results. Similarly, to this study, a study conducted by Gregory, Paxton, and Brozovic (2010) found no correlation between a child's BMI and eating behaviour. A study conducted with children aged two to five found no significant relationship between BMI and total energy intake from beverages (LaRowe, Moeller & Adams, 2007). Also, Byrne et al., (2018) found no correlation between food intake and BMI z score. On the other hand, intelligent selection of food and nutrient components and appropriate food intake patterns are said to be important for the prevention of childhood obesity. To this, vitamin B and drinks sweetened with sugar increase the risk of obesity (Huang & Qi, 2015). Guerrero et al., (2016) emphasized that consumption of more soda and fast food was associated with higher average BMI growth. LaRowe et al., (2007) found that dietary quality was different in terms of the beverage drinking habits of children aged between two and five and 6 and 11, but that BMI was significantly associated with beverage drinking habits of children aged between 6 and 11. Another study found eating behaviours of children to be related to BMI z score (Vollmer et al., 2015). De Lira-García et al., (2012) found that children at high risk of overweight and obesity preferred foods high in sugar and fat as well as energy-dense foods. These differences among the findings obtained from various studies are thought to be due to the characteristics of the groups whose data are collected. In this study, the administrators of the schools that participated in the research stated that children in their schools were constantly informed about healthy nutrition. This nutrition education could be the reason why there is no statistically significant difference between genders and BMI weight categories in healthy food preference.

To table 6, the study found no statistically significant result in healthy food preferences according to age groups ($p > 0.05$). Zarnowiecki et al., (2011) reported that five to six-year-old children know healthy food correctly and that this could be measured. Holub and Musher Eizenman (2010) reported that there was a positive relationship between the age of children and the number of correct answers they gave to food groups in the study, which they conducted on nutritional information according to age and gender in three to six-year-old children. Similarly, Author (2018) noted that nutritional recognition levels were generally high in 4 to 5-years old children and the nutritional recognition score increased with age. Similar to the results of current study, Kimura et al., (2014) stated that there was no difference between food preference and age in seven to nine and 10 to 12-years-old age groups of children. However, unlike these findings another study found that fast food and sweet consumption (sweetened beverages, fast foods, salty snacks, and sweets) was positively associated with the age of children (Nasreddine et al., 2019). Cooke and Wardle (2005) reported that there were age-related differences for food preferences in the fatty/sugary, fruit, fish, and dairy categories. eat. The lack of a statistically significant difference in this study may be due to the fact that the children were asked which food they preferred to eat, not because the children did not know whether the food was healthy or not.

The study has some limitations as it has not examined the relationship of children's healthy food preferences with factors such as parents' nutritional habits or infant feeding methods. There is need for further studies to determine the factors affecting children's food preferences. Also, more research involving family and preschool institutions should be conducted to shape the nutritional habits of preschool children in a healthy way. It is very important to provide education on healthy eating habits to families and preschool institutions in preschool period. The administrators of the schools participating this research stated that children were constantly given information about healthy nutrition. However, since children in this age group cannot easily reach food on their own, whether overweight and obese children consume excess energy at home or at school can be checked.

*This article is orally presented at the II. World Congress of Sport Sciences Researches (WCSSR-2019)

REFERENCES

Akder RN, Meseri R, Çakıroğlu FP (2018). Nutrition education for school-aged children. Journal of Ankara Health Sciences 7(2): 1-10.

Arlı M, Şanlıer N, Küçükkömürler S, Yaman M (2017). Anne ve çocuk beslenmesi: Pegem Atıf İndeksi.

Aslam I, Durrani AM (2018). A cross sectional study on food preferences among adolescents in schools of Aligarh city. International Journal of Applied Home Science 5(4): 805-810.

Ball GD, Savu A, Kaul P (2019). Changes in the prevalence of overweight, obesity, and severe obesity between 2010 and 2017 in preschoolers: A population -based study. Pediatric Obesity 14(11): e12561.

Başkale H, Bahar Z (2011). Outcomes of nutrition knowledge and healthy food choices in 5- to 6-year-old children who received a nutrition intervention based on Piaget's theory. Journal for Specialists in Pediatric Nursing: JSPN 16(4): 263-279.

Benton D (2004). Role of parents in the determination of the food preferences of children and the development of obesity. International Journal of Obesity 28(7): 858-869.

Birch L, Savage JS, Ventura A (2007). Influences on the development of children's eating behaviours: from infancy to adolescence. Can J Diet Pract Res 68: S1-S56.

Black MM, Hurley KM (2007). Helping children develop healthy eating habits. In: Tremblay RE, Barr RG, Peters RDeV and Boivin M (eds) Encyclopedia on Early Childhood Development. Montreal, Quebec: Centre of Excellence for Early Childhood Development; pp.1-10

Brug J, Kremers SP, Van Lenthe F, Ball K, Crawford D (2008). Environmental determinants of healthy eating: in need of theory and evidence. Proceedings of the Nutrition Society 67(3): 307-316.

Büyüköztürk Ş, Çakmak EK, Akgün ÖE, Karadeniz Ş, Demirel F (2016). Bilimsel araştırma yöntemleri: Pegem Akademi.

Byrne R, Zhou Y, Perry R, Mauch C, Magarey A (2018). Beverage intake of Australian children and relationship with intake of fruit, vegetables, milk and body weight at 2, 3.7 and 5 years of age. Nutrition & Dietetics 75(2): 159-166.

Caine-Bish NL, Scheule B (2009). Gender differences in food preferences of school -aged children and adolescents. Journal of School Health 79(11): 532-540.

Carraway-Stage V, Spangler H, Borges M, Goodell LS (2014). Evaluation of a pictorial method to assess liking of familiar fruits and vegetables among preschool children. Appetite 75: 11-20.

Cooke L, Higgins C, McCrann Ú (2017). Managing common feeding difficulties in toddlers and pre-school children. Paediatrics and Child Health 27(8): 366-370.

Cooke LJ, Wardle J (2005). Age and gender differences in children's food preferences. British Journal of Nutrition 93(5): 741-746.

De Lira-García C, Bacardí-Gascón M, Jiménez-Cruz A (2012). Preferences of healthy and unhealthy foods among 3 to 4 year old children in Mexico. Asia Pacific Journal of Clinical Nutrition 21(1): 57-63.

Ek A, Nyström CD, Chirita-Emandi A, Tur JA, Nordin K, Bouzas C ..., Saez M (2019). A randomized controlled trial for overweight and obesity in preschoolers: the More and Less Europe study-an intervention within the STOP project. BMC Public Health 19(1): 945.

Faith M (2010). Development of child taste and food preferences. The role of exposure. In Agras WS (eds) The Oxford Handbook of Eating Disorders. Oxford University Press, pp.137-147.

Global Burden of Disease (GBD). 2015 Obesity Collaborators (2017) Health effects of overweight and obesity in 195 countries over 25 years. New England Journal of Medicine 377(1): 13-27.

Gregory JE, Paxton SJ, Brozovic AM (2010). Maternal feeding practices, child eating behaviour and body mass index in preschool-aged children: a prospective analysis. International Journal of Behavioral Nutrition and Physical Activity 7(1): 55.

Guerrero AD, Mao C, Fuller B, Bridges M, Franke T, Kuo AA (2016). Racial and ethnic disparities in early childhood obesity: growth trajectories in body mass index. Journal of Racial and Ethnic Health Disparities 3(1): 129-137.

Guthrie CA, Rapoport L, Wardle J (2000). Young children's food preferences: a comparison of three modalities of food stimuli. Appetite 35(1): 73-77.

Hare-Bruun H, Nielsen BM, Kristensen PL, Møller NC, Togo P, Heitmann BL (2011). Television viewing, food preferences, and food habits among children: a prospective epidemiological study. BMC Public Health 11(1): 311.

Huang JY, Qi SJ (2015). Childhood obesity and food intake. World Journal of Pediatrics 11(2): 101-107.

Kabaran S (2017). How can Early Life Flavor Experiences Affect Food Preferences? Journal of Current Pediatrics 15(1): 38-46.

Kabaran S, Mercanlıgil SM (2013). Assessment of the Children's Nutrition Habits, Food Preferences and Obesity Status. Journal of Nutrition and Dietetics 41(2): 115-123.

Karaağaoğlu N, Samur GE (2017). Anne ve çocuk beslenmesi: Pegem Atıf İndeksi.

Kerkez, Fİ (2018). 4-5 Yaş Çocukların Sağlıklı Besin Bilgisinin İncelenmesi. e-Uluslararası Eğitim Araştırmaları Dergisi, 9(3), 47-59.

Kermen S, Aktaç Ş (2018). Picky Eating and Risk Factors in Children. The Journal of Current Pediatrics16(3): 85-102.

Kimura S, Endo Y, Minamimae K, Kanzaki S, Hanaki K (2014). Gender differences in childhood food preference: evaluation using a subjective picture choice method. Pediatrics International 56(3): 389-394.

Lanigan J, Tee L, Brandreth R (2019). Childhood obesity. Medicine 47(3): 190-194.

LaRowe TL, Moeller SM, Adams AK (2007). Beverage patterns, diet quality, and body mass index of US preschool and school-aged children. Journal of the American Dietetic Association 107(7): 1124-1133.

Levin KA (2006). Study design III: Cross-sectional studies. Evidence-Based Dentistry 7(1): 24- 25.

Lindholm A (2019). Overweight and Obesity in Preschool Children: Early Risk Factors and Early Identification PhD Thesis. Halmstad University, Halmstad.

Lytle LA, Seifert S, Greenstein J, McGovern P (2000). How do children's eating patterns and food choices change over time? Results from a cohort study. American Journal of Health Promotion 14(4): 222-228.

Mavrovouniotis F (2012). Inactivity in childhood and adolescence: a modern lifestyle associated with adverse health consequences. Sport Science Review 21(3-4): 75-99.

Minossi V, Pellanda LC (2015). The "Happy Heart" educational program for changes in health habits in children and their families: protocol for a randomized clinical trial. BMC Pediatrics 15(1): 1-10.

Mother Child Education Foundation (ACEV) (2017). Status of children aged 0-6 in Turkey, Retrieved from https://acev.org/wp-content/uploads/2017/11/Ilk6YilBilgiNotu.pdf

Nasreddine L, Shatila H, Itani L, Hwalla N, Jomaa L, Naja F (2019). A traditional dietary pattern is associated with lower odds of overweight and obesity among preschool children in Lebanon: A cross-sectional study. European Journal of Nutrition 58(1): 91-102.

Parizkova J (2009). Nutrition, physical activity, and health in early life. CRC Press.

Perez-Rodrigo C, Ribas L, Serra-Majem LL, Aranceta J (2003). Food preferences of Spanish children and young people: the enKid study. European Journal of Clinical Nutrition 57(1): 45-48.

Shin NY, Shin MS (2008). Body dissatisfaction, self-esteem, and depression in obese Korean children. The Journal of Pediatrics 152(4): 502-506.

Sigman-Grant M, Byington TA, Lindsay AR, Lu M, Mobley AR, Fitzgerald N, Hildebrand D (2014). Preschoolers can distinguish between healthy and unhealthy foods: the all 4 kids study. Journal of Nutrition Education and Behavior 46(2): 121-127.

Slaughter V, Ting C (2010). Development of ideas about food and nutrition from preschool to university. Appetite 55(3): 556-564.

Ural A, Kılıç İ (2006). Bilimsel araştırma süreci ve SPSS ile veri analizi: SPSS 10.0-12.0 for windows. Detay yayıncılık, Ankara.

Ventura AK, Worobey J (2013). Early influences on the development of food preferences. Current Biology 23(9): 401-408.

Vollmer RL, Adamsons K, Foster JS, Mobley AR (2015). Association of fathers' feeding practices and feeding style on preschool age children's diet quality, eating behavior and body mass index. Appetite 89: 274-281.

Wardle J, Sanderson S, Gibson EL, Rapoport L (2001). Factor-analytic structure of food preferences in four-year-old children in the UK. Appetite 37(3): 217-223.

World Health Organization (WHO) (2007). Global Database on Body Mass Index. http://www.who.int/growthref/who2007_bmi_for_age/en/

Worobey J, Worobey HS, Adler AL (2005). Diet, activity and BMI in preschool-aged children: differences across settings. Ecology of Food and Nutrition 44(6): 455-466.

Yörüsün TÖ, Koçyiğit E, İçer MA, Bozkurt O, Köksal E (2017). Healthy food and activity choice of preschool children and body weight. Journal of Gazi University Health Sciences Institute 4(3): 19-26.

Zarnowiecki D, Dollman J, Sinn N (2011). A tool for assessing healthy food knowledge in 5–6-year-old Australian children. Public Health Nutrition 14(7): 1177-1183.

Zeinstra GG, Koelen MA, Kok FJ, Dae Graaf C (2007). Cognitive development and children's perceptions of fruit and vegetables; a qualitative study. International Journal of Behavioral Nutrition and Physical Activity 4(1): 30.