



T.C. YEDITEPE UNIVERSITY

INSTITUTE OF HEALTH SCIENCES

DEPARTMENT OF NUTRITION AND DIETETICS

**THE EFFECTS OF MATERNAL AND OTHER
OBESITY RELATED FACTORS ON BODY MASS
INDEX AMONG 2-6 YEARS OLD PRIVATE
KINDERGARTEN PRESCHOOLERS**

MASTER THESIS

SEDEF AYDIN

İstanbul, 2021



T.C. YEDITEPE UNIVERSITY

INSTITUTE OF HEALTH SCIENCES

DEPARTMENT OF NUTRITION AND DIETETICS

**THE EFFECTS OF MATERNAL AND OTHER
OBESITY RELATED FACTORS ON BODY MASS
INDEX AMONG 2-6 YEARS OLD PRIVATE
KINDERGARTEN PRESCHOOLERS**

MASTER THESIS

SEDEF AYDIN

SUPERVISOR

Assist. Prof. Dr. BİNNUR OKAN BAKIR, PhD.

İstanbul, 2021

THESIS APPROVAL FORM

Institute : Yeditepe University Institute of Health Sciences
Programme : Nutrition and Dietetics
Title of the Thesis : The effects of maternal and other obesity related factors on body mass index among 2-6 years old private kindergarten preschoolers
Owner of the Thesis : Sedef AYDIN
Examination Date : 09.02.2021

This study have approved as a Master Thesis in regard to content and quality by the Jury.

	Title, Name-Surname (Institution)
Chair of the Jury:	Assist. Prof. Dr. Elif GÜNALAN (İstanbul Sağlık ve Teknoloji University)
Supervisor:	Assist. Prof. Dr. BİNNUR OKAN BAKIR (Yeditepe University)
Member/Examiner:	Assist. Prof. Dr. İrem KAYA CEBİOĞLU (Yeditepe University)

APPROVAL

This thesis has been deemed by the jury in accordance with the relevant articles of Yeditepe University Graduate Education and Examinations Regulation and has been approved by Administrative Board of Institute with decision dated 01.03.2021 and numbered 2021/02-09

Prof. Dr. Bayram YILMAZ
Director of Institute of Health Sciences

DECLARATION

I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which has been accepted for the award of any other degree except where due acknowledgment has been made in the text.

Date

01.03.2021

Signature

Sedef AYDIN



ACKNOWLEDGEMENTS

Despite all the negativities, have experienced from the beginning to the last stage of my thesis work, who guided with her knowledge and did not refrain from her support under any circumstances to my precious supervisor Assist. Prof. Dr. Binnur OKAN BAKIR,

To the valuable Çilek Ağacı Anaokulu, Çilek Ağacı Göztepe Anaokulu, Mavi Gezegen Anaokulu and YÖM Göztepe Anaokulu voluntarily contributed and helped me to work, and also to the principal Ceren ŞAHİN KELEŞ,

To my dear workmates and Registered Dietitian Zehra BORA KARA who motivate me with their beliefs,

And most importantly, to my dear father İrfan AYDIN, my dear mother Sevcan AYDIN and my lovely sister Sena AYDIN, who trusts me in all circumstances and stands behind me,

I would like to express my sincere thanks.

Sedef AYDIN

TABLE OF CONTENTS

THESIS APPROVAL FORM	v
DECLARATION	vv
ACKNOWLEDGEMENTS	iv
TABLE of CONTENTS	v
LIST of TABLES	vi
ABBREVIATIONS	viii
ABSTRACT	v
ÖZET	x
1. INTRODUCTION and PURPOSE	1
2. LITERATURE REVIEW	3
2.1. Early Childhood Period	3
2.2. Nutrition	4
2.3. Nutrition-Related Problems	5
2.3.1. Energy Balance	5
2.3.2. Malnutrition	5
2.3.3. Obesity	6
2.3.3.1. Diagnosis of Obesity	6
2.3.3.2. Development of Obesity	7
2.4. Parental Effects	8
2.5. Maternal Factors	9
2.5.1. Perinatal Factors	9
2.5.2. Breastfeeding	10
2.5.3. Formula Feeding	10
2.5.4. Complementary Feeding	11
2.5.5. Employment Status of Mothers	11
2.5.6. Preparing Meals at Home	11
2.6. Physically Active	12
2.7. Screen Time	13
2.8. Sleep Pattern	14
2.9. Stress	14
3. MATERIALS AND METHODS	15

3.1. Participants.....	15
3.2. Data Collection	16
3.2.1. Anthropometric Measurements.....	16
3.2.2. Data Collection	16
3.2.3. Child Feeding Questionnaire	17
3.2.4. Data Analysis Method	18
4. RESULTS	19
5. DISCUSSION AND CONCLUSION	28
6. REFERENCES	40
7. APPENDIX.....	53
7.1. Preliminary Petition Form	53
7.2. Informed Consent Form.....	57
7.3. Ethical Approval	58
7.4. Governorship Approval	59
7.5. The Data Collection (Survey Part 1)	60
7.6. Child Feeding Questionnaire (Survey Part 2)	61
7.7. Permission.....	64
7.8. Curriculum Vitae	65

LIST OF TABLES

Table 4.1. General Characteristics	21
Table 4.2. Descriptive Information on Snacks Answered by Mothers and Preferred by Children While Watching TV	22
Table 4.3. Relationship Analysis of According to Sex of the Child and child BMI Groups.....	22
Table 4.4. Correlations Between Child's BMI Percentile and Maternal BMI, Paternal BMI, Conception Age, Birth Weight.....	23
Table 4.5. The relationship Between Child BMI Percentile Value and Children's Duration of Being Physically Active, Daily Sleep Time, Daily Duration for TV Watching, Snacking While Watching TV	25
Table 4.6. Comparison of CFQ Sub-dimension Scores According to Child BMI Groups	27

ABBREVIATIONS

$\bar{X}$	Mean
BMI	Body Mass Index
CDC	Centers for Disease Control and Prevention
CFQ	Child Feeding Questionnaire
cm	Centimeter
CVD	Cardiovascular Disease
HT	Hypertension
IQ	Intelligence Quotient
IR	Insulin Resistance
kg	Kilogram
Max	Maximum
Min	Minimum
NAFLD	Non-Alcoholic Fatty Liver
OSA	Obstructive Sleep Apnea
S.D.	Standard Deviation
T2DM	Type 2 Diabetes Mellitus
TBSA	Turkey Nutrition and Health Survey
TUBER	Turkey Nutrition Guide
TV	Television
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization

ABSTRACT

Aydın, S. (2021). The Effects of Maternal and Other Obesity Related Factors on Body Mass Index Among 2-6 Years Old Private Kindergarten Preschoolers. Yeditepe University, Institute of Health Science, Department of Nutrition and Dietetics, Master Thesis, Istanbul.

Childhood obesity has become an increasingly important global problem. It is associated with some factors and if these factors can be intervened, its prevalence and incidence may be decreased. In preschool-age children, especially mothers are the role models of their children and responsible from their nutrition. Maternal feeding practices and other parent-controlled factors associated with obesity may have an impact on the child's development of obesity.

This study aimed to examine whether maternal factors including breastfeeding, employment status, cooking at home and, other factors related to childhood obesity such as physical activity, stress factor and watching television affect the body mass index (BMI) percentile of preschool children, and to examine mothers' child feeding practices. 193 preschoolers, including girls (n=106) and boys (n=87) from four private kindergartens in Istanbul, and their mothers participated in the study. According to the results, there was a weak, positive relationship between maternal BMI and child's BMI percentile ($r=0.263$, $p<0.05$). There was a significant relationship between child's BMI percentile and daily TV watching time ($p<0.05$). There was a significant relationship between child's BMI percentile and the mother's thoughts if their children has excessive weight ($p<0.05$). Perceived child weight mean score of children with overweight BMI is significantly higher than the mean score of children with normal BMI ($p<0.05$).

Mothers are effective on nutrition and weight of their children. Some child feeding practices and other factors also affect the BMI percentile of preschool children. Future studies can be conducted among mothers on feeding practices and how much they prefer which food groups.

Keywords: Body Mass Index, Childhood Obesity, Obesity Related Factors, Maternal Factors, Child Feeding Practices.

ÖZET

Aydın, S. (2021). Özel Anaokuluna Giden 2-6 Yaş Arası Çocukların Annelerine Ait Faktörlerin ve Obezite İle İlişkili Diğer Faktörlerin Çocukların Beden Kütle İndeksi Üzerine Etkisi. Yeditepe Üniversitesi, Sağlık Bilimleri Enstitüsü, Beslenme ve Diyetetik Anabilim Dalı, Master Tezi, İstanbul.

Çocukluk çağı obezitesi gittikçe önem kazanan küresel bir problem haline gelmiştir. Çocukluk çağı obezitesi bazı faktörlerle ilişkilendirilmektedir ve bu faktörlere müdahale edildiğinde prevalans ve insidansının azaltılabileceği düşünülmektedir. Anaokulu çağı çocuklarında özellikle anneler çocuklarının rol modelidir ve çocukların beslenmesinden sorumlu kişilerdir. Annenin besleme uygulamaları ve obezite ile ilişkili ebeveyne ait diğer faktörler çocuğun obezite gelişimi üzerinde etkili olabilir.

Bu çalışma emzirme, çalışma durumu, evde yemek pişirme gibi anneye ait faktörler ve fiziksel aktivite, stres faktörü, televizyon izleme gibi çocukluk çağı obezitesi ile ilişkili diğer faktörlerin anaokulu çağı çocuklarının beden kütle indeksi (BKI) persentili üzerinde etkili olup olmadığını incelemek ve ayrıca annelerin çocuk besleme uygulamalarını incelemek amacıyla yapılmıştır. Çalışmaya İstanbul'da özel 4 anaokulundan kız (n=106) ve erkek (n=87) olmak üzere toplamda 193 öğrenci ve anneleri katılmıştır. Elde edilen sonuçlara göre anne BKI ile çocuk BKI persentili arasında zayıf, pozitif bir ilişki bulunmuştur ($r=0.263$, $p<0.05$). Çocuğun günlük TV izleme süresi ile BKI persentili arasında anlamlı bir ilişki bulunmuştur ($p<0.05$). Çocuk BKI persentili ve annelerinin çocuklarının aşırı kilolu olduğu hakkında düşünceleri arasında anlamlı bir ilişki bulunmuştur ($p<0.05$). Çocuk beslenme anketi alt boyutlarından 'algılanan çocuk ağırlığı' ortalama puanı hafif şişman olan çocukların, normal olan çocuklara göre anlamlı olarak yüksek olduğu görülmüştür ($p<0.05$).

Anneler çocuklarının beslenmesi ve kilo durumları üzerinde etkili olduğu bu çalışma sonuçlarında görülmektedir. Bazı çocuk besleme uygulamaları ve diğer faktörler de anaokulu çağı çocuklarının BKI persentili üzerinde etkilidir. Gelecek dönemde annelerin çocuklarını besleme tutumları ile, hangi besin gruplarını ne kadar tercih ettiği ile ilgili daha fazla çalışma yapılabilir.

Anahtar Kelimeler: Beden Kütle İndeksi, Çocukluk Çağı Obezitesi, Obezite ile İlişkili Faktörler, Maternal Faktörler, Çocuk Besleme Uygulamaları.

1. INTRODUCTION AND PURPOSE

Childhood obesity associated with both short-term and long-term complications such as type 2 diabetes mellitus, insulin resistance, hypertension, metabolic syndrome, polycystic ovary syndrome, childhood and adolescent psychological problems, and obstructive sleep apnea syndrome; it has become an serious public health problem that has made a huge impact worldwide. The problem of childhood obesity is global, and children living in cities are particularly affected in low and middle-income countries. Childhood prevalence under the age of 5 is estimated to be over 42 million in 2010, and 35 million live in developing countries. If obesity development can be intervened in early childhood term, the prevalence of chronic diseases that may occur later in life can be reduced (1, 2).

The imbalance between energy intake and expenditure, that is, the increase in positive energy balance, is shown as the reason for the increase in obesity prevalence. Sedentary lifestyle and food preferences have been associated with a positive energy balance. In addition, genetic factors and environmental factors including family characteristics, parents' lifestyle, demographic information and school policies are also an important factor in childhood obesity. Diet-related factors such as sugary drinks, fast food consumption, snacks, and portion sizes contribute to increased childhood obesity. (2).

2 to 6 age children consume the food that their parents or caregivers give them. However, nutrition mostly depends on their mothers, therefore the healthy food choices that mothers offer to their children can have a positive effect on weight control of their children (2, 3). Mothers while making the healthy food choices for their children, they are affected by many factors. Factors such as education, employment status, child feeding practices or attitudes, nutritional knowledge or own habits are also associated with both maternal weight and the child's weight (2, 4-8).

Childhood obesity may not be related to nutrition alone. Situations such as lifestyle, environmental factors and habits in the family environment can have an effect on the BMI of children. Being more physically active like spending more time outdoors or attending classes such as physical education, reducing screen time spent in front of electronic devices such as televisions and tablets that will increase inactivity will help to provide energy balance (1, 2).

This thesis aims to determine the factors affecting the BMI percentile of 2-6 age children by emphasizing the importance of childhood obesity and helping to take precautions.



2. LITERATURE REVIEW

2.1. Early Childhood Period

The early childhood period is named by dividing into two groups as the 1-3 age toddlers and the 3-6 age pre-school period (3). Along this period children will become independent by focusing on individuals outside the family, questioning and willing to explore the events around them more. Interactions with their parents and people around them help to shape their movements, thinking styles and personality traits (4).

Development in childhood is a process that matures as a result of the regular advancement of perceptual, motor, cognitive, language, socio-emotional and self-control skills, and the skills to be acquired throughout life are based on the foundations established in early childhood. The Centers for Disease Control and Prevention (CDC) emphasizes that children in this period have the ability to such as ride a tricycle, put on and take off their clothes, play with other children, and sing. There are many factors that affect the acquisition of competences and skills, including health, nutrition, safety and security, responsive care and early learning (4, 5).

Parents play an important role for healthy development during this period; they try to teach their children to gain regular sleep, eating habits and to dominate their emotions (6). Especially in early childhood, the bond between the child and his/her mother is very valuable, because the mother is often responsible for the child's nutrition. The mother's behavior and attitude affects the nutrition of the child (7). Maternal psychosocial characteristics may have an impact on the infant and child's eating style. In addition to maternal psychosocial factors, demographic and anthropometric characteristics are also related to hunger and satiety perception. Parents' attitudes towards nutritional interactions and feeding styles develop in early childhood, and are related to the child's weight status (8). Overweight children experience deterioration in psychosocial functionality and quality of life compared to normal weight children of the same age. Unhealthy habits can be modulated the right direction before individual patterns become stronger. In the preschool age group, children and their parents can easily

implement the precautionary measures (9). Therefore, psychosocial treatments in early childhood are considered as the primary and most effective treatment approach (10).

2.2. Nutrition

In early childhood, nutrition plays an important role in growth and development. In addition, it is effective in the later stages of life and is an important indicator of children's individual nutritional status, public health and public nutrition (11).

Nutrition is essential for good health and development in the first years of life. Since it is difficult to change the habits gained in early childhood in the later stages of life, children in this age group should be given adequate, balanced and healthy eating habits. Especially in this period when children start to imitate their environment, family and lifestyle are also very important as well as environmental effects. Parent's practices such as eating styles, preparing healthy or unhealthy foods at home, and parents' nutritional knowledge and healthy behaviors are of great importance for the nutritional and physically active habits of young children. If the child cannot get the necessary amount of macronutrients such as carbohydrates; proteins and fats and micronutrients such as vitamin A; iodine; iron and zinc, they may develop diseases, have problems that may negatively affect the future of childhood or may even die (12-14).

Not having normal growth in childhood may result from the lack of adequate and balanced nutrition. Insufficient/excess intake of energy and nutrients may cause health problems in childhood or later in life. According to Turkey Nutrition Guide (TUBER), the most common nutritional problems in this age group are obesity, weakness and stunting, loss of appetite and tooth decay (3, 13). Children of this period need foods with high nutrient content but small in volume for the growth and development of teeth, bones, muscles, brain and nervous systems and organs (3). Children need foods with high nutritional value instead of high-energy dense foods (15).

The World Health Organization (WHO) does not make a definite dietary recommendations for early childhood and adolescence. WHO recommends increasing

consumption of fruits, vegetables and legumes, whole grains and nuts, limiting energy intake from total fats, providing fat intake from unsaturated fats instead of saturated fats, and limiting sugar consumption (16). In addition, it is recommended not to take excessive amounts of sodium, to have sufficient calcium, potassium, vitamin D and dietary fiber intake (17).

2.3. Nutrition-Related Problems

2.3.1. Energy Balance

Energy balance is the balance between energy intake and expenditure in order to achieve normal growth and maintain a healthy body weight (18). The rate of weight gain is affected by nutritional practices in infants and young children. Age-appropriate intake of energy and nutrients is necessary to support normal growth and development, as well as prevent acute nutritional problems such as iron deficiency anemia and tooth decay. Dietary energy intake, physically active, biological factors and environmental effects are important factors contributing to positive energy balance in children and adolescents (18-20).

Total energy intake, poor diet quality, and high energy density in early childhood are associated with overweight and obesity (20).

2.3.2. Malnutrition

Failure to meet daily energy needs and limited access to food sources cause malnutrition. In children who are malnourished for a long time, growth and development for age delays. According to the data of Turkey Nutrition and Health Survey (TBSA) of 2010, 10.3% of children have underweight and 5.6% of children have severe malnutrition between ages 0-5 (21, 22).

When defining malnutrition, it includes both undernutrition, inadequate supply of macro and micronutrients, and obesity, that is, excessive calorie intake, which may be

with or without sufficient micronutrients. Undernutrition from macronutrients in the early period is associated with low intelligence quotient (IQ), decreased school success and behavioral dysregulation. Adequate intake of macronutrients is essential for normal brain development. Insufficient supply of macronutrients and micronutrients, which play a key role in critical periods in brain development, may have lifelong effects on children (23).

Childhood malnutrition occurs mostly in children under 5 years of age in low- and middle-income countries and includes Stunting, Wasting, and Kwashiorkor (24). Stunting and severe acute wasting are often associated with accompanying micronutrient deficiencies, including vitamin A, iron, zinc, and iodine deficiencies are most common in childhood. Malnutrition continues to be a serious challenge in developing countries, harming the survival, growth and development of young children (5).

2.3.3. Obesity

The term obesity means excessive fat and defines the increase in weight gain due to an increase in fat. The vast majority of childhood obesity is exogenous obesity, caused by the imbalance between calories intake and energy expenditure. As the data of TBSA 2010 in our country, 17.9% of children have overweight and 8.5% of children have obese between ages 0-5. According to WHO data, as of 2016, it is estimated that there are more than 41 million overweight or obese children aged 5 years and under in the world. In addition, almost half of these children live in Asia and a quarter in Africa (22, 25-27).

2.3.3.1. Diagnosis of Obesity

In defining obesity, due to the lack of direct measurement of body fat and its high technical cost, BMI obtained from body weight and height has emerged as the accepted clinical standard measure for overweight and obesity in children aged 2 years and older. BMI is calculated by dividing body weight in kilograms by height in square meters. BMI generally estimates a moderate adiposity in the healthy pediatric population, but it may show a little more fat in children with short stature or high muscle mass and less fat in children with low muscle mass due to insufficient physically active (25, 26).

Childhood obesity has become one of the most important medical and public health problems today, and the increase in its prevalence causes the emergence of obesity-related comorbidities that pose a great burden not only on the affected (child) but also on the health system (25, 26).

Studies shown that the relationship between prevalence of obesity in most obese adolescence to even later life. Being overweight and early onset of obesity may increase the risk for high cholesterol levels, hypertension (HT), insulin resistance (IR), type 2 diabetes (T2DM), asthma and obstructive sleep apnea (OSA), which are risk factors of cardiovascular disease (CVD), and previously accepted as adult diseases. Additionally, it causes the emergence of comorbidities such as non-alcoholic fatty liver (NAFLD), gallstones and musculoskeletal disorders and is even associated with an increased risk of death in the later periods (16, 25-28).

2.3.3.2. Development of Obesity

Childhood obesity is the consequence of an interaction among many factors that are related to the environment, genetics, and family. Furthermore, it is related to numerous physical and psychological co-morbidities. It has been shown that the diet, stress and depression of the parents are associated with childhood obesity and eating behaviors. In addition, family history of obesity and obesity-related comorbidities are indicators that obesity will persist in adulthood. Therefore, implementing parent-based treatment programs that provide parenting skills training is recommended to prevent childhood obesity (25, 29).

Development of overweight and obesity in childhood is associated with the interaction between children's eating behavior and family environment. Eating behaviors are positively or negatively associated with obesity development. For example, food avoidance behaviors such as satiety responsiveness, food confusion and slow eating have been found to be negatively related to the development of obesity, while food approach behaviors such as food responsiveness and enjoyment in eating behaviors are positive with the development of obesity (30).

In addition, social and environmental factors such as role modeling, availability of food in the home, and parenting practices can also affect children's eating behaviors. There is an important relationship between eating behaviors of preschool age children and feeding practices of parents because children are still highly dependent on their parents (31).

2.4. Parental Effects

Parents are one of the most important factors affecting children's eating habits and diets. Some parental feeding practices are promoting healthy nutrition eating patterns in children, while others may lead to unhealthy and irregular eating habits (32).

The parents who control portion sizes, meal times and snacks by deciding what foods their children can access determine first food learning experience. Also parents use practices such as pressure to eat, restriction of certain foods or groups of foods, rewards with food, monitoring child's eating and controlling child's food intake in order to attain a healthy development of their children (33).

Several studies have reported the relationship between parents BMI and child's BMI. It has been observed that children of parents with healthy BMI display healthier behaviors than children of parents with higher BMI. According to these results, the body weight status and health behaviors of the parents affect their children's weight status and health behaviors (34-37).

The obesity status relationship between parents and children varies according to the age and gender of the child. As children mature and become more independent their parents influence on their children's behavior decreases. According to the findings of the study conducted by Lee et. al., early life may be the best opportunity for interventions to prevent childhood obesity before children develop their own unhealthy behaviors and weight status (34).

A cohort study examining obesity-related dietary patterns and eating behaviors of children with obese mothers reported that these children were at high risk of developing obesity (38).

According to the results of a study involving 7,644 children from seven European countries, it has been shown that the mother's BMI is the strongest factor in the increased BMI values of children (39).

Some factors such as nutritional knowledge level, education status, employment status, body weight, age of the mother can be effective on eating behaviors of their children. In addition, higher maternal BMI is related to higher child's BMI and sedentary behavior, less fruit consumption, and more TV viewing because mother is the closest person to the child and the first person to shape their behavior and lifestyle (28, 34, 40).

2.5. Maternal Factors

Various studies of BMI and early childhood show that there is a connection between factors such as pregnancy exposures, perinatal factors, breastfeeding status and early lifestyles (25, 40-42).

2.5.1. Perinatal Factors

Some perinatal factors are associated with the development of adiposity in infants. In parallel with the increase in the incidence of some perinatal factors such as prematurity and low birth weight, the incidence of childhood obesity is also increasing (43).

Low birth weight (<2500 g), normal birth weight (2500–4000 g) and high birth weight (>4000 g) are considered. Birth weight of infants may have an effect on adiposity. It appears that infants with low birth weight are more likely to have higher adrenal androgen levels, insulin resistance, and central fat deposition. High birth weight in infants too may be a risk factor for obesity and a variable in estimating the BMI in preschool age

children. Children with high birth weight are more likely to be overweight compared to children with a normal birth weight (28, 44).

2.5.2. Breastfeeding

Breast milk is the ideal food for infants as it provides enough energy and nutrients to meet babies' needs. Breast milk ensure all the energy and nutrients that the infants needs for the first months of life and is a complex and unique product containing water, carbohydrates, proteins, fats, vitamins and minerals in sufficient amounts. Also contains many antibodies that help protect against several childhood diseases (45, 46). WHO recommends exclusive breastfeeding in the first 6 months (46).

Breastfeeding is emphasized that it can be a protective factor against childhood obesity. Protein quality and the low protein content of breast milk are associated with a lower risk of obesity in childhood (41, 46, 47).

According to the results of a study investigating longitudinal changes in BMI and associated risk factors in Ireland in the first 5 years of life, children who were breastfed for 6 months or more had a lower BMI at 9 months compared to children who were never breastfed (41).

2.5.3. Formula Feeding

Breastfeeding appears to be more advantageous for newborns compared to formula feeding (48). Breastfed infants can control their milk intake as they can decided when to begin and when to finish. In addition, while physiological satiety is controlled by withdrawing milk from the breast, the parents of infants fed with formula usually make this decision. Non-breastfed infants may experience increased fat and the risk of developing obesity by taking more energy (45).

Appropriate protein intake should be encouraged by avoiding excessive protein intake during the first year of life and/or after the infant is weaned (49). Infant formulas especially with high protein and nutrient-enriched may cause the consumption of more nutrients than requirements which may cause a rising of lipogenesis and development of fat cells. In addition, leptin hormone found in breast milk does not exist in formula. The leptin level in breast milk could effect on the infants weight in the first 2 years of life (45).

2.5.4. Complementary Feeding

The term complementary feeding included all solid and liquid foods except breast milk or infant formula and follow-on formula. There is not a clear relationship between the transition to complementary feeding and the risk of obesity. However, suggested that introduction of complementary foods at 4th month or earlier may increase the risk of childhood overweight (43).

2.5.5. Employment Status of Mothers

The absence of mothers from the home environment due to their employment status may affect the dietary habits of their children. This situation may cause shortening breastfeeding period and early introduction of complementary foods (47).

2.5.6. Preparing Meals at Home

Preparing meals at home may be a better choice, as the consumption of convenience food and fast food can cause more energy intake and poor nutritional quality. Compared with food prepared at home, food prepared outside the home can contain food additives and many preservatives, and these foods are commonly higher in calories, total and saturated fat, and may has less fiber, calcium and iron. Besides, cooking with the child at home may be beneficial for healthy child development, to earn healthy eating habits and to have a better relationship with their parents by enjoying mealtime more.

There is a consensus that home cooking can be effective in preventing obesity and chronic diseases (50, 51).

2.6. Physically Active

Obesity is thought to be developing when genetic factors interact with some environmental factors. Modified lifestyle because of urbanization with increased calorie intake and reduced physical activity are environmental factors that increase the risk for development of obesity (26).

Individuals of all ages should be physically active to improve well-being. Being active can improve significant movement skills and increase growth and development. It is necessary for children to engage in age-appropriate activities for their physical and mental health. Parents should encourage their children making physical activity, since they have an important role in their child being physically active. Children with parents who are not good role models and do not have suitable places for physically active, do not apply qualified physical education lessons in schools may have decreased physically active. In addition, children's anxiety about being successful in academic life may also reduce their physically actives (25, 26, 52).

The physical activity goals of the child by the Mayo Medical Education and Research Foundation is as: It was suggested that it should be determined according to the child's physical activity preference, age, and exercise tolerance (25). Guidelines for daily physically active are not well defined for this age group, although The American Medical Association (Physical Activity Guidelines for Americans) reported that a reasonable goal could be 3 hours of activity per day in all intensity, mild, moderate, or severe. This is in line with the guidelines of Canada, the UK and the Commonwealth of Australia (52).

2.7. Screen Time

Watching television (TV) is one of the factors associated with both physically active and food consumption. Therefore, some studies observed that watching TV for a long time has an effect on the child's BMI (53, 54).

It has been observed that the relationship between childhood obesity and watching TV is more significant among preschool children. Because at early childhood period children spend commonly most of their times at home and are more likely to be exposed to the TV environment (55).

There are several potential reasons for the association between watching TV and obesity. Firstly, watching TV while having snacks and meals has been found associated with overweight/obesity in children. Watching TV may shape unhealthy dietary habits and increase the total energy intake because prolonged duration of TV exposure may increase snacking and consumption of high fat, high-sugar, or high-calorie foods and decrease fruit and vegetable consumption (28, 56). Secondly, it may lead to exposure to unhealthy food advertisements because advertisements can influence children's food preferences and purchase requests directed at parents. Children exposed to advertisements requested to consume much more junk food than children who are not exposed, and this can lead to childhood obesity (56).

Additionally, the presence of a TV in a child's bedroom has been shown to be directly related to the prevalence of obesity. TV viewing may reduce sleep duration and being physically active and increase the amount of sedentary activity (25, 56).

The American Academy of Pediatrics suggests children over the age of two not to watch TV more than 2 hours a day, also not have TVs in their bedrooms (57).

2.8. Sleep Pattern

Sleep duration and sleep quality is very important for growth and development in preschool aged children. There is a relationship between sleep and obesity. Especially in children under 5 years of age, shorter sleep duration is related with reduced growth, increased adiposity and higher risk of injury (25, 58). Shortening of sleep time and staying wake will cause more food consumption, thus leading to weight gain (26).

In addition, sleep may also have an association with decreased insulin sensitivity, independent of the association with adiposity. The recommended sleep duration for preschool children is 10 to 13 hours per 24 hours (25).

2.9. Stress

Stress factors experienced by young children in their early life; include maltreatment (e.g. abuse/neglect); chaotic home environments; and exposure to other negative life events, such as witnessing violence or trauma or experiencing material deprivation. In fact, different stress factors can activate different paths; experiencing chronic or severe acute stress early in life can have a powerful impact on the developing child. Stress factor may affect health behaviors, food consumption and obesity in children. Limited research explained how early life stress affects multiple biological and behavioral pathways that interact, which can increase the risk of obesity during childhood and beyond. At this point, it has been shown by studies that high cortisol levels may increase obesity (17, 59-61).

According to the results of the study by Armoon and Karimy, stress management has been reported to be an important factor in predicting the BMI of children, and stress-induced over eating can contribute to obesity. Children can learn this behavior from their mothers because it has been shown that people can exhibit eating behaviors to reduce stress (28).

3. MATERIALS AND METHODS

3.1. Participants

This study is conducted between September 2020 - October 2020 on 4 voluntary kindergartens (Private Çilek Ağacı Kindergarten, Private Göztepe Çilek Ağacı Kindergarten, Private Mavi Gezegen Kindergarten, Private Yöm Göztepe Kindergarten) in Göztepe district of İstanbul.

An e-mail was sent to all kindergartens (n=16) in Göztepe district and kindergartens which gave positive feedback (n=4) were included. A signed preliminary petition form was received from them, indicating that they volunteered to carry out the data collection form part of the study in their schools (**Appendix 1**). Voluntary children, aged between 2 to 6 of voluntary parents registered to those kindergarten were included in the study with a total sample of 193 children, 106 (54.9%) girls and 87 (45.1%) boys, who meet the inclusion criteria. Only one of the siblings attending the same school was evaluated. Before starting the study, written permission (informed consent form) (**Appendix 2**) was obtained from the mothers of the children. Participants with chronic diseases and metabolic diseases that require special dietary restrictions were not included in the study. Incomplete or incorrect data collection forms were not included in the study. Also, although the some mothers initially agreed to participate in the study, later dropped out because of questions the found private or complicate.

Approval of the Ethics Committee dated 30.12.2019 from the Yeditepe University Clinical Research Ethics Committee (**Appendix 3**), and the approval dated 23.06.2020 from the Provincial Directorate of National Education of the Governorship of Istanbul was obtained before the study (**Appendix 4**).

3.2. Data Collection

3.2.1. Anthropometric Measurements

The children's body weights (kg), height (cm) and birth dates (day/month/year) from the school records or information form were taken. BMI was calculated by dividing body weight in kg by the square of height in meters (kg/m^2), and BMI percentiles were classified using the WHO Anthroplus program (62).

According to classified as follows WHO child growth standards;

<3. percentile: extremely weak

≥ 3 - <15. percentile: underweight

≥ 15 - <85. percentile: normal

≥ 85 - <97. percentile: overweight

≥ 97 . percentile: obese (63).

3.2.2. Data Collection

The data collection (**Appendix 5**) was divided into three parts: demographic information about the child, information about the parents and other information such screen time, physically active, stress.

Collected demographic information about the child; it includes the child's date of birth, sex, body weight and height.

Informations obtained from parents; were the mother's and father's, date of birth, body weight, height, educational level and employment status. BMI values of the parents was calculated by the researcher. BMI values of the parents was calculated in kg/m^2 .

BMI classification for adults is as follows (64).

<18.5: underweight

18.5 to <24.9: normal

25.0 to <29.9: overweight

≥ 30.0 : obese.

Other independent variables that may affect BMI and childhood obesity was shaped as a result of the current literature review (1-61).

In this part, infants birth week, birth weight, duration of breastfeeding, formula use, transition time to complementary food, cooking at home, how often food is cooked, duration of the child's daily physically active, daily sleep duration, the duration of watching television, which snacks the child preferred most, stress in his or her life, whether he or she was overweight, and his or her mother's education source on nutrition were compared.

Questions have four options as A, B, C and D.

Personal information such as demographic characteristics and which snacks he or she prefers were as a blank filling and his or her answer was written by the mother who filled the information form.

3.2.3. Child Feeding Questionnaire (CFQ)

Child Feeding Questionnaire (CFQ) was used to evaluate mothers' child feeding attitudes and practices as well as perceptions and interests in childhood obesity (**Appendix 6**). CFQ consisting of 24 questions, the first version was developed in 1994 by Johnson and Birch and reliability and validity was determined by the Camcı in Turkey in 2010 (65, 66).

CFQ consists of 3 subscales (Restriction, Monitoring, Pressure to Eat) that evaluated parents' controls over child nutrition and 4 subscales (Perceived Responsibility, Perceived Parent Weight, Perceived Child Weight, Concern About Child Weight) that evaluated assess parents' child feeding attitudes and behaviors. The items are evaluated

with a 5-point likert scale and each question in each sub-dimension is evaluated on 5 points. As the scores of the CFQ sub-dimensions increase, beliefs or attitudes reflecting the sub-dimension are supported. "Perceived Child Weight" subscale shows the degree of parents accepting the child as being overweight at various ages. "Perceived Responsibility" subscale shows determining how responsible the parent feels about feeding the child, portion sizes and preparing a healthy diet. "Concern About Child Weight" subscale shows how concern and interested the parent is about the child's current body weight and the possibility of gaining excess weight. "Restriction" subscale shows to what extent the parent restricts the type or amount of calorie foods consumed by the child. "Pressure to Eat" subscale aims determining the level of encouragement of the child to eat. "Monitoring" subscale is determined to what extent the parents monitor how much sweet, junk-food and fatty food the child consumes. (64, 65). Prior to study, permission was obtained from Camc1 via e-mail (**Appendix 7**).

3.2.4. Statistical Analysis Method

In this study SPSS version 23.0 was used for the statistical analysis.

Descriptive statistics such as frequency, percentage, mean, standard deviation, minimum and maximum were performed. Parametric tests were used to analyze the data as it had a normal distribution when evaluated with values of kurtosis and skewness (67). Independent samples t test was used to compare 2 independent groups, and One-way ANOVA test result was used for comparing more than 2 independent groups. Pearson correlation was performed to analyze the relationship between 2 quantitative parameters. For ANOVA test, Levene test was performed for variance homogeneity and Tukey HSD was performed if variance homogeneity is provided for group differences ($p \leq 0.05$). All test results were evaluated at 0.05 significance level.

4. RESULTS

When the distribution of children by sex is evaluated in this study, 54.9% of the children were girls ($n = 106$) and 45.1% ($n = 87$) were boys; the mean age of the children was 4.1 years and mean BMI percentile value was 66.4. Mean values for percentiles of weight for age and height for age were 59.2 and 45.9 respectively.

According to the distribution of the children BMI percentile groups, 13.3% of them were underweight (<15 . percentile), 15.5% were normal ($\geq 15 - <85$. percentile), 17.4% were overweight ($\geq 85 - <97$. percentile) and 20.7% were obese (≥ 97 . percentile).

When anthropometric measurements of mothers are evaluated in this study; mean age of mothers was 37.7 years (min. 27- max. 47 years), mean conception age was 31.4 years (min. 22 – max. 41 years) and mean BMI value was 24.3 kg/m^2 (min. $16.0 - \text{max. } 42.4 \text{ kg/m}^2$). In addition, when BMI groups of mothers are evaluated; 3.1% of the mothers were underweight, 63.2% were normal, 23.3% were overweight and 10.4% were obese. According to the educational level of the mothers, 3.1% of them were primary or secondary school, 9.3% were high school, 69.4% at university and 18.1% were higher education graduates level. 64.2% of the mothers were employed.

When the anthropometric measurements of fathers were evaluated in this study; mean age of fathers was 40.2 years (min. 31 – max. 57 years) and mean BMI value was 26.8 kg/m^2 (min. $19.1 - \text{max. } 38.7 \text{ kg/m}^2$). In addition, when BMI groups of fathers are evaluated; 31.1% of the fathers were normal, 53.4% were overweight and 15.5% were obese. According to the educational level of the fathers, 3.6% of them were primary or secondary school, 18.1% were high school, 61.1% at university and 17.1% were higher education graduates level. 98.4% of the fathers were employed.

General characteristics of the children is shown in Table 4.1. 2.1% of the children had a birth week under 33 weeks, 10.9% between 33-36 weeks, 80.3% between 37-41 weeks and 6.7% over 42 weeks. 7.3% of infants were born below 2500 g, 85.5% were born between 2500-4000 g, 7.2% were born under 4000 g. 70.5% of infants were

breastfed for more than 6 months, 57.5% of mothers were used formula for their children. 76.1% of mothers started complementary foods when their infants were older than 6 months. 99.5% of mothers of children cook at home, 77.2% of mothers of children cook at home every day.

It was found that 81.8% of their children had more than 3 hours of physically active, 63.5% of their children had less than 12 hours of sleep per day, 44% of their children watched TV for 30-60 minutes and 68.4% of them preferred snacks while watching TV.

In this study, 27.5% of the mothers mentioned stress in life of their children, 1.6% of mothers mentioned that their children were overweight and 32.6% received information/education about child nutrition from someone or somewhere.

Table 4.1. General Characteristics

		n	%
Birth Week	<33 weeks	4	2.1
	33-36 weeks	21	10.9
	37-41 weeks	155	80.3
	42+ weeks	13	6.7
Birth Weight	2500 g>	14	7.3
	2500-4000 g	165	85.5
	>4000 g	14	7.2
Breastfeeding Duration	Never	5	2.6
	Less than 3 months	16	8.3
	4-6 months	36	18.7
	More than 6 months	136	70.5
Has Your Child Ever Used a Formula?	Yes	111	57.5
	No	82	42.5
Child's Transition Time to Complementary Food	Less than 4 months	10	5.2
	4-6 months	36	18.7
	More than 6 months	147	76.1
Cooking at Home	Yes	192	99.5
	No	1	0.5
Frequency of Cooking at Home	Several times a month	3	1.6
	Several times a week	41	21.2
	Everyday	149	77.2
Daily Physical Activity	Less than 3 hours	37	19.2
	More than 3 hours	156	81.8
Daily Sleep Duration	Less than 12 hours	122	63.5
	Between 12-14.9 hours	64	33.3
	More than 15 hours	6	3.2
Daily Duration of TV Watching	Never	10	5.2
	30 minutes a day	42	21.8
	30-60 minutes a day	85	44.0
	More than 60 minutes	56	29.0
Preferred by children a snack while watching TV	Yes	132	68.4
	No	61	31.6
If the Mother Thinks the Child's Life Has Stress	Yes	53	27.5
	No	140	72.5
If the Mother Thinks the Child is Overweight	Yes	3	1.6
	No	190	98.4
Received Any Information / Education on Child Nutrition	Yes	63	32.6
	No	130	67.4
Total		193	100

When the frequency distribution of the snacks preferred by the children and answered by the mothers is examined (Table 4.2.), fruit and vegetable was the most common answer as 64.6%. Subsequently, it was observed that they preferred 36.2% nuts, 36.2% instant fatty snacks, 20.0% homemade snacks, and 10.0% milk and dairy. It was also observed that 6.2% of the children ate their main meals in front of the TV.

Table 4.2. Descriptive information on snacks answered by mothers and preferred by children while watching TV.

	Number of answers (n)	%
Fruit and vegetable	84	64.6
Nuts	47	36.2
Instant snacks such as chips, chocolate, pretzels	47	36.2
Homemade snacks such as cakes, cookies, popcorn	26	20.0
Milk and dairy	14	10.0
Her/his eats his main meals in front of the TV	8	6.2

BMI values in percentile of children were evaluated according to sex (Table 4.3.), BMI values in all BMI percentile groups did not differ significantly between the sex of the children ($t=0.163$; $p=0.871$, $p> 0.05$).

Table 4.3. Relationship Analysis of According to Sex of the Child and Child BMI Groups

Sex	n	Mean	SD	Significance
Girls	106	66.858	27.5691	$t=0.163$
Boys	87	66.154	66.154	$p=0.871$

t=Independent Samples Test

The relationship between maternal education and child BMI percentile values was evaluated, no significant relationship was found between maternal education level and child BMI percentile value ($F= 5.725$; $p= 0.234$; > 0.05). Increased maternal education level did not show any increase or decrease on child BMI percentile value. The relationship between the maternal employment status and the child's BMI percentile value was evaluated, there was no significant relationship between the maternal employment status and the child BMI percentiles ($t=0.631$; $p= 0.529$, > 0.05). Maternal employment did not have any effect on the child's BMI percentile value.

There was no significant relationship between paternal BMI and child BMI percentiles ($F=2.030$, $p=0.134$, $p> 0.05$). There was also no significant relationship between paternal education level and child BMI percentiles ($F= 0.899$; $p=0.443$, $p> 0.05$). When the relationship between paternal employment status and child BMI percentile value was evaluated, no significant relationship was found between paternal employment status and child BMI percentile values ($t= -0.136$; $p= 0.892$, $p> 0.05$).

Table 4.4 shows the correlations between child's BMI percentile and maternal BMI, paternal BMI, conception age of the mother, birth weight. There was a weak positive relationship between maternal BMI and child's BMI ($r=0.263$; $p=0.000$, <0.001), while there was no correlation between child's BMI percentile and paternal BMI, conception age of mother or birth weight.

Table 4.4. Correlations between child's BMI percentile and maternal BMI, paternal BMI, conception age, birth weight.

	Significance	Maternal BMI	Paternal BMI	Conception Age	Birth Weight
Child's BMI Percentile	Pearson Correlation	.263**	.100	-.048	.100
	Sig. (2-tailed)	.000	.167	.503	.166
	n	193	193	193	193

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The relationship between the child's BMI percentile and birth week, breastfeeding duration, formula usage, transition time to complementary food, and cooking frequency by mothers is analyzed. Only one of 193 mothers mentioned she did not cook at home. Thus, comparative analyses were not performed. There was no significant relationship between child's BMI percentile and birth week ($F=1.399$; $p=0.245$); breastfeeding duration ($F=0.578$; $p=0.630$); formula use ($t=-0.461$; $p=0.645$), transition time to complementary food ($F=0.407$, $p=0.666$) and cooking frequency by mothers ($F=0.800$; $p=0.495$).

In Table 4.5., the relationship between child BMI percentile and children's being physically active, daily sleep time, daily duration of TV watching, snacking while watching TV status is shown. There was a significant relationship between child's BMI percentile and daily duration of TV watching ($F=3.296$; $p=0.022$, <0.05). Post-Hoc Tukey analyses showed that there was a significance difference between the groups 30 min/day and >60 min/day. There was no significant relationship between child's BMI percentile and the duration of being physically active ($F=0.578$; $p=0.562$), daily sleep time ($F=1.010$; $p=0.366$), and snacking while watching TV ($t=1.283$; $p=0.201$).

Table 4.5. The Relationship between Child BMI Percentile Value and Children's Duration of Being Physically Active, Daily Sleep Time, Daily Duration for TV Watching, Snacking While Watching TV

	n	$\bar{X}$	SD	Significance*
Physically active duration				
< 3 hours/day	35	62.797	35.2049	F=0.578 p=0.562
> 3 hours/days	156	67.182	28.7551	
= 3 hours/day	2	82.05	8.1317	
total	193	66.541	29.8785	
Daily Sleep Time				
<12 hours	122	66.673	28.9155	F=1.010 p=0.366
12-14.9 hours	64	65.364	30.6275	
> 15 hours	6	83.433	38.8812	
Total	192	66.76	29.8002	
Daily TV Watching Time**				
None	10	65.62	30.0894	F=3.296 p= 0.022
30 min/day	42	57.931	32.5551	
30-60 min/day	85	64.625	28.2206	
>60 min/day	56	76.071	28.4072	
Total	193	66.541	29.8785	
Snacking While Watching TV				
Yes	80	69.815	28.5122	t=1.283
No	113	64.223	30.7228	p=0.201

*t=Independent Samples Test, F= One way ANOVA

**Post-Hoc Tukey analyses showed that there was a significance difference between the groups 30 min/day and >60min/day.

The relationship between the child's BMI percentile and maternal thought on child's stress and being overweight or not, and if the mothers are educated about child nutrition was evaluated. There was no significant relationship between child's BMI percentile and stress status ($t=0.323$; $p=0.747$) and maternal educational status on child nutrition ($t=-0.260$; $p=0.795$) while there was a significant relationship between child's BMI percentile and the mother's thoughts if their children has excessive weight ($t=7.954$; $p= 0.001$).

In Table 4.6., the CFQ sub-dimension scores are shown. It was evaluated with one-way analysis of variance according to the child BMI. Perceived child weight mean score, which is one of the sub-dimensions of the CFQ, showed a significant difference

according to the child BMI groups ($F(3,187): 3.989, p \leq 0.05$). The homogeneity of the group variances was tested by Levene test and it was determined that the variances were homogeneously distributed ($p \geq 0.05$). According to the results of Tukey HSD test conducted to determine which BMI groups differ between groups, it is seen that the mean perceived child weight mean score of children with overweight BMI ($\bar{X}: 9.56, SD: 1.54$) is significantly higher than the mean score of children with normal BMI.

However, the mean scores of the other sub-dimensions of the CFQ do not differ significantly between the BMI groups ($p > 0.05$).



Table 4.6. Comparison of CFQ Sub-Dimension Scores According to Child BMI Groups

		Child BMI Groups								F (p)
		<15		≥15 - <85		≥85 - <97		≥97		
		percentile : underweight (n=14)		percentile: normal (n=104)		percentile: overweight (n=39)		percentile: obese (n=36)		
		$\bar{X}$ SD		$\bar{X}$ SD		$\bar{X}$ SD		$\bar{X}$ SD		
Perceived Responsibility		12,57	2,41	12,91	2,23	12,95	2,10	12,25	290	0,819 (0,485)
Perceived Weight	Parent	10,57	2,53	11,68	2,54	11,36	2,23	12,39	2,38	2,180 (0,092)
Perceived Weight	Child	8,64	1,65	8,70	1,49	9,56	1,54	9,11	1,21	3,642 (0,014*)
Concern About Child Weight		11,00	2,39	11,46	2,66	11,51	2,25	11,19	2,57	0,237 (0,870)
Restriction		31,57	4,07	29,88	5,19	31,23	4,78	32,03	4,37	2,170 (0,093)
Pressure to Eat		10,86	4,22	12,29	3,97	11,10	3,81	12,92	4,44	1,786 (0,151)
Monitoring		13,21	1,42	13,68	1,77	13,38	1,95	12,83	2,66	1,716 (0,165)

*One-Way ANOVA Analysis, *p≤0.05*

5. DISCUSSION AND CONCLUSION

Early childhood, especially preschool age, when growth and development continue, is an appropriate period that can be intervened to prevent ever-increasing childhood obesity. There is a relationship between the prevalence of obesity in adolescence and later in life in most obese kindergarten children. Children who are obese at a young age are less than 20% likely to reach normal weight in adolescence. It has been shown that severe obesity is observed in adulthood in those with obesity in themselves and his/her family (25, 27, 28).

If the child has been overweight for a long time in childhood, likelihood of developing established obesity increases may occur. It can be difficult for individuals who were obese or overweight as children to reach normal weight in adulthood (68). According to the results of a study conducted on individuals living in California, the participants who were overweight or obese at the age of 5 (≥ 85 . percentile) was found to be significantly related to higher BMI values at about 50 years of age (69). In another cohort study, childhood BMI was shown to be related with adiposity in adulthood (70). Determining the risk of obesity in childhood or taking precautions against obesity will help reduce risk in adulthood overweight or obesity (71).

Carried out in our country, TBSA 2010 data found that in children 0-5 years of 8.5% were obese; according to gender distribution, it was seen that 10.1% of boys and 6.8% of girls were obese (22). Similarly, Önal et al. found that in 2016, boys had a higher weight than girls did, 6.1% of boys and 1.8% of girls were obese and boys were more affected by environmental conditions (21). In another study conducted with children aged between 2-7 years, 5.8% of children were found to be overweight and 12.8% were found obese (72). Kanioğluları found that study in preschoolers in 2015, 28.3% of the children were overweight and 13.3% of the children were obese (73).

54.9% of the children in our study were girls, 45.1% were boys, and 104 children were in the normal BMI percentile group ($\bar{X} = 15.5$, $p = 0.000$), 39 children were in the overweight group ($\bar{X} = 17.4$, $p = 0.000$), and 36 children were in the obese group ($\bar{X} = 20.7$, $p = 0.000$). BMI values in all BMI percentile groups did not differ significantly

between the sex of the children ($t=0.163$; $p=0.871$, $p> 0.05$). Although childhood obesity has been an important problem that has been emphasized for long years, when the results of the study are examined, it is seen that a significant part of the children in the early childhood period is overweight or obese. Even more, our study results are compared with to some results of studies, it is seen that the percent of children obesity rate is gradually increasing in over years.

The emergence of obesity in childhood begins before the child was born that is, in the intrauterine environment (25, 74). Neonatal adiposity is associated with childhood BMI, the higher the adiposity, the greater the risk of overweight and obesity. Children's weight should be in the ideal range. As a result of a study conducted with children between the ages of 2 and 6, there was a relationship between neonatal adiposity and childhood BMI without changing factors such as ethnicity and breastfeeding, and this relationship did not change over time (75). In a study published in 2018, children with low birth weight had importantly lower z-BMI than born at normal weight children. However, the z-BMI of highest strata of birth-weighted children remained importantly higher (76). According to the results of a study in our country conducted with 225 individuals who were born preterm and completed the age of 3, it was observed that the obesity rate at the age of 3 were approximately 33%. Moreover, there was not a significant difference in terms of nutritional status and maternal factors (77).

Childhood obesity can be affected by both high birth weight and low birth weight (78). Nor et al. found that higher birth weight of the child increased the likelihood of obesity in later childhood (79). A meta-analysis findings shown that those born ≥ 4000 g or ≤ 2500 g (higher in those with ≥ 4000 g) may be associated with an increased risk of obesity from childhood to young adulthood (80). On the other hand, according to an observational cohort study conducted in the USA, a birth weight of ≥ 4000 g was found to be protective against preschool childhood obesity. However, it is estimated that the reason for this may be the fear of weight gain and the increased awareness about feeding problems and excess weight in parents (81). In our study, no significant relationship was found between birth weight and birth week with the children BMI percentile.

Breastfeeding can be beneficial for the health of the mother and child especially diseases, is also a protective factor for childhood obesity (48, 82). A meta-analysis including 26 studies by Qiao et al., it was found that breastfeeding is inversely related to the risk of obesity in children aged 2-6 years and, there was a dose-response effect between duration of breastfeeding and decrease regarding obesity (83). Similarly, in the results of a study in Bangladesh, it was seen that breastfeeding in children under the age of 3 is protective against obesity (84).

United Nations International Children's Emergency Fund (UNICEF) shows that 20-40% of infants in our country continue to be breastfed until the age of 2 (85). Breastfeeding has superiority in newborns over formula-fed infants (45). It has been found that breastfed infants have a lower risk of obesity compared to formula-fed infants (48). According to the results of a study conducted in Canada, it was shown that children who only take breast milk are less likely to be obese than infants who take breast milk and formula together. In addition, the duration of breastfeeding has reduces the risk of childhood obesity by about 14% per month (86). According to a study conducted in our country, it was seen that formula feeding may enhance body weight more in children aged 2-5 years compared to breastmilk feeding (87).

Formula-fed infants get more protein and fat than they need and, high protein and fat intake are associated with adiposity in early childhood. Formula feeding in children may increase the risk of developing obesity since it will affect hunger-satiety signal and appetite control since nutrition will be out of their control (48, 88). Based on the results of a cohort study, infants born at term, formula-fed and breastfed for less than 4 months, starting complementary feeding before 4 months have a higher risk of overweight in childhood (89).

In this present study, 70.5% of infants received breast milk for more than 6 months and found that no significant relationship was found between breastfeeding duration and the child's BMI percentile ($F=0.578$; $p=0.630$). In this study, 57.5% of the infants were formula-fed. On the other hand, transition time to complementary food was found to be 76.1% at 6 months and later. In our study, no significant relationship was found between formula usage ($t=-0.461$; $p=0.645$), and transition to complementary food ($F=0.407$,

$p=0.666$) and the child's BMI percentile ($p>0.05$). These results may be due to the low rate of breastfeeding and the vast majority of them using formula and, transition time to complementary food before the 6th month. The vast majority of mothers may not be know right duration or information because they haven't been educated somewhere or someone about child nutrition. In addition, it may be due to the decrease in breastfeeding and the increase in the use of formula, with the majority of mothers employing.

There is a relationship between the body weight of the parents and their children. Bammann et al. reported that the relationship between parents and the child's BMI is strong (90). Maternal obesity is one of the most important factors directly associated with childhood obesity and, higher maternal BMI is associated with the child's BMI and factors related to obesity (91, 92).

Considering the maternal BMI classification in this study, 23.3% of the mothers were overweight and 10.4% were obese. In these findings, its substantial percentage is in an abnormal range (overweight and obese classification).

In this study, when the relationship between the maternal BMI and the child BMI percentile was evaluated, there was a weak, positive relationship between maternal BMI and child's BMI ($r=0.263$; $p=0.000$, <0.001). Maternal overweight or obesity is an important factor that increases childhood obesity. The mother's being overweight or obese will increase the risk of her child being overweight or obese.

Maternal feeding behaviors and feeding practices can have an impact on the weight of the children. Especially factors such as cooking at home, mealtime and eat together at the table are focused on the nutrition of parents and their children (28, 40). In this study, while 99.5% of the mothers were cooking at home, 77.2% were cooking at home everyday. In our study, only one of 193 mothers mentioned she did not cook at home. Thus, comparative analyses were not performed. But, no significant relationship was found between cooking frequency by mothers and the children BMI percentile ($F=0.800$; $p=0.495$).

Maternal employment status may affect children's weight. Maternal employment causes individuals other than parents such as caregivers and grandparents to taking care of the children. In a study observed in children up to 12 years old; it has been shown that the risk of obesity and overweight is decreased, especially when childcare is mainly in the parent between child ages of 3-5 (93). In addition, maternal employment causes changes in the nutrition of children by increasing the use of prepared foods and high-calorie foods as a result risk of developing obesity may increase (28). Employed mothers with better income are thinking that preparing healthy food for their children is an extra workload. In addition, they are thinking it takes a long time to prepare healthy food because time they spend at home is shorter (94).

According to our study results, 64.2% of the mothers were employed. Also, there was no significant relationship between the maternal employment status and the child BMI percentile ($t=0.631$; $p= 0.529$, > 0.05). This result may be due to the fact that our study was conducted on preschool children. The child will not be able to see his/her mother because he/she is at school in that time period, whether his/her mother is home or not.

On the other hand, the education level of mothers is also effective on children's eating habits and healthy nutrition. As education level of mothers increase, their attitudes towards healthy eating both increase (94). According to the study of Aksoy and Oğur, it was determined that majority (54%) of mothers of obese children were primary school graduates and 70% were housewives (95). Yabancı et al. found that children of mothers with high education preferred healthy foods such as fruits, eggs, dairy products more than those with medium and low education levels (40). On the opposite, according to the results of another study, it was shown that mothers' education levels and high nutritional knowledge and attitudes alone did not affect the improvement of children's nutritional status (96). TBSA 2010 data, in our country, showed that 17.7% of the education level of mothers is high school and higher education (22). According to our study results, 9.3% of the mothers were high school, 69.4% at university and 18.1% were higher education graduates level. Also, no significant relationship was found between maternal education level and the children BMI percentile ($F= 5.725$; $p= 0.234$; > 0.05).

When the nutritional knowledge levels of the parents increase, their children's healthy eating and gaining appropriate nutritional habit has increase. However, parents should also have sufficient knowledge to help their children obtain the right nutritional habits (97, 98). Yabancı et al. found that nutritional knowledge level of mothers was effective on the eating habits of their children. In addition, education level of the mother is also effective; it was observed that mothers with higher education level had higher scores (40). Farajzadeh-Moghanjoughi et al. found that a positive correlation between the food preferences of children and mothers in all food groups ($P < 0.001$) (96). According to Göbel's study in our country, it has been determined that parents are effective in food selection of children, and there is an increase in healthy food consumption of children after the training (99). According to the results of this study, 32.6% of mothers were received training or information on childhood nutrition, and 67.4% of mothers were not. This result may be a supportive factor with the relationship between of maternal BMI and their children's BMI percentile. If mothers take a right information about nutrition, it can have a positive effect on both decrease their BMI and their children's BMI.

Maternal concern about their child weight may be a factor associated with childhood obesity. Maternal perception their children's weight as normal has associated with an increased risk of children being overweight (100). According to the results of a study with preschool children in Australia, only 5% of mothers stated that they were concerned about their child's present body weight, although 19% of the children were overweight or obese classification and, also mothers of overweight girls were reported more than mothers of boys (101). Similarly, in another study, 79% of the mothers stated that although their children were overweight, they did not see their children as overweight (102).

In this study, consistent results were obtained with these studies (101 - 103). Only 3 mothers (1.6%) thought their children were overweight, but 75 children were overweight or obese. On the other hand, there was a significant relationship between child's BMI percentile and the mother's thoughts if their children has excessive weight ($t = 7.954$; $p = 0.001$). Mothers with higher BMI are may embarrassed that their children are overweight because they are dealing with weight problems and cannot accept that their children are overweight. Or being overweight may be more normal for mothers with

higher BMI, so they may perceive the weight status of their overweight children as normal.

The stress factor has very significant and effective in every stage of human life. Biological and behavioral interactions that stress in childhood can increase the risk of obesity. Food consumption cope with stress is quite common, and these behaviors can become habitual in long period (61). Parental stress has been also associated with childhood obesity. In this relationship included that increasing inactivity, decreasing physically active, watching TV to keep the child engaged (104, 105).

In this study, 27.5% of mothers thought that there was stressed in their children's life. This result may be due to the mothers thinking that they can provide sufficient opportunities for their children since the schools studied are private schools and parents whose wealth level is average and above. On the other hand, there was no significant relationship between child's BMI percentile and stress status ($t=0.323$; $p=0.747$) and maternal educational status on child nutrition ($t=-0.260$; $p=0.795$). The stress was evaluated with the mention of the mothers thus as it is very subjective, stress should be deeply and objectively pointed out in further studies.

In childhood, stress factors has associated with physically active, watching TV and sleep time. All these factors may have an effect on childhood obesity. The fact that children are physically active has known to have a preventive factor from obesity. Physically active positively affects growth and development in early childhood. Parents has plays an effective role on children's physically active levels (52, 56, 106). Armoon et al. found that children of mothers with low physically active can significantly improve the likelihood of developing obesity in childhood (28). Alberdi et al. have said that if children aged 0-5 are not childcare by their parents, excessive weight gain may increase because people other than parents can cause children to move less physically active and eat unhealthily (107).

In TBSA 2010 data, the average duration spent by children between 2-5 years for sedentary activity during weekdays has shown as 3.46 hours. In addition, duration spent

for sedentary activity on weekend has found to be similar to that of weekdays (22). In this study, 81.8% of the children were found to be physically active for more than 3 hours a day. There was no significant relationship between child's BMI percentile and physically active duration ($F=0.578$; $p=0.562$).

There is a relationship between watching TV and physically active level. As the time spent in front of the television increases, the movement of the child will be decreased and therefore he/she will be more sedentary. Watching television is an influencing factor on childhood obesity. Yılmazbaş et al. has shown that every 1 hour spent in front of a screen increases the risk of being obese in adulthood by 7% (26). According to results of a study conducted in China, watching TV for more than 1 hour has positively associated with unhealthy behavior (56). Studies shown that watching TV will increase obesity as it will reduce child's activity, less energy expenditure and increase snack consumption (108, 109). In this study, it was observed that daily TV watching time of children was between 30-60 minutes a day with 44%, 60 minutes or more a day with 29%. Followed these results, 21.8% of the children did not watch 30 minutes a day and 5.2% did not watch at all. There was a significant relationship between child's BMI percentile and daily TV watching time ($F=3.296$; $p= 0.022$, <0.05). Post-Hoc Tukey analyses showed that there was a significance difference between the groups 30 min/day and >60min/day.

The main factor that has to be considered here is the watching time because as the duration spent in front of television increased, the risk of childhood obesity increased in tendency same direction. Studies suggest that children need a regular nutrition and healthy eating behavior. They are advised creating necessary conditions while eating, eliminate distracting factors such as TV and encourage children to sit at the dinner table (6, 110). Watching TV while eating has an effect on food preferences by causing children to want food they see on the screen. Ersoy and Özbaş found that advertisements have an effective factor in children's food consumption (111). Similarly, a review has found a strong connection between childhood obesity and food marketing (112). In this study, 68.4% of the children were found to have snacks while watching TV. It was observed that among snack preferences, fruit and vegetable was the most common answer with 64.6%. Subsequently, it was observed that they preferred 36.2% nuts, 36.2% instant fatty snacks, 20.0% homemade snacks, and 10.0% milk and milk product. In addition, it was observed

that 6.2% of the children ate their main meals in front of the TV. There was no significant relationship between child's BMI percentile and snacking while watching TV ($t=1.283$; $p=0.201$).

According to results of a study conducted on Dutch children between 2-6 aged children, it was found that children mostly consume snacks fruit, cookies and sugar. Also it was found that one in seven children is overweight or obese in this study (113). Similarly, Damen et al. found that according to the choice of snacks given to their children by mothers, fruits were given maximum with 28%, followed by cookies with 20% and sweets with 17% (114).

Children often reflect the eating pattern of home environment because they consume food that they observed from their parents consumption and that their parents provide (115). An example in a study was that the higher consumption of vegetables and fruits of the parents had a potential for higher consumption of their children (116). There is a relation between the snacking preferences of children especially young ones and their mothers because mothers have given their children the snacks that they choose themselves (117, 118). Mothers first correcting their own diet on this issue can help reduce the risk of childhood obesity by feeding their children correctly.

There are many factors that affect maternal choice of snacks on their children, one of which is the mother's education level. According to a study conducted in Norway, mothers with a higher education level are more likely to increase their children's fruit consumption or reduce their sugary beverage consumption (119). Although the choice of snacks that mothers give to their children varies according to cultures, there is a consensus that it is generally healthy, while some mothers may prefer some food such as being a popular brand, easily prepared, natural and organic. Some mothers have been taking into consideration snacks their children prefer when giving snacks to their children (114). Conversely according to a qualitative study it was found most of parents were flexible about what, when and where they wanted to eat snacks (120). In a study, it was observed that if mothers gave snack preference to their children their children preferred more high-energy snacks (121). This may have an effect on the increase in childhood obesity. Dietary quality is associated with snacks and, consuming high-energy-density snack

foods is related with lower overall dietary quality and higher intake of added sugar and saturated fats among preschoolers (122). The most preferred snack in this study is fruit categorized as healthy. While the consumption of snacks was not effective in children being overweight, the consumption of unhealthy snacks was found to be effective on excess body weight.

Reilly et al. have found a very strong relationship between parental and childhood obesity. When only one parent was obese, the risk of obesity at age 7 was increased and, the odds ratio for childhood obesity was found be greater than 10 for those with both obese parents, and over 4 if only the mother was obese (123). These results may help explain how parents' own diets and child-feeding practices have an impact on their children.

There is a relationship between parental feeding styles and childhood obesity. About child feeding practices, restricting a child from eating unhealthy or snack foods was related to overweight, whereas pressuring a child to eat during feeding was related to weight gain. Child feeding practices show parents' attitudes towards feeding their children and may have an impact on children's eating habits. Since kindergarten age children are generally dependent on their mothers in terms of nutrition, attitudes and behaviors of mothers are important for this age children (124, 125-127). An example, more stress in employed mothers may also affect the nutrition of their children. Increasing maternal stress and anxiety may lead to restrictive feeding practices (128, 129). The increase in maternal psychological distress was observed to reach higher 'restriction' and 'monitoring' feeding practices in children aged 1 year, and subsequently 'pressure to eat' feeding practices in children aged 2 year (130). Restrictive feeding practices mean regulating the type and amounts of foods eaten by children. Mothers who perceive their child as overweight show higher levels of restriction and monitoring and show lower levels of using food to regulate the child's emotions and pressure to eat. Although parents generally use restrictive feeding practices to reduce their children's body weight and protect their health while using restrict children to seek out restricted foods and failing to help children regulate eating based on satiety (131-134). On the other hand, parents who perceive their children as underweight may use 'pressure to eat' feeding practices in their children (135). Sleddens et al. in preschoolers was found parents who are not concerned

about their child's weight report less restrictive feeding practices than parents who are concerned about child's weight than parents (136).

Rodriguez et al. according to the study result, 1 out of every 3 parents (32.9%) misclassified their child's body weight and misperceived their child's weight (137). Misperception of body weight by parents may be associated with an increase in childhood obesity. Parents of overweight or obese children misrepresenting their children despite knowing their body weight status may result from embarrassment or their inability to admit that their children have weight problems. Or they may want to avoid labeling from others their children as obese. Especially overweight mothers predicted the body weight status of their children less than normal weight parents. Similarly, Manios et al. found that 38% of the mothers of children between the ages of 2 and 5 have shown that they misclassify their child's weight as lower than its current weight (138). According to another systematic review, 32.9% of 35,103 children were found to be overweight. While 37.6% of the parents of these children perceived their children as overweight, 62.4% perceived them as normal. Especially, 86% of the parents of children between aged of 2 and 6 perceive their children's weight incorrectly (139). In a study conducted on Latin mothers, 100% of the mothers of low-weighted children and 70% of the mothers of normal weighted children correctly predicted weight of their children. 3% of the mothers of overweight or obese children estimated their children's weight correctly and the remaining 97% stated that their children had average body weight status (140).

In this study, when the CFQ sub-dimension scores were evaluated, perceived child weight mean score, which is one of the sub-dimensions of the CFQ, showed a significant difference according to the child BMI groups ($F(3,187): 3.989, p \leq 0.05$). Perceived child weight mean score of children with overweight BMI was significantly higher than the mean score of children with normal BMI.

As a result of our study, it was found that childhood obesity was affected by some factors in accordance with the purpose of the study. Preschool children have important and strong connection with their mothers and, the child is often attached to mother. Mothers' child feeding practices and their own weight status are relationship with childhood obesity. Especially misperceived child weight can increase the risk of the child

being overweight or obese. Television watching and snack preferences, which are thought to be among the other factors associated with obesity, were also found to be associated with childhood obesity according to the results of this study. Increasing the duration of watching television causes the child to stay physically inactive, consume snacks and decrease energy expenditure, thus increasing the BMI percentile value of the child. Future studies can examine in detail whether being inactive or advertising and the food industry, are more effective on the child's weight gain than increasing the time spent in front of the screen.

Obesity is a problem associated with other chronic diseases and its prevalence is increasing. Its prevention in childhood, will contribute to both health expenditures and raising healthy generations. We recommend future studies focusing on children aged between 2 to 6. Multi factors should be considered and evaluated in combating childhood obesity. Parents, especially mothers, play an important role. Interventions with parental involvement are recommended for the prevention of childhood obesity.

6. REFERENCES

- 1) Morales Camacho, W. J. Molina Díaz, J. M. Plata Ortiz, S. et al. Childhood obesity: Aetiology, comorbidities, and treatment. *Diabetes/metabolism research and reviews*, 2019. 35(8): e3203.
- 2) Sahoo, K. Sahoo, B. Choudhury, A. K. et al. Childhood obesity: causes and consequences. *Journal of family medicine and primary care*, 2015. 4(2): p. 187–192.
- 3) Pekcan, E. G. Şanlıer, N. Baş, M. Başoğlu, S. & Acar Tek, N. Türkiye beslenme rehberi 2015 (TÜBER). *Ankara: Sağlık Bakanlığı*, 2006.
- 4) Child Development. Centers for Disease Control and Prevention. Available from: <https://www.cdc.gov/ncbddd/childdevelopment/positiveparenting/preschoolers.html>
- 5) Britto, P. R. Lye, S. J. Proulx, K. et al. Advancing early childhood development: from science to scale 2 nurturing care: promoting early childhood development. *safety (eg, routines and protection from harm)*, 2016. 3: p. 4.
- 6) Özmert, E. N. Erken çocukluk gelişiminin desteklenmesi-I: Beslenme. *Çocuk sağlığı ve hastalıkları dergisi*, 2005. 48(1): p. 79-195.
- 7) Bergmeier, H. Paxton, S. J. Milgrom, J. et al. Early mother-child dyadic pathways to childhood obesity risk: A conceptual model. *Appetite*, 2020. 144, 104459.
- 8) Barrett, K. J. Thompson, A. L. & Bentley, M. E. The influence of maternal psychosocial characteristics on infant feeding styles. *Appetite*, 2016. 103: p. 396-402.
- 9) Frate, N. Jenull, B. & Foran, H. M. Overweight and Obesity in Early Childhood A Systematic Review of Individual, Family, and Peer Risk Factors. *Adv. Pediatr. Res*, 2018. 5: p. 1-20.
- 10) Dougherty, L. R. Leppert, K. A. Merwin, S. M. Smith, V. C. Bufferd, S. J. & Kushner, M. R. Advances and directions in preschool mental health research. *Child Development Perspectives*, 2015. 9(1): p. 14-19.
- 11) Motadi, S. A. Mbhenyane, X. G. Mbhatsani, H. V. Mabapa, N. S. & Mamabolo, R. L. Prevalence of iron and zinc deficiencies among preschool children ages 3 to 5 y in Vhembe district, Limpopo province, South Africa. *Nutrition*, 2015. 31(3): p. 452-458.

- 12) WHO. Early Child Development. Available from: <https://www.who.int/topics/early-child-development/child-nutrition/en/>
- 13) Küçükkömürler, S. Okul öncesi dönemde çocuğun beslenmesi. *Pegem Atıf İndeksi*, 2017. p. 171-192.
- 14) Döring, N. Ghaderi, A. Bohman, B. et al. Motivational interviewing to prevent childhood obesity: a cluster RCT. *Pediatrics*, 2016. 137(5).
- 15) Lobstein, T. Jackson-Leach, R. Moodie, M. L. et al. Child and adolescent obesity: part of a bigger picture. *The Lancet*, 2015. 385(9986): p. 2510-2520.
- 16) WHO. Global Strategy on Diet, Physical Activity and Health. Available from: https://www.who.int/dietphysicalactivity/childhood_diet/en/
- 17) Benjamin-Neelon, S. E. Position of the academy of nutrition and dietetics: Benchmarks for nutrition in child care. *Journal of the Academy of Nutrition and Dietetics*, 2018. 118(7): p. 1291-1300.
- 18) Ogata, B. N. & Hayes, D. Position of the academy of nutrition and dietetics: nutrition guidance for healthy children ages 2 to 11 years. *Journal of the Academy of Nutrition and Dietetics*, 2014. 114(8): p. 1257-1276.
- 19) Walker, J. L. Ardouin, S. & Burrows, T. The validity of dietary assessment methods to accurately measure energy intake in children and adolescents who are overweight or obese: A systematic review. *European journal of clinical nutrition*, 2018. 72(2): p. 185-197.
- 20) Koletzko, B. Godfrey, K. M. Poston, L. et al. Nutrition during pregnancy, lactation and early childhood and its implications for maternal and long-term child health: the early nutrition project recommendations. *Annals of Nutrition and Metabolism*, 2019. 74(2): p. 93-106.
- 21) Önal, S. Özdemir, A. Cansev, M. & Koca, B. Okulöncesi dönem çocuklarda malnütrisyon ve obezite prevelansının değerlendirilmesi: Ankara örneği. *Ankara Üniversitesi Dil ve Tarih-Coğrafya Fakültesi Dergisi*, 2016. 56(1).
- 22) Beslenme, H. Ü. S. B. F., & Bölümü, D. Türkiye Beslenme ve Sağlık Araştırması 2010. *Ankara, Sağlık Bakanlığı Yayınları*, 2010. p. 445-95.
- 23) Schwarzenberg, S. J. & Georgieff, M. K. Advocacy for improving nutrition in the first 1000 days to support childhood development and adult health. *Pediatrics*, 2018. 141(2).

- 24) Bhutta, Z. A. Berkley, J. A. Bandsma, R. H. Kerac, M. Trehan, I. & Briend, A. Severe childhood malnutrition. *Nature reviews Disease primers*, 2017. 3(1): p. 1-18.
- 25) Kumar, S. & Kelly, A. S. Review of childhood obesity: from epidemiology, etiology, and comorbidities to clinical assessment and treatment. In *Mayo Clinic Proceedings*, 2017. 92(2): p. 251-265.
- 26) Yılmazbaş, P. & Gökçay, G. Çocukluk Çağı Obezitesi ve Önlenmesi. *Çocuk Dergisi*, 2018. 18(3): p. 103-112.
- 27) Geserick, M. Vogel, M. Gausche, R. et al. Acceleration of BMI in early childhood and risk of sustained obesity. *New England Journal of Medicine*, 2018. 379(14): p. 1303-1312.
- 28) Armoon, B. & Karimy, M. Epidemiology of childhood overweight, obesity and their related factors in a sample of preschool children from Central Iran. *BMC pediatrics*, 2019. 19(1): p. 159.
- 29) Ek, A. Nordin, K. Nyström, C. D. Sandvik, P. Eli, K. & Nowicka, P. Responding positively to “children who like to eat”: Parents’ experiences of skills-based treatment for childhood obesity. *Appetite*, 2020. 145.
- 30) Boswell, N. Byrne, R. & Davies, P. S. Family food environment factors associated with obesity outcomes in early childhood. *BMC obesity*, 2019. 6(1): p. 17.
- 31) Ek, A. Sorjonen, K. Eli, K. Lindberg, L. et al. Associations between parental concerns about preschoolers’ weight and eating and parental feeding practices: results from analyses of the Child Eating Behavior Questionnaire, the Child Feeding Questionnaire, and the Lifestyle Behavior Checklist. *PloS one*, 2016. 11(1).
- 32) Hart, L. M. Damiano, S. R. Cornell, C. & Paxton, S. J. What parents know and want to learn about healthy eating and body image in preschool children: a triangulated qualitative study with parents and Early Childhood Professionals. *BMC Public Health*, 2015. 15(1): p. 596.
- 33) Moreira, I. Severo, M. Oliveira, A. et al. Social and health behavioural determinants of maternal child-feeding patterns in preschool-aged children. *Maternal & child nutrition*, 2016. 12(2): p. 314-325.
- 34) Lee, C. Y. Ledoux, T. A. Johnston, C. A. Ayala, G. X. & O’Connor, D. P. Association of parental body mass index (BMI) with child’s health behaviors and child’s BMI depend on child’s age. *BMC obesity*, 2019. 6(1): p. 11.

- 35) Farajian, P. Panagiotakos, D. B. Risvas, G. Malisova, O. Zampelas, A. Hierarchical analysis of dietary, lifestyle and family environment risk factors for childhood obesity: the GRECO study. *Eur J Clin Nutr*, 2014. 68: p.1107–12.
- 36) Liu, Y. Chen, H. J. Liang, L. Wang, Y. Parent-child resemblance in weight status and its correlates in the United States. *PLoS One*, 2013. 8.
- 37) Kosti, R. I. Panagiotakos, D. B. Tountas, Y. et al. Parental body mass index in association with the prevalence of overweight/obesity among adolescents in Greece; dietary and lifestyle habits in the context of the family environment: the Vyronas study. *Appetite*, 2008. 51: p. 218–22.
- 38) Dalrymple, K. V. Flynn, A. C. Seed, P. T. et al. Associations between dietary patterns, eating behaviours, and body composition and adiposity in 3-year-old children of mothers with obesity. *Pediatric Obesity*, 2020. 15(5).
- 39) Börnhorst, C. Siani, A. Russo, P. et al. Early life factors and inter-country heterogeneity in BMI growth trajectories of European children: the IDEFICS study. *PloS one*, 2016. 11(2).
- 40) Yabancı, N. Kısaç, I. & Karakuş, S. Ş. The effects of mother's nutritional knowledge on attitudes and behaviors of children about nutrition. *Procedia-Social and Behavioral Sciences*, 2014. 116(44): p. 77-81.
- 41) Jabakhanji, S. B. Boland, F. Ward, M. & Biesma, R. Body mass index changes in early childhood. *The Journal of pediatrics*, 2018. 202: p. 106-114.
- 42) Stuart, B. & Panico, L. Early-childhood BMI trajectories: evidence from a prospective, nationally representative British cohort study. *Nutr Diabetes*, 2016. 6:198.
- 43) Larqué, E. Labayen, I. Flodmark, C. E. et al. (2019). From conception to infancy—early risk factors for childhood obesity. *Nature Reviews Endocrinology*, 2019. 15(8): p. 456-478.
- 44) Flores-Barrantes, P. Iguacel, I. Iglesia-Altaba, I. Moreno, L. A. & Rodríguez, G. Rapid weight gain, infant feeding practices, and subsequent body mass index trajectories: The CALINA Study. *Nutrients*, 2020. 12(10): p. 3178.
- 45) Pecoraro, L. Agostoni, C. Pepaj, O. & Pietrobelli, A. Behind human milk and breastfeeding: not only food. *International journal of food sciences and nutrition*, 2018. 69(6): p. 641-646.

- 46) Horta, B. L. & Victora, C. G. Long-term effects of breastfeeding: a systematic review. 1º edição. Geneva: *World Health Organization*, 2013.
- 47) Portela, D. S. Vieira, T. O. Matos, S. M. Oliveira, N. F. & Vieira, G. O. Maternal obesity, environmental factors, cesarean delivery and breastfeeding as determinants of overweight and obesity in children: results from a cohort. *BMC pregnancy and childbirth*, 2015. 15(1): p. 94.
- 48) Yan, J. Liu, L. Zhu, Y. Huang, G. & Wang, P. P. The association between breastfeeding and childhood obesity: a meta-analysis. *BMC public health*, 2014. 14(1): p. 1267.
- 49) Romanelli, R. Cecchi, N. Carbone, M. G. et al. Pediatric obesity: prevention is better than care. *Italian Journal of Pediatrics*, 2020. 46(1): p. 1-7.
- 50) Tani, Y. Fujiwara, T. & Isumi, A. Home cooking and child obesity in Japan: Results from the A-CHILD study. *Nutrients*, 2019. 11(12): p. 28-59.
- 51) Lichtenstein, A. H. & Ludwig, D. S. Bring back home economics education. *Jama*, 2010. 303(18): p. 1857-1858.
- 52) Piercy, K. L. Troiano, R. P. Ballard, R. M. et al. The physical activity guidelines for Americans. *Jama*, 2018. 320(19): p. 2020-2028.
- 53) Braithwaite, I. Stewart, A. W. Hancox, R. J. et al. The world wide association between television viewing and obesity in Children and adolescents: cross sectional study. *PLoSOne*, 2013.
- 54) Rincón-Pabón, D. Urazán-Hernández, Y. & González-Santamaría, J. Association between the time spent watching television and the sociodemographic characteristics with the presence of overweight and obesity in Colombian adolescents (secondary analysis of the ENSIN 2010). *PLoSOne*, 2019. 14(5).
- 55) Kolehmainen, M. Harrison, G. G. Whaley, S. McGregor, S. Jenks, E. & Afifi, A. Preschool enrollment is associated with lower odds of childhood obesity among WIC participants in LA County. *Matern Child Health J*, 2012. 16: p. 706–12.
- 56) Hu, J. Ding, N. Yang, L. et al. Association between television viewing and early childhood overweight and obesity: a pair-matched case-control study in China. *BMC pediatrics*, 2019. 19(1): p. 184.
- 57) Helm, A. F. & Spencer, R. M. Television use and its effects on sleep in early childhood. *Sleep health*, 2019. 5(3): p. 241-247.

- 58) Zhang, Z. Sousa-Sá, E. Pereira, J. R. Okely, A. D. Feng, X. & Santos, R. Correlates of Sleep Duration in Early Childhood: A Systematic Review. *Behavioral Sleep Medicine*, 2020. p. 1-19.
- 59) Berry, D. Blair, C. Ursache, A. et al. Child care and cortisol across early childhood: Context matters. *Developmental psychology*, 2014. 50(2): p. 514.
- 60) Sumner, M. M. Bernard, K. & Dozier, M. Young children's full-day patterns of cortisol production on child care days. *Archives of pediatrics & adolescent medicine*, 2010. 164(6): p. 567-571.
- 61) Miller, A. L. & Lumeng, J. C. Pathways of association from stress to obesity in early childhood. *Obesity*, 2018. 26(7): p. 1117-1124.
- 62) WHO. Growth reference data for 5-19 years. Available from: <https://www.who.int/toolkits/growth-reference-data-for-5to19-years/application-tools>
- 63) WHO. Child growth standards. Available from: <https://www.who.int/toolkits/child-growth-standards/standards>
- 64) Overweight & Obesity. Centers for Disease Control and Prevention. Available from: <https://www.cdc.gov/obesity/adult/defining.html>
- 65) Corsini, N. Danthiir, V. Kettler, L. & Wilson, C. Factor structure and psychometric properties of the Child Feeding Questionnaire in Australian preschool children. *Appetite*, 2008. 51(3): p. 474-481.
- 66) Camcı, N. “Çocuk besleme anketi'nin (Child Feeding Questionnaire CFQ) geçerlilik ve güvenilirliğinin saptanması ve Türk ebeveynlerine uygulaması”. *Başkent Üniversitesi Sağlık Bilimleri Enstitüsü Yüksek Lisans Tezi*, 2010.
- 67) George, D. & Mallery, M. SPSS for windows step by step: a simple guide and reference, 17.0 update (10a ed.) Boston: Pearson, 2010.
- 68) Cunningham, S. A. Datar, A. Narayan, K. V. & Kramer, M. R. Entrenched obesity in childhood: findings from a national cohort study. *Annals of epidemiology*, 2017. 27(7): p. 435-441.
- 69) Rundle, A. G. Factor-Litvak, P. Suglia, S. F. et al. Tracking of obesity in childhood into adulthood: effects on body mass index and fat mass index at age 50. *Childhood Obesity*, 2020. 16(3): p. 226-233.

- 70) Freedman, D. S. Khan, L. K. Serdula, M. K. Dietz, W. H. Srinivasan, S. R. & Berenson, G. S. The relation of childhood BMI to adult adiposity: the Bogalusa Heart Study. *Pediatrics*, 2005. 115(1): p. 22-27.
- 71) Simmonds, M. Llewellyn, A. Owen, C. G. & Woolacott, N. Predicting adult obesity from childhood obesity: a systematic review and meta-analysis. *Obesity reviews*, 2016. 17(2): p. 95-107.
- 72) Yörüsün, T. Ö., Koçyiğit, E. K., İçer, M. A., Bozkurt, O., & Köksal, E. Okul Öncesi Çocukların Sağlıklı Besin Ve Aktivite Seçimleri ile Vücut Ağırlığı İlişkisi. *Gazi Sağlık Bilimleri Dergisi*, 2017. 2(3): p. 19-26.
- 73) Kaniogluları, A. O. Lefkoşa'da kreş ve anaokuluna devam eden çocukların beslenme davranışlarına ve vücut ağırlığına annenin çocuk besleme tutum ve davranışlarının etkisi. *Eastern Mediterranean University (EMU)-Doğu Akdeniz Üniversitesi (DAÜ), Yüksek lisans tezi*, 2015.
- 74) Köksal, G. & Özel, H. G. Okul Öncesi Dönemde Obezite. *TC Sağlık Bakanlığı Temel Sağlık Hizmetleri Genel Müdürlüğü Beslenme ve Fiziksel Aktiviteler Daire Başkanlığı Yayınları, Ankara*, 2008.
- 75) Moore, B. F. Harrall, K. K. Sauder, K. A. Glueck, D. H. & Dabelea, D. Neonatal adiposity and childhood obesity. *Pediatrics*, 2020. 146(3).
- 76) Eny, K. M. Chen, S. Anderson, L. N. et al. Breastfeeding duration, maternal body mass index, and birth weight are associated with differences in body mass index growth trajectories in early childhood. *The American journal of clinical nutrition*, 2018. 107(4): p. 584-592.
- 77) Usta, O. Ardiç, C. & Telatar, T. G. Preterm doğan çocuklarda ikinci ve üçüncü yaşta obezite değerlendirilmesi evaluation of obesity at second and third age in premature children. *Ankara Med J*, 2020. (3): p. 567-577.
- 78) Zarrati, M. Shidfar, F. Razmpoosh, E. et al. Does low birth weight predict hypertension and obesity in schoolchildren? *Ann Nutr Metab*, 2013. 63(1-2): p. 69-76.
- 79) Nor, N. S. M. Ariffien, A. R. Abidin, A. S. Z. Kamarudin, N. I. M. & Mohamad, J. Parental perception of children's weight status and sociodemographic factors associated with childhood obesity. *Medical Journal of Malaysia*, 2020. 75(3): p. 221-225.

- 80) Yu, Z. B. Han, S. P. Zhu, G. Z. Zhu, C. Wang, X. J. Cao, X. G. & Guo, X. R. Birth weight and subsequent risk of obesity: a systematic review and meta-analysis. *Obesity Reviews*, 2011. 12(7): p. 525-542.
- 81) Flores, G. & Lin, H. Factors predicting severe childhood obesity in kindergarteners. *International journal of obesity*, 2013. 37(1): p. 31-39.
- 82) Blair, A. MacGregor, E. & Lee, N. Childhood Obesity and Breastfeeding Rates in Pennsylvania Counties—Spatial Analysis of the Lactation Support Landscape. *Frontiers in Public Health*, 2020. 8: p. 123.
- 83) Qiao, J. Dai, L. J. Zhang, Q. & Ouyang, Y. Q. A meta-analysis of the association between breastfeeding and early childhood obesity. *Journal of Pediatric Nursing*, 2020. 53: p. 57-66.
- 84) Khan, J. R. Hossain, M. B. & Mistry, S. K. Breastfeeding is a protective factor for overweight/obesity among young children in Bangladesh: Findings from a nationwide data. *Children and Youth Services Review*, 2020. 119.
- 85) Breastfeeding: A smart investment. Unicef. Available from: <https://www.unicef.org/breastfeeding/>
- 86) Rossiter, M. D. Colapinto, C. K. Khan, M. K. McIsaac, J. L. D. Williams, P. L. Kirk, S. F. & Veugelers, P. J. Breast, formula and combination feeding in relation to childhood obesity in Nova Scotia, Canada. *Maternal and child health journal*, 2015. 19(9): p. 2048-2056.
- 87) Ünsür, E., Akıcı, N., & İsaçlı, D. K. Childhood obesity: Is it related to feeding type of the infant?. *Journal of Surgery and Medicine*, 2020. 4(11): p. 943-946.
- 88) Rogers, S. L. & Blissett, J. Breastfeeding duration and its relation to weight gain, eating behaviours and positive maternal feeding practices in infancy. *Appetite*, 2017. 108: p. 399-406.
- 89) Pluymen, L. P. et al. Early introduction of complementary foods and childhood overweight in breastfed and formula-fed infants in the Netherlands: the PIAMA birth cohort study. *European journal of nutrition*, 2018. 57(5): p. 1985-1993.
- 90) Bammann, K. Peplies, J. De Henauw, S. et al. Early life course risk factors for childhood obesity: the IDEFICS case-control study. *PLoSOne*, 2014. 9(2).
- 91) Karimy, M. Armoon, B. Fayazi, N. & Koohestani, H. R. A Study on the Knowledge, Attitude, and Practices of Iranian Mothers towards Childhood Obesity. *Obesity Facts*, 2019. 12(6): p. 669-677.

- 92) Lee, C. Y. Ledoux, T. A. Johnston, C. A. Ayala, G. X. & O'Connor, D. P. Association of parental body mass index (BMI) with child's health behaviors and child's BMI depend on child's age. *BMC obesity*, 2019. 6(1): 11.
- 93) Black, L. Matvienko-Sikar, K. & Kearney, P. M. The association between childcare arrangements and risk of overweight and obesity in childhood: a systematic review. *Obesity Reviews*, 2017. 18(10): p. 1170-1190.
- 94) Al-Shookri, A. Al-Shukaili, L. Hassan, F. Al-Sheraji, S. & Al-Tobi, S. Effect of mothers nutritional knowledge and attitudes on Omani children's dietary intake. *Oman medical journal*, 2011. 26(4): p. 253.
- 95) Aksoy, A. Oğur, S. & Aksoy Kendilci, E. Bitlis İli'ndeki obez çocuğa sahip ebeveynlerin obeziteye ve çocuklarına yaklaşımı. *Bitlis Eren Üniversitesi Fen Bilimleri Dergisi*, 2016. 5(2): p. 210, 24.
- 96) Farajzadeh-Moghanjoughi, N. Kheirouri, S. Alizadeh, M. & Farsad-Naeimi, A. Investigating the Maternal Factors Associated with Preschool Children's Food Preferences; A Cross-Sectional Study. *Galen Medical Journal*, 2019. 8: p. 1652.
- 97) Lohse, B. Rifkin, R. Arnold, K. et al. A digital program informs low-income caregivers of preschool-age children about family meals. *Journal of nutrition education and behavior*, 2012. 44(3): p. 256-261.
- 98) Lioret, S. McNaughton, S. A. Spence, A. C. et al. Tracking of dietary intakes in early childhood: the Melbourne infant program. *European journal of clinical nutrition*, 2013. 67(3): p. 275-281.
- 99) Göbel, P. Ebeveynlere verilen beslenme eğitiminin çocukların besin seçimine etkileri, *Doktora Tezi*, 2016.
- 100) Vallejo, M. Cortes-Rodríguez, B. A. & Colin-Ramirez, E. Maternal underestimation of child's weight status and health behaviors as risk factors for overweight in children. *Journal of pediatric nursing*, 2015. 30(6): p. 29-33.
- 101) Campbell, M. W. C. Williams, J. Hampton, A. & Wake, M. Maternal concern and perceptions of overweight in Australian preschool-aged children. *Medical journal of Australia*, 2006. 184(6): p. 274-277.
- 102) Baughcum, A. E. Chamberlin, L. A. Deeks, C. M. Powers, S. W., & Whitaker, R. C. Maternal perceptions of overweight preschool children. *Pediatrics*, 2000. 106(6): p. 1380-1386.

- 103) Ruiter, E. L., et al. Parents' underestimation of their child's weight status. Moderating factors and change over time: A cross-sectional study. *PloS one*, 2020. 15(1): p. e0227761.
- 104) Jang, M. Owen, B. & Lauver, D. R. Different types of parental stress and childhood obesity: A systematic review of observational studies. *Obesity Reviews*, 2019. 20(12): p. 1740-1758.
- 105) Suglia, S. F. Duarte, C. S. Chambers, E. C. & Boynton-Jarrett, R. Social and behavioral risk factors for obesity in early childhood. *Journal of developmental and behavioral pediatrics: JDBP*, 2013. 34(8): p. 549.
- 106) Bohnert, A. M., Loren, D. M., & Miller, A. L. Examining childhood obesity through the lens of developmental psychopathology: Framing the issues to guide best practices in research and intervention. *American Psychologist*, 2020. 75(2), 163.
- 107) Alberdi, G. McNamara, A. E. Lindsay, K. L. et al. The association between childcare and risk of childhood overweight and obesity in children aged 5 years and under: a systematic review. *European journal of pediatrics*, 2016. 175(10): p. 1277-1294.
- 108) Dennison, B. A. Erb, T. A. & Jenkins, P. L. Television viewing and television in bedroom associated with overweight risk among low-income preschool children. *Pediatrics*, 2002. 109(6): p. 1028-1035.
- 109) Do, L. M. Tran, T. K. Eriksson, B. Petzold, M. Nguyen, C. T. & Ascher, H. Preschool overweight and obesity in urban and rural Vietnam: differences in prevalence and associated factors. *Global health action*, 2015. 8(1).
- 110) Weihrauch-Blüher, S. Kromeyer-Hauschild, K. Graf, C. et al. Current guidelines for obesity prevention in childhood and adolescence. *Obesity facts*, 2018. 11(3): p. 263-276.
- 111) Ersoy, S. & Özbaş, S. Çocukların Gıda Tüketimi Üzerine Televizyon Reklamlarının Etkisi. *Akademik Gıda*, 2020. 18(2): p. 172-179.
- 112) Smith, R. Kelly, B. Yeatman, H. & Boyland, E. Food marketing influences children's attitudes, preferences and consumption: A systematic critical review. *Nutrients*, 2019. 11(4): p. 875.
- 113) Ocké, M. C. Van Rossum, C. T. M. Fransen, H. P. et al. Dutch national food consumption survey young children 2005/2006., 2008.

- 114) Damen, F. W. Luning, P. A. Fogliano, V. & Steenbekkers, B. L. What influences mothers' snack choices for their children aged 2–7. *Food Quality and Preference*, 2019. 74: p. 10-20.
- 115) Larsen, J. K. Hermans, R. C. Sleddens, E. F. How parental dietary behavior and food parenting practices affect children's dietary behavior. Interacting sources of influence?. *Appetite*, 2015. 89: p. 246-257.
- 116) Pearson, N. Timperio, A. Salmon, J. Crawford, D. & Biddle, S. J. Family influences on children's physical activity and fruit and vegetable consumption. *International Journal of behavioral nutrition and physical activity*, 2009. 6(1): p. 34.
- 117) Cawley, J. & Liu, F. Maternal employment and childhood obesity: A search for mechanisms in time use data. *Economics & Human Biology*, 2012. 10(4): p. 352-364.
- 118) Walsh, A. Meagher-Stewart, D. & Macdonald, M. Persistent optimizing: How mothers make food choices for their preschool children. *Qualitative Health Research*, 2015. 25(4): p. 527-539.
- 119) Bjelland, M. Brantsæter, A. L. Haugen, M. Meltzer, H. M. Nystad, W. & Andersen, L. F. Changes and tracking of fruit, vegetables and sugar-sweetened beverages intake from 18 months to 7 years in the Norwegian Mother and Child Cohort Study. *BMC public health*, 2013. 13(1): p. 793.
- 120) Loth, K. A. de Brito, J. N. Neumark-Sztainer, D. Fisher, J. O. & Berge, J. M. A qualitative exploration into the parent–child feeding relationship: How parents of preschoolers divide the responsibilities of feeding with their children. *Journal of nutrition education and behavior*, 2018. 50(7): p. 655-667.
- 121) Hepworth, A. D. Moding, K. J. & Stifter, C. A. A laboratory-based assessment of mother-child snack food selections and child snack food consumption: Associations with observed and maternal self-report of child feeding practices. *Food Quality and Preference*, 2020.
- 122) Kachurak, A. Bailey, R. L. Davey, A. Dabritz, L. & Fisher, J. O. Daily snacking occasions, snack size, and snack energy density as predictors of diet quality among US children aged 2 to 5 years. *Nutrients*, 2019. 11(7): p. 1440.
- 123) Reilly, J. J. Armstrong, J. Dorosty, A. R. Early life risk factors for obesity in childhood: cohort study. *Bmj*, 2005. 330(7504): p. 1357.

- 124) Hurley, K. M. Cross, M. B. & Hughes, S. O. A systematic review of responsive feeding and child obesity in high-income countries. *The Journal of nutrition*, 2011. 141(3): p. 495-501.
- 125) Anderson, P. M. Butcher, K. F. & Levine, P. B. Maternal employment and overweight children. *Journal of health economics*, 2003. 22(3): p. 477-504.
- 126) McLaren, L. Zarrabi, M. Dutton, D. J. Auld, M. C. & Emery, J. C. H. Child care: implications for overweight/obesity in Canadian children?. *Chronic diseases and injuries in Canada*, 2012. 33(1).
- 127) Bauer, K. W. Hearst, M. O. Escoto, K. Berge, J. M. & Neumark-Sztainer, D. Parental employment and work-family stress: associations with family food environments. *Social science & medicine*, 2012. 75(3): p. 496-504.
- 128) Mailey, E. L. & McAuley, E. Physical activity intervention effects on perceived stress in working mothers: the role of self-efficacy. *Women & health*, 2014. 54(6): p. 552-568.
- 129) Gemmill, A. W. Worotniuk, T. Holt, C. J. Skouteris, H. & Milgrom, J. Maternal psychological factors and controlled child feeding practices in relation to child body mass index. *Childhood obesity*, 2013. 9(4): p. 326-337.
- 130) Blissett, J. & Farrow, C. Predictors of maternal control of feeding at 1 and 2 years of age. *International Journal of Obesity*, 2007. 31(10): p. 1520-1526.
- 131) Stang, J. & Loth, K. A. Parenting style and child feeding practices: potential mitigating factors in the etiology of childhood obesity. *Journal of the American Dietetic Association*, 2011. 111(9): p. 1301-1305.
- 132) de Lauzon-Guillain, B. Musher-Eizenman, D. Leporc, E. Holub, S. & Charles, M. A. Parental feeding practices in the United States and in France: relationships with child's characteristics and parent's eating behavior. *Journal of the American Dietetic Association*, 2009. 109(6): p. 1064-1069.
- 133) Yilmaz, R. Erkorkmaz, Ü. Ozcetin, M. & Karaaslan, E. How does parents' visual perception of their child's weight status affect their feeding style?. *Nutricion hospitalaria*, 2013. 28(3): p. 741-746.
- 134) Webber, L. Hill, C. Cooke, L. Carnell, S. & Wardle, J. Associations between child weight and maternal feeding styles are mediated by maternal perceptions and concerns. *European journal of clinical nutrition*, 2010. 64(3): p. 259-265.

- 135) Boyington, J. A. & Johnson, A. A. Maternal perception of body size as a determinant of infant adiposity in an African-American community. *Journal of the National Medical Association*, 2004. 96(3): p. 351.
- 136) Sleddens, E. F. Kremers, S. P. Stafleu, A. Dagnelie, P. C. De Vries, N. K. & Thijs, C. Food parenting practices and child dietary behavior. Prospective relations and the moderating role of general parenting. *Appetite*, 2014. 79: p. 42-50.
- 137) Rodrigues, D. Machado-Rodrigues, A. M. & Padez, C. Parental misperception of their child's weight status and how weight underestimation is associated with childhood obesity. *American Journal of Human Biology*, 2020.
- 138) Manios, Y. Kondaki, K. Kourlaba, G. Vasilopoulou, E. & Grammatikaki, E. Maternal perceptions of their child's weight status: the GENESIS study. *Public health nutrition*, 2009. 12(8): p. 1099-1105.
- 139) Rietmeijer-Mentink, M. Paulis, W. D. van Middelkoop, M. Bindels, P. J. & van der Wouden, J. C. Difference between parental perception and actual weight status of children: a systematic review. *Maternal & child nutrition*, 2013. 9(1): p. 3-22.
- 140) Hidalgo-Mendez, J. Power, T. G. Fisher, J. O. O'Connor, T. M. & Hughes, S. O. Child weight status and accuracy of perceived child weight status as predictors of Latina mothers' feeding practices and styles. *Appetite*, 2019. 142.

7. APPENDIX

7.1. Preliminary Petition Form

28.11.2019

ÖZEL GÜNEK AĞACI ANAOKULU.....MÜDÜRLÜĞÜ'NE

Kurumunuzda "Anaokuluna giden 2-6 yaş arası çocukların annelerinin beslenme bilgi düzeylerinin ve obezite ile ilişkili diğer faktörlerin çocukların beden kütle indeksi üzerine etkisi" başlıklı yüksek lisans tez çalışmamın veri toplama formu kısmını etik kurul ve milli eğitim izni sonrası yapmayı talep ediyorum.

Bilginizi ve gereğini saygılarımla arz ederim.

Dyt. Sedef AYDIN

28/11/2019

Özel Göztepe Çilek Aşası Anaokulu MÜDÜRLÜĞÜ'NE

Kurumunuzda "Anaokuluna giden 2-6 yaş arası çocukların annelerinin beslenme bilgi düzeylerinin ve obezite ile ilişkili diğer faktörlerin çocukların beden kütle indeksi üzerine etkisi" başlıklı yüksek lisans tez çalışmamın veri toplama formu kısmını etik kurul ve milli eğitim izni sonrası yapmayı talep ediyorum.

Bilginizi ve gereğini saygılarımla arz ederim.

Dyt. Sedef AYDIN

04/12/2019

ÖZEL MARI G. FİJEN ANAOKULU MÜDÜRLÜĞÜ'NE

Kurumunuzda "Anaokuluna giden 2-6 yaş arası çocukların annelerinin beslenme bilgi düzeylerinin ve obezite ile ilişkili diğer faktörlerin çocukların beden kütle indeksi üzerine etkisi" başlıklı yüksek lisans tez çalışmamın veri toplama formu kısmını etik kurul ve milli eğitim izni sonrası yapmayı talep ediyorum.

Bilginizi ve gereğini saygılarımla arz ederim.

Dyt. Sedef AYDIN

05.12/2019

Özel...Yenilikçi...Öğrenme...İlkokul (Anasınıfı) MÜDÜRLÜĞÜ'NE

Kurumunuzda "Anaokuluna giden 2-6 yaş arası çocukların annelerinin beslenme bilgi düzeylerinin ve obezite ile ilişkili diğer faktörlerin çocukların beden kütle indeksi üzerine etkisi" başlıklı yüksek lisans tez çalışmamın veri toplama formu kısmını etik kurul ve milli eğitim izni sonrası yapmayı talep ediyorum.

Bilginizi ve gereğini saygılarımla arz ederim.

Dyt. Sedef AYDIN

7.2. Informed Consent Form

Değerli katılımcı ve yasal ebeveyni;

Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü Beslenme ve Diyetetik Bölümü'nden mezun olmak için yüksek lisans tez çalışmamı yapmaktayım. “**Anaokuluna giden 2-6 yaş arası çocukların annelerinin beslenme bilgi düzeylerinin ve obezite ile ilişkili diğer faktörlerin çocukların beden kütle indeksi üzerine etkisi**” başlıklı yüksek lisans tez çalışmamın veri toplama formu bölümüne katılmak üzere davet edilmiş bulunmaktasınız.

Bu çalışmada yer almayı kabul etmeden önce, çalışmanın ne amaçla yapılmak istendiğini anlamanız ve kararınızı bu bilgilendirme çerçevesinde özgürce vermeniz gerekmektedir.

Aşağıdaki bilgileri lütfen dikkatlice okuyunuz, sorularınız olursa sorunuz ve açık yanıtlar isteyiniz.

Bu çalışmada annenin beslenme bilgi düzeyinin ve çocukluk çağı obezitesinde etkili olabilecek değişkenlerin, çocuğun beden kütle indeksi üzerine etkisinin araştırılması amaçlanmıştır.

Çalışmanın bu kısmı için yalnızca veri toplama formunu doldurmanız yeterli olacaktır.

Gönüllülük esas olduğundan bu araştırmaya katılımınız isteğe bağlı olup, hiçbir şekilde katılma zorunluluğunuz asla bulunmamaktadır. Araştırmaya katılmış, veri toplama formu doldurmuş olsanız dahi istediğiniz zaman vazgeçme hakkına sahipsiniz. Araştırmaya katılmayı reddettiğiniz veya araştırmadan çekildiğinizde herhangi bir cezaya veya yaptırıma maruz kalmayacak, hiçbir hakkınızı kaybetmeyeceksiniz. Doldurduğunuz veri toplama formunun iptalini gerçekleştirmek istediğinizde aşağıdaki ilgili kişilerle iletişime geçebilirsiniz.

Ayrıca sizden alınan bilgilerin gizli tutulacağı, kamuoyuna açıklanmayacağı, araştırma sonuçlarının sadece bilimsel amaçla kullanılacağını tarafınıza beyan ederim.

Çalışmanın bu kısmında yer almayı kabul ediyorsanız lütfen aşağıdaki bölümü doldurunuz. Katıldığınız için şimdiden teşekkür ederim.

Lütfen aşağıda yazılmış olan cümleleri eksiksiz bir şekilde kendi el yazınız ile yazınız.

Bilgilendirilmiş gönüllü olur formundaki tüm açıklamaları okudum. Bana yukarıda konusu ve amacı belirtilen araştırma ile ilgili yazılı ve sözlü açıklama aşağıda adı belirtilen hekim tarafından yapıldı. Araştırmaya gönüllü olarak katıldığımı, istediğim zaman gerekçeli veya gerekçesiz olarak araştırmadan ayrılabileceğimi biliyorum.

Söz konusu araştırmaya, hiçbir baskı ve zorlama olmaksızın kendi rızamla katılmayı kabul ediyorum.

KATILIMCI VEYA YASAL EBEVEYNİNİN

Adı ve soyadı:

İmza:

Tarih:

SORUMLU ARAŞTIRMACININ

Adı ve soyadı: Binnur OKAN BAKIR

Telefon numarası: 0(216) 578 00 00-1657

Adres: Yeditepe Üniversitesi, İnönü Mah, Kayışdağı Cd. No:326A, 34755 Atasehir/İstanbul

İmza:

YARDIMCI ARAŞTIRMACININ

Adı ve soyadı: Sedef AYDIN

Telefon numarası: 0536 769 66 11

Adres: Z Fit Danışmanlık LTD. ŞTİ., Barbaros mah. Al Zambak sok. Varyap Meridian Sitesi A blok K:3 D:43 Atasehir/İSTANBUL

İmza:

7.3. Ethical Approval



Sayı : 37068608-6100-15- 1795
Konu: Klinik Araştırmalar
Etik kurul Başvurusu hk.

31/12/2019

İlgili Makama (Sedef Aydın)

Yeditepe Üniversitesi Sağlık Bilimleri Fakültesi Beslenme ve Diyetetik Dr. Öğr. Üyesi Binnur Okan Bakır'ın sorumlu araştırmacı olduğu **“Özel Anaokuluna Giden 2 – 6 Yaş Arası Çocukların Annelerinin Beslenme Bilgi Düzeylerinin ve Obezite İle İlişkili Diğer Faktörlerin Çocukların Beden Kütle İndeksi Üzerine Etkisi”** isimli araştırma projesine ait Klinik Araştırmalar Etik Kurulu (KAEK) Başvuru Dosyası **(1779)** kayıt Numaralı KAEK Başvuru Dosyası, Yeditepe Üniversitesi Klinik Araştırmalar Etik Kurulu tarafından **30.12.2019** tarihli toplantıda incelenmiştir.

Kurul tarafından yapılan inceleme sonucu, yukarıdaki isimi belirtilen çalışmanın yapılmasının etik ve bilimsel açıdan uygun olduğuna karar verilmiştir (**KAEK Karar No: 1139**).

7.4. Governorship Approval



T.C.
İSTANBUL VALİLİĞİ
İl Milli Eğitim Müdürlüğü

Sayı : 59090411-20-E.8279874
Konu : Anket ve Araştırma İzin Talebi.

23/06/2020

VALİLİK MAKAMINA

İlgi: a) Yeditepe Üniversitesinin bila tarihli ve 311 sayılı yazısı.
b) Bakanlığımızın 21.01.2020 tarih ve 1563890/ 2020/2 No'lu genelgesi
c) Müdürlüğümüz Araştırma ve Anket Komisyonunun 19.06.2020 tarihli tutanağı.

Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü Yüksek Lisans Öğrencisi Sedef AYDIN 'ın "Özel Anaokuluna giden 2-6 yaş arası çocukların annelerinin beslenme bilgi düzeylerinin ve obezite ile ilişkili diğer faktörlerin çocukların beden kütle indeksi üzerine etkisi" konulu tezine dair araştırma çalışmasını Özel Göztepe Çilek Ağacı Anaokulu, Özel Çilek Ağacı Anaokulu, Özel Mavi Gezegen Anaokulu ve Göztepe YÖM Okulları Görüşme Formu ve Çocuk Besleme Anketi uygulama isteği hakkındaki ilgi (a) yazı ve ekleri müdürlüğümüzce incelenmiştir.

Araştırmacının söz konusu talebi; bilimsel amaç dışında kullanılmaması, uygulama sırasında bir örneği müdürlüğümüzde muhafaza edilen mühürlü ve imzalı veri toplama araçlarının kurumlarımıza araştırmacı tarafından ulaştırılarak uygulanması, katılımcıların gönüllülük esasına göre seçilmesi, araştırma sonuç raporunun kamuoyuyla paylaşılması koşuluyla, okul idarelerinin denetim, gözetim ve sorumluluğunda, eğitim-öğretimi aksatmayacak şekilde ilgi (b) Bakanlık emri esasları dâhilinde uygulanması, sonuçtan Müdürlüğümüze rapor halinde (CD formatında) bilgi verilmesi kaydıyla Müdürlüğümüzce uygun görülmektedir.

Makamlarınızca da uygun görülmesi halinde olurlarınıza arz ederim.

Levent YAZICI
İl Milli Eğitim Müdürü

OLUR
23/06/2020
Dr. Hasan Hüseyin CAN
Vali a.
Vali Yardımcısı

Ek:
1- Genelge.
2- Komisyon Tutanağı.

Adres: İstanbul Milli Eğitim Müdürlüğü - Strateji Geliştirme Şb. Md.
Binbirdirek Mh. İzzet Öksüz Cd. No:1 Sultanahmet-Fatih/İstanbul
Elektronik Ağ: istanbul.meb.gov.tr
e-posta: ist.sgb34@gmail.com

Bilgi için: Aykut ÇELİK
Tel: 0 (212) 384 36 32
Faks: 0 ()

Bu evrak güvenli elektronik imza ile imzalanmıştır. <http://evrakoorgu.meb.gov.tr> adresinden a312-c09b-3522-8799-8376 kodu ile teyit edilebilir.

7.5. The Data Collection (Survey Part 1)

1. BÖLÜM BİLGİ FORMU

A) Demografik Özellikler:

- 1.Çocuğun doğum tarihi:
- 2.Çocuğun cinsiyeti:
- 3.Çocuğun beden ağırlığı (kg):
- 4.Çocuğun boyu (cm):

B) Ebeveynlere Ait Bilgiler

Anneye ait Bilgiler:

- 5.Doğum tarihi:
- 6.Beden ağırlığı (kg):
- 7.Boy (cm):
- 8.Eğitim düzeyi: A) İlkokul veya ortaokul B) Lise C) Üniversite D) Yüksek lisans ve üzeri yükseköğretim
- 9.Çalışma durumu: A) Çalışıyor B) Çalışmıyor

Babaya Ait Bilgiler:

- 10.Doğum tarihi:
- 11.Beden ağırlığı (kg):
- 12.Boy (cm):
- 13.Eğitim düzeyi: A) İlkokul veya ortaokul B) Lise C) Üniversite D) Yüksek lisans ve üzeri yükseköğretim
- 14.Çalışma durumu: A) Çalışıyor B) Çalışmıyor

C) Diğer Bilgiler

- 15.Gebelik yaşı:
- 16.Bebekğin doğum süresi: A) <33 hafta B) 33-36 hafta C) 37-41 hafta D) 42 + hafta
- 17.Bebekğin doğum ağırlığı: A) 2500 gram> B) 2500-4000 gram C) >4000 gram
- 18.Emzirme süresi: A) Hiç B) 3 aydan az C) 3-6 ay D) 6 aydan fazla
- 19.Çocuğunuz hiç formula (mama) kullandı mı?: A) Evet B) Hayır
- 20.Çocuğun katı gıdaya geçiş süresi: A) 4 aydan az B) 4-6 aydan az C) 6 ay veya daha fazla
- 21.Evde yemek pişiriyor musunuz?: A) Evet B) Hayır
- 22.Evde ne sıklıkla yemek pişiriyorsunuz? A) Ayda birkaç kez B) Haftada birkaç kez C) Her gün

- 23.Çocuğun fiziksel aktivite süresi: A) 3 saatten az B) 3 saatten fazla
- 24.Çocuğun günlük uyku süresi: A) 12 saatten az B) 12- 14.9 saat arası C) 15 saat ve daha fazla
- 25.Çocuğun günlük tv izleme süresi: A) Hiç b) Günde 30 dk. c) 30 - 60 dk. arası d) 60 dk. dan fazla
- 26.Çocuğunuz televizyon izlerken atıştırma ihtiyacı duyuyor mu?: A) Evet B) Hayır
- 27.Çocuğunuz televizyon izlerken en sık ne gibi atıştırmalıklar tercih ediyor?:
- 28.Sizce çocuğunuzun hayatında stres var mı?: A) Evet B) Hayır
- 29.Sizce çocuğunuz aşırı kilolu mu? A) Evet B) Hayır
- 30.Çocuk beslenmesi konusunda herhangi birinden/bir yerden bilgi veya eğitim aldınız mı?
A) Evet B) Hayır

7.6. Child Feeding Questionnaire (Survey Part 2)

2. BÖLÜM ÇOCUK BESLEME ANKETİ

1	Çocuğunuz evde olduğunda, onu beslemek için ne sıklıkla kendinizi sorumlu hissedersiniz?	1=Hiç 2=Nadiren 3=Genellikle 4=Çoğunlukla 5=Her zaman
2	Çocuğunuzun yediklerinin porsiyon büyüklüğüne karar verirken ne sıklıkla kendinizi sorumlu hissedersiniz?	1=Hiç 2=Nadiren 3=Genellikle 4=Çoğunlukla 5=Her zaman
3	Çocuğunuzun doğru besinler tüketip tüketmediğine karar verirken ne sıklıkla kendinizi sorumlu hissedersiniz?	1=Hiç 2=Nadiren 3=Genellikle 4=Çoğunlukla 5=Her zaman
4	Siz çocukluk çağınızda (5-10 Yaş)	1=Çok zayıfım 2=Zayıfım 3=Normaldim 4=Hafif şişmandım 5=Çok şişmandım
5	Siz ergenlik çağınızda	1=Çok zayıfım 2=Zayıfım 3=Normaldim 4=Hafif şişmandım 5=Çok şişmandım
6	Siz 20'li yaşlarınızda	1=Çok zayıfım 2=Zayıfım 3=Normaldim 4=Hafif şişmandım 5=Çok şişmandım
7	Siz şu an	1=Çok zayıfım 2=Zayıfım 3=Normaldim 4=Hafif şişmandım 5=Çok şişmandım
8	Çocuğunuzun 0-1 yaşındaki ağırlığı	1=Çok zayıfı 2=Zayıfı 3=Normaldi 4=Hafif şişmandı 5=Çok şişmandı
9	Çocuğunuzun yürümeye başladığındaki ağırlığı	1=Çok zayıfı 2=Zayıfı 3=Normaldi 4=Hafif şişmandı 5=Çok şişmandı
10	Çocuğunuzun okul öncesi dönemdeki ağırlığı	1=Çok zayıfı 2=Zayıfı 3=Normaldi 4=Hafif şişmandı 5=Çok şişmandı

11	Çocuğunuz yanınızda olmadığında, onun çok fazla yemesi ile ne kadar ilgilisiniz?	1=İlgisizim 2=Biraz ilgisizim 3=İlgiliyim 4=Oldukça ilgililiyim 5=Çok ilgililiyim
12	Çocuğunuzun ideal ağırlığını koruyabilmesi için, beslenme biçimiyle ne kadar ilgiliniz?	1=İlgisizim 2=Biraz ilgisizim 3=İlgiliyim 4=Oldukça ilgililiyim 5=Çok ilgililiyim
13	Çocuğunuzun şişmanlaması ile ne kadar ilgilisiniz?	1=İlgisizim 2=Biraz ilgisizim 3=İlgiliyim 4=Oldukça ilgililiyim 5=Çok ilgililiyim
14	Çocuğumun çok fazla şekerleme (şeker, dondurma, pasta vb.) yemediğinden emin olmak zorundayım.	1=Katılmıyorum 2=Biraz katılmıyorum 3=Kararsızım 4=Biraz katılıyorum 5=Katılıyorum
15	Çocuğumun aşırı yağlı yiyecekler yemediğinden emin olmak zorundayım.	1=Katılmıyorum 2=Biraz katılmıyorum 3=Kararsızım 4=Biraz katılıyorum 5=Katılıyorum
16	Çocuğumun çok sevdiği yiyecekleri yemediğinden emin olmak zorundayım.	1=Katılmıyorum 2=Biraz katılmıyorum 3=Kararsızım 4=Biraz katılıyorum 5=Katılıyorum
17	Bazı yiyecekleri çocuğumun ulaşacağı yerlerden bilerek uzak tutarım.	1=Katılmıyorum 2=Biraz katılmıyorum 3=Kararsızım 4=Biraz katılıyorum 5=Katılıyorum
18	İyi bir davranış karşılığında şekerlemeleri (şeker, dondurma, pasta vb.) çocuğuma ödül olarak sunarım.	1=Katılmıyorum 2=Biraz katılmıyorum 3=Kararsızım 4=Biraz katılıyorum 5=Katılıyorum
19	İyi bir davranış karşılığında çocuğuma sevdiği yiyecekleri teklif ederim.	1=Katılmıyorum 2=Biraz katılmıyorum 3=Kararsızım 4=Biraz katılıyorum 5=Katılıyorum

20	Eğer çocuğumun beslenmesini düzenlemezsem veya ona yol göstermezsem, çocuğum çok fazla abur cubur yer.	1=Katılmıyorum 2=Biraz katılmıyorum 3=Kararsızım 4=Biraz katılıyorum 5=Katılıyorum
21	Eğer çocuğumun beslenmesini düzenlemezsem veya ona yol göstermezsem, çocuğum en sevdiği yiyecekleri çok fazla yer	1=Katılmıyorum 2=Biraz katılmıyorum 3=Kararsızım 4=Biraz katılıyorum 5=Katılıyorum
22	Çocuğum her zaman tabağındaki yiyeceklerin hepsini yemelidir.	1=Katılmıyorum 2=Biraz katılmıyorum 3=Kararsızım 4=Biraz katılıyorum 5=Katılıyorum
23	Çocuğumun yeterince yediğinden emin olmak için özellikle dikkatli olmak zorundayım.	1=Katılmıyorum 2=Biraz katılmıyorum 3=Kararsızım 4=Biraz katılıyorum 5=Katılıyorum
24	Çocuğum aç olmadığını söylese de, yemek yemesi için ısrar ederim.	1=Katılmıyorum 2=Biraz katılmıyorum 3=Kararsızım 4=Biraz katılıyorum 5=Katılıyorum
25	Çocuğumun yiyeceklerini düzenlemezsem veya on ayol göstermezsem, çocuğum gerekenden daha az yer.	1=Katılmıyorum 2=Biraz katılmıyorum 3=Kararsızım 4=Biraz katılıyorum 5=Katılıyorum
26	Çocuğunuzun tükettiği şekerli yiyecekleri (şeker, dondurma, pasta vb.) ne kadar takip edersiniz?	? 1=Hiç 2=Nadiren 3=Bazen 4=Çoğunlukla 5=Her zaman
27	Çocuğunuzun tükettiği atıştırmalık yiyecekleri (cipsler, doritos vb.) ne kadar takip edersiniz?	1=Hiç 2=Nadiren 3=Bazen 4=Çoğunlukla 5=Her zaman
28	Çocuğunuzun tükettiği aşırı yağlı yiyecekleri ne kadar takip edersiniz?	1=Hiç 2=Nadiren 3=Bazen 4=Çoğunlukla 5=Her zaman

7.7. Permission



7.8. Curriculum Vitae

Personal Informations

Name	Sedef	Surname	AYDIN
Place of Birth		Date of Birth	
Nationality		TR ID Number	
E-mail		Phone Number	

Education

Degree	Department	The name of the Institution Graduated From	Graduation Year
Doctorate			
Master	Department of Nutrition and Dietetics	Yeditepe University, Istanbul	2021
University	Department of Nutrition and Dietetics	Bahçeşehir University, Istanbul	2017
High School	Science and Math	Private Final Anatolian High School, Bursa	2013

All the grades must be listed if there is more than one (KPDS, ÜDS, TOEFL; EELTS vs),

Languages	Grades (#)
English	Good
German	Basic

Work Experience (Sort from present to past)

Position	Institute	Duration (Year-Year)
Dietician	Z Fit Danışmanlık LTD. ŞTİ.	2017- Ongoing

Computer Skills

Program	Level
Microsoft Office Programs	Excellent
SPSS	Basic
BEBIS	Basic

*Excellent , good, average or basic

Scientific

works

The articles published in the journals indexed by SCI, SSCI, AHCI

Articles published in other journals

Proceedings presented in international scientific meetings and published in proceedings book.

Journals in the proceedings book of the refereed conference / symposium

Others (Projects / Certificates / Rewards)
