

T.C.
YEDİTEPE UNIVERSITY
INSTITUTE OF HEALTH SCIENCES
DEPARTMENT OF NUTRITION AND DIETETICS

**FACTORS AFFECTING THE ADHERENCE TO
DIETARY RECOMMENDATIONS OF CHILDREN
AGED 2 - 5 YEARS WHO APPLIED TO A PRIVATE
CHILD HEALTH AND DISEASES CLINIC IN İZMİR**

MASTER THESIS

DYT. RAKEL RİTAL ALALUF

İSTANBUL - 2021

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İSTANBUL – 2021

THESIS APPROVAL FORM

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Programme : Department of Nutrition and Dietetics
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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 and numbered

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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.

Dyt. Rakel Rital Alaluf

DEDICATION

I dedicate my thesis to Avram MAÇA, my decedent grandfather.

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LIST OF SYMBOLS AND ABBREVIATIONS

AAP	American Academy of Pediatrics
ALSPAC	The Avon Longitudinal Study of Parents and Children
BMI	Body Mass Index
ESPGHAN	European Society for Pediatric Gastroenterology Hepatology and Nutrition
FFQ	Food Frequency Questionnaire
SES	Socioeconomic Status
TBSA	Turkey Nutrition and Health Survey (Türkiye Beslenme ve Sağlık Araştırması)
TÜBER	Turkey Dietary Guideline (Türkiye Beslenme Rehberi)
USDA	United States Departments of Agriculture
WHO	World Health Organization

ABSTRACT

Alaluf, R.R. (2021). Factors Affecting The Adherence to Dietary Recommendations of Children Aged 2 to 5 Years Who Applied to a Private Child Health And Diseases Clinic in İzmir. Yeditepe University, Institute of Health Science, Department of Nutrition and Dietetics, MSc thesis, İzmir. This study was conducted to determine the factors affecting adherences to dietary recommendations of 2 to 5 years old children. Food Frequency Questionnaire, Data Collection Form and Parent Mealtime Action Scale were used. Turkey Dietary Guidelines was used as a reference. Adherences to recommendations for each food group along with ‘total dietary recommendations’ were analyzed. Of the 132 children, 47.7 % were in poor adherence, 49.2% in good adherence and 3.0 % in excessive intake group. Children with good adherence to dietary recommendations had higher BMI while children with poor adherence were underweight ($p=0.037$). Children with older sibling ($p=0.047$) and children having less frequency of eating in front of the screen ($p=0.005$) had good adherence. Proportion of finding the information obtained from pediatrician as useful ($p=0.042$) and “daily fruit and vegetable availability” was higher ($p=0.046$) in parents of children having good adherence. “Use of rewards” ($p=0.008$) and “special meals”($p=0.018$) was found to be higher for parents of children in poor adherence group. As a conclusion, this study shows that some of the child and familial characteristics, infant nutrition, information sources and child feeding practices have an impact on adherence to dietary recommendations. In consideration of this study, caregivers should be educated by the health care providers about these practices.

Key words: TUBER, Preschool children, Adherence to dietary recommendations, Infant nutrition, Child feeding practices

ÖZET

Alaluf, R. R. (2021). İzmir’de Özel bir Çocuk Sağlığı ve Hastalıkları Kliniği’ne Başvuran 2-5 Yaş Grubu Çocukların Beslenme Durumunu Etkileyen Faktörler. Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü, Beslenme ve Diyetetik Bölümü Master Tezi. İzmir. Bu çalışma, 2-5 yaş grubundaki çocukların beslenme önerilerine uyumluluklarını etkileyen faktörleri araştırmak amacıyla gerçekleştirilmiştir. Besin Tüketim Sıklığı Anketi, Veri Toplama Formu ve Ebeveyn Yemek Zamanı Davranışları Ölçeği kullanılmıştır. Referans olarak, Türkiye Beslenme Rehberi kullanılmıştır. Tüm besin gruplarının yanında ‘toplam diyet önerilerine olan uyumluluk’ analiz edilmiştir. Toplam diyet önerilerine uyum açısından, 132 çocuktan %47,7’si zayıf uyum, % 49,2’ si iyi uyum ve % 3,0’ü aşırı alım grubunda sınıflandırılmıştır. Beslenme önerilerine iyi uyan çocuklar daha yüksek Beden Kütle İndeksi’ne sahipken, uyumu zayıf olan çocuklar düşük kilolu bulunmuştur ($p = 0,037$). Büyük kardeşi olan çocuklar ($p = 0,047$) ve ekran önünde yeme sıklığı daha az olan çocuklar ($p = 0,005$) anlamlı derecede iyi uyuma sahiptir. Beslenme önerilerine uyumu iyi olan çocukların ebeveynlerinde çocuk doktorundan alınan bilgileri yararlı bulma ($p = 0,042$) ve “günlük meyve ve sebze seçenekleri” oranı daha yüksektir ($p = 0,046$). “Ödül kullanımı” ($p = 0.008$) ve “özel yemekler” ($p = 0.018$) uyum düzeyi düşük gruptaki çocukların ebeveynlerinde daha yüksek bulunmuştur. Sonuç olarak bu çalışma; bazı karakteristik ve ailesel özelliklerin, bebek beslenmesinin, kullanılan bilgi kaynaklarının ve çocuk besleme davranışlarının çocuğun verilen beslenme önerilerine uygunluğunu etkilediğini göstermektedir. Bu çalışmadan elde edilen sonuçlar ışığında, bakım verenler bu uygulamalar hakkında sağlık hizmeti verenler tarafından eğitilmelidir.

Anahtar kelimeler: TÜBER, Okul öncesi çocuklar, Beslenme önerilerine uyum, Bebek beslenmesi, Çocuk besleme davranışları

1. INTRODUCTION AND PURPOSE

Healthy diet is important to support healthy growth and cognitive development, promote health and prevent chronic diseases through childhood, adolescence and adulthood (1). Healthy diet during infancy and childhood is especially important because it helps to prevent from both undernutrition and overnutrition which can cause impairments in growth and development. Moreover, risk of developing chronic diseases begins in fetal life and continues cumulatively. Establishing a healthy diet throughout the life is essential for reducing the risk of noncommunicable diseases such obesity, cardiovascular disease, diabetes mellitus, some types of cancer, hypertension and stroke (2). In addition, consistency between the food preferences and intake across the life span shows that food preferences of children may have an impact on food preferences in adulthood (3-6).

Turkey Nutrition and Health Survey (Türkiye Beslenme ve Sağlık Araştırması - TBSA) which was conducted in 2010 showed that 16% of children between 2 to 5 years of age were overweight and 10% of children were obese (7). Childhood obesity is related with breathing difficulties, increased risk of fractures, hypertension, early markers of cardiovascular diseases, insulin resistance and psychological effects (8). Furthermore, childhood obesity increases the risk of becoming obese in adulthood (8, 9). So, increase in the prevalence of overweight and obesity among children becomes a concern and special attention should be given to prevent childhood obesity.

However, meeting the nutritional requirements is a global problem (10-13). Similarly, according to TBSA, sugar, salt and saturated fat consumption were above while milk and dairy products, meat, chicken, fish, egg, legumes, seeds and nuts were below the recommended levels among children in Turkey (7).

As a result of this information, assessing and analyzing the factors contributing to the food intake of children is important. Infant nutrition has a significant role in children's health. Breastfeeding may affect the food preferences (14-16) thus food intake (17, 18) of children alongside with its benefits on child and mother's health (13). Moreover, complementary feeding period is an important and influential stage for children since it is the period which they are introduced to solid foods for the first time (19). Infants and

children are dependent to their families. So, familial factors influence child's food intake as well. Mothers are the primary caregiver of the child, so characteristics and feeding practices of mothers has an impact on diet of the child. Preschool aged children spend their most of the time at home. Home environment such as television viewing and mealtime habits shapes eating behavior therefore, food intake of children. Identifying these factors will raise awareness of families on the importance of breastfeeding, complementary feeding and child feeding practices.

The aim of this study is assessing the food intake of children aged 2 to 5, comparing it to the recommendations of Turkey Dietary Guideline (Türkiye Beslenme Rehberi – TÜBER) and associating the adherence to recommendations with multiple factors such as child's body mass index (BMI), age, gender, parent's educational status, maternal age, used information sources on child nutrition, number of siblings, parental BMI, exclusive breastfeeding duration, total duration of breastfeeding, time of introducing complementary foods, screen time, frequency of family dinners, TV exposure during meal time and parents' child feeding styles. Hypothesis of this study is that; child's characteristics, parental characteristics, infant nutrition, social environment of the house and parental feeding practices have and impact on food intake of children aged 2 to 5.

2. LITERATURE REVIEW

2.1 Healthy Diet

2.1.1. Healthy Diet Recommendations for Children Aged 2 to 5 years in Turkey

Ministry of Health of Turkey established a nutritional guideline in order to protect, improve and promote health for the community (1). Guideline evaluated foods by food groups which are: 1) Milk and dairy products, 2) Meat and meat products, eggs, legumes, and nuts/seeds, 3) Bread and cereals, 4) Vegetables, 5) Fruits. Even though vegetables and fruits are generally get evaluated in the same group, they are evaluated separately in this guideline due to their individual benefits.

2.1.1.1. Milk and Dairy Products:

Milk and milk group products contain products such as cheese, yoghurt, kephir and ayran which are made from milk of animals like cow, goat or sheep. Milk and dairy products are essential for all age groups especially for children, because of its rich protein, calcium and phosphorus content and importance on healthy development and growth (7). Standard portion sizes and amounts of foods for milk, yoghurt and cheese group is shown in Table 2.1., total daily portion amounts recommended for milk yoghurt and cheese are shown in Table 2.2. (7)

2.1.1.1.A. Recommended Daily Amounts of Milk and Dairy Group:

Table 2.1. Standard Portion Sizes and Amounts of Foods for milk, yoghurt and cheese group (7)

Food	Size / Amount
Milk	1 cup or 240 ml
Yoghurt	1 cup or 1 small bowl or 200 ml
Kephir	1 cup or 240 ml
Ayran	1.5 cup or 1 big glass or 1 big readymade ayran or 350 ml
White cheese	3 fingers or 2 matchboxes or 60 g
Kashar cheese	2 fingers or 40 g

Table 2.2. Total daily portion amounts recommended for milk yoghurt and cheese (7)

	Boys	Girls
2-3 years	2.5	2
4-6 years	2.5	2.5

2.1.1.2. Meat and Meat Products, Eggs, Legumes and Nuts/Seeds:

This group contains meat, poultry, fish, eggs, nuts/seeds and legumes such as dried beans, chickpeas and lentils. These foods are essential for child nutrition because they contain protein, minerals such as zinc, iron, phosphorus, magnesium and B₁, B₆, and B₁₂, and A vitamins. Protein sources are crucial for infant and child nutrition because of the high protein requirement due to rapid growth. Fish is the primary source of omega-3 fatty acids and a good source of iodine. Adequate intakes of omega-3 fatty acids are important

for brain development. Therefore, consumption of fish is crucial for healthy diet of children. Egg consumption is highly important for children since it is considered as reference protein. Mainly consumed legumes by children are beans, lentils and peas. They contain protein, fiber and minerals of calcium, zinc, iron, magnesium and B vitamins except B₁₂. Mainly consumed nuts and seeds are walnuts, almonds and hazelnut. These are rich on B group vitamins, minerals, oils, and protein (7). Standard portion sizes and amounts for meat-poultry-fish-eggs-legumes-nuts-seeds are shown in Table 2.3., total daily portion amounts recommended for meat-poultry-fish-eggs-legumes-nuts-seeds for boys are shown in 2.4., and total daily portion amounts recommended for meat-poultry-fish-eggs-legumes nuts-seeds for girls are shown in Table 2.5. (7)

2.1.1.2.A. Recommended Daily Amount of Meat and Meat Products, Eggs, Legumes, Nuts/Seeds

Table 2.3. Standard portion sizes and amounts for meat-poultry-fish-eggs-legumes-nuts-seeds (7)

Egg	2 small eggs or 100 g
Cooked red meat	3-4 grilled meatballs or 1 meat at the size of palm or 1 large meat chop or 80 g
Cooked poultry meat	1 medium size chicken baguette or poultry meat at the size of palm or 80 g
Cooked fish	1 slice at the size of a hand or 1 thick slice at the size of a palm or 150 g
Chickpea, beans, cowpea	3/4 cup or 8-10 tablespoons or 130 g
Hazelnut	28-30 pieces or 1 handful or 30 g
Walnut	4-5 large or 6-7 medium or 10-12 small sized pieces or 1 handful or 30 g

Almond	24-26 pieces or 1 handful or 30 g
Peanut	27-30 pieces or 1 handful or 30 g

Table 2.4. Total daily portion amounts recommended for meat-poultry-fish-eggs-legumes-nuts-seeds for boys (7)

AGE	Meat, poultry, fish, eggs Total portion/ day	Meat, poultry Portion/ day	Eggs Portion/ day	Fish Portion/ week	Legumes Portion/ week	Seeds Portion/ day
2-3 years	3/4 - 1	1/4 - 1/3	1/2	2/3 – 1	1	1/8
4-6 years	1- 1 1/2	1/3 - 3/4	1/2	1 - 1 ½	1 - 2	¼

Table 2.5. Total daily portion amounts recommended for meat-poultry-fish-eggs-legumes-nuts-seeds for girls (7)

AGE	Meat, poultry, fish, eggs Total portion/ day	Meat, poultry Portion/ day	Eggs Portion/ day	Fish Portion/ week	Legumes Portion/ week	Seeds Portion/ day
2-3 years	3/4 - 1	1/4 - 1/3	1/2	2/3 – 1	1	1/8
4-6 years	1	1/2	1/2	1 - 1 ½	1 - 2	1/4

2.1.1.3. Fruits and Vegetables:

This food group is the source of minerals and vitamins such as; beta-carotene, folic acid, vitamins E, C and B₂, potassium, iron, calcium, magnesium and fiber. Also, fruits and vegetables have antioxidant properties which help to form resistance to diseases. Fruits and

vegetables are important for children due to their part in growth and development, cell regeneration, tissue repair, skin, eye and dental health and blood production (7).

2.1.1.3. A. Recommended Daily Amount of Vegetables

World Health Organization recommends 400 g or 5 portions of fruits and vegetables per day to promote health. According to TÜBER 2015, recommended portions differ with the recommended value of WHO. 400 g of vegetable-fruit is equals to 2.7 TÜBER portions whereas it is equal to 5 WHO portions. 1 standard portion of fruit and vegetable is determined by TÜBER as 150 g while it is 75 g for WHO (7). Standard portion sizes and amounts for vegetables are shown in Table 2.6., total daily portion amounts recommended for vegetables are shown in Table 2.7., standard portion sizes and amounts for fruits are shown in 2.8. and total daily portion amounts recommended for fruits are shown in 2.9. (7).

Table 2.6. Standard portion sizes and amounts for vegetables (7)

Food	Size / Amount
Dark green leafy vegetables; Salad greens like; Spinach, chard, purslane, Savoy cabbage, vine leaves (cooked) Cabbage lettuce, lettuce, spinach, purslane, parsley, watercress, rocket, mint, lamb's-ear, basil, dill, chicory, cabbage, lettuce (Sliced, chopped or as salad)	1 cup or 1 fist or 5-6 tablespoons or 2 middle-sized ladle or 10-25 vine leaves 2 cup or 2 fist or 1 large bowl
Other green vegetables; Broccoli, okra, green bean, fresh broad bean, green peas, zucchini, artichoke, asparagus, Brussels sprouts (cooked) Green or sweet pepper types, cucumber (chopped, raw) Iceberg lettuce (Sliced, chopped or as salad)	1 cup or 1 fist or 5-6 tablespoons or 2 middle-sized ladle 1 cup or 1 fist or 1 small bowl 2 cup or 2 fist or 1 large bowl

Red-orange-blue-purple vegetables; Tomato, carrot (raw or cooked), red pepper, radish, pumpkin, red beet, egg-plant, red cabbage (chopped, raw or cooked),	1 medium size or 1 cup or 1 fist 1 cup or 1 small bowl or 5-6 tablespoons or 2 middle-sized ladle
White vegetables; Onion, celery, cabbage, cauliflower, leek, mushroom, sunchoke, turnip (chopped, raw or cooked	1 cup or 1 fist or 2 middle-sized ladle or 5-6 tablespoons
Starchy vegetables Potato Fresh corn	1/2 medium size or 1 piece at the size of computer mouse 1/2 cup chopped or puree or 8-10 pieces cut in 6-10 cm 1/2 cup boiled or 1/2 piece large corncob in 20-22 cm

Table 2.7. Total daily portion amounts recommended for vegetables (7)

	Boys	Girls
2-3 years	1-2	1-2
4-6 years	2	2

2.1.1.3.B. Recommended Daily Amount of Fruits

Table 2.8. Standard portion sizes and amounts for fruits (7)

Food	Size / Amount
Apple, orange, peach, nectarine Pear, quince Mandarin Lemon Kiwi Banana Japanese persimmon	1 medium size; in diameter 7 cm or at the size a 1 fist 1 small size or in a size that 5 pieces weight 1 kg 1 medium size; 6 cm in diameter 2 large size; 6.5 cm in diameter 2 medium size; in diameter 5 cm 1 in hand length or slices 2/3 small bowl 2 heaping tablespoons
Watermelon, melon	4-5 slices at a size of a match box or 2 slices in thickness and length of 3 fingers or 3 triangular pieces in size 9 cm x 6 cm x2 cm or 1/16 of watermelon of 8 kg
Cherry, sour cherry Strawberry Grape types Blackberry, raspberry, mulberry Bilberry Pomegranate	13-15 large size or 1 small bowl 7-8 large or 15 medium size 20 large or 25-30 small size or 1 small bowl 50-60 pieces or 1 small bowl 1 small bowl Half in diameter 10 cm or grained in 1 small bowl
Apricot Fig Japanese plum Pineapple Plum	4 large or 7-8 small 2 pieces; 6.5 cm in diameter 8 large or 12 small 1 finger - 2 thin slices in 1.5 cm in thickness 1 large or 3-5 small
Dried apricots, plum, fig Dried grape (raisin), Dates	3-4 pieces 20-30 pieces, 30 g 1 large or 3 small pieces

Table 2.9. Total daily portion amounts recommended for fruits (7)

2-3 years	2-3 years	2-3 years
4-6 years	4-6 years	4-6 years

2.1.1.4. Bread and Cereals

Cereals group includes bread, rice, noodles, couscous, pasta, bulgur, oat, barley and breakfast cereals. These foods are made from cereals such as wheat, oat, rice, rye, barley, and corn. Whole grains are the sources of dietary fibers, vitamin B group, and minerals such as iron, magnesium, selenium. Standard portion sizes and amounts for foods of bread and cereals group are shown in Table 2.10. and total daily portion amounts recommended for bread and cereals are shown in Table 2.11. (7)

2.1.1.4. A. Recommended Daily Amount of Bread and Cereals

Table 2.10. Standard portion sizes and amounts for foods of bread and cereals group (7)

Foods	Size / amount
Bread	2 thin slices or 50 g
Pita-Flatbread-lavash	1/4 small or 1/8 large or 50 g
Bulgur, cooked	1/2 cup or 1 leveled off medium sized ladle or 4-5 tablespoons or 90 g
Rice, cooked	1/2 cup or 1 leveled off medium sized l ladle or 4-5 tablespoons or 90 g
Pasta, boiled	1/2 cup or 1 leveled off medium sized ladle or 4-5 tablespoons or 75 g
Oatmeal / Muesli	1/4 cup or 30 g or 1 leveled off medium sized ladle

Table 2.11. Total daily portion amounts recommended for bread and cereals (7)

	Boys	Girls
2-3 years	2.5	2.5
4-6 years	2.5-3	2.5

2.1.1.5. Fats

Fats contain vitamins A, D, E and K and fatty acids which are essential for health. Dietary fats contain olive oil, other vegetable oils such as sunflower, corn, hazelnut, and sesame oil and butter, margarine (7).

2.1.1.5. A. Recommended Amount of Fats:

Energy coming from fats should be 20-35% of the total energy of the diet. Additionally, TÜBER stated saturated and trans fats as foods that are recommended to be consumed less. Saturated fats should be consumed less than 10% of the energy intake while less than 1% of the energy should come from trans fats (7).

2.1.1.6. Sugar/Sugar Sweetened Beverages:

Sugars are simple carbohydrates and they do not have any nutritional value. Table sugar is obtained from sugar beet and sugar cane. Children generally consume free sugar from products such as candies, chocolates, cakes, cookies and sugar sweetened beverages such as lemonade, soft drinks, cola and sweetened, ready-made fruit juices. Amount of sugar consumption is recommended to be limited because of increased risk of overweight and obesity due to excess and unnecessary intake of calories.

World Health Organization strongly recommends reducing the intake of free sugar throughout the life course and reducing it to less than 10 % of total daily energy intake (20). The guideline of Sugars Intake for Adults and Children by World Health Organization

stated that children with the highest consumption of sugar-sweetened beverages had a higher risk of being overweight or obese than children who had the lowest consumption. Additionally, sugar consumption was associated with increased risk of tooth decay. According to studies investigated in Guideline of Sugars Intake for Adults and Children, there was a positive relationship between the consumption amount of free sugars and dental caries among children and adults (20).

2.1.1.7. Water and Beverages:

Water is the most essential fluid for our body because it is needed for the chemical reactions, digestion, absorption, transporting of nutrients to tissues, removal of harmful substances and regulation of the body temperature. Fluid requirement is provided by drinking water, water from the food and beverages and from water released while gaining energy from foods (7). Recommended daily amount of water is shown in Table 2.12. (7)

2.1.1.7. A. Recommended Daily Amount of Water

Table 2.12. Recommended Daily Amount of Water

Age (years)	Amount (ml/day)
2-3	1300
4-6	1600

2.1.2. Meeting the Nutritional Requirements

According to Turkey Nutrition and Health Survey (TBSA) which was conducted in 2010, consumption of milk and dairy products, meat, chicken, fish, egg, legumes, seeds, nuts, fruits, vegetables and water was below the recommended levels for all age groups. On

the other hand, sugar, salt and saturated fat consumption was above the recommended levels (7).

Frequency of individuals who consume milk and dairy products below the recommended amount of TÜBER was 91% across Turkey (7). Estimated percentages of individuals with total daily consumption of milk, yogurt and cheese are shown in Figure 2.1. (7). However, highest frequency of pupil who consume within and above the recommended level was in 2-3 and 4-6 aged groups respectively for both genders (Figure 2.1). Likewise, a cross-sectional study which used data from Quebec Longitudinal Study of Child Development 1998–2010 revealed that only half of the children consumed the recommended amount of milk products per day in Canada (12).

For meat, chicken, fish, egg, legumes, seeds and nuts group; frequency of individuals across Turkey who consumed below the recommendations of TÜBER 2015 was 92% (7). Moreover, frequency of 2-3 year old children who consume within and above the recommendation was only 7% for both genders and was 8% for 4-6 year old boys and 5% for 2-3 year old girls. Estimated percentages of individuals with total daily consumption of meat, chicken, fish, eggs, legumes, seeds and nuts are shown in Figure 2.2. (7). Similarly Dubois et al. stated that only 39% of children aged 4 years consumed the recommended amount of meat and alternatives per day in Canada (12).

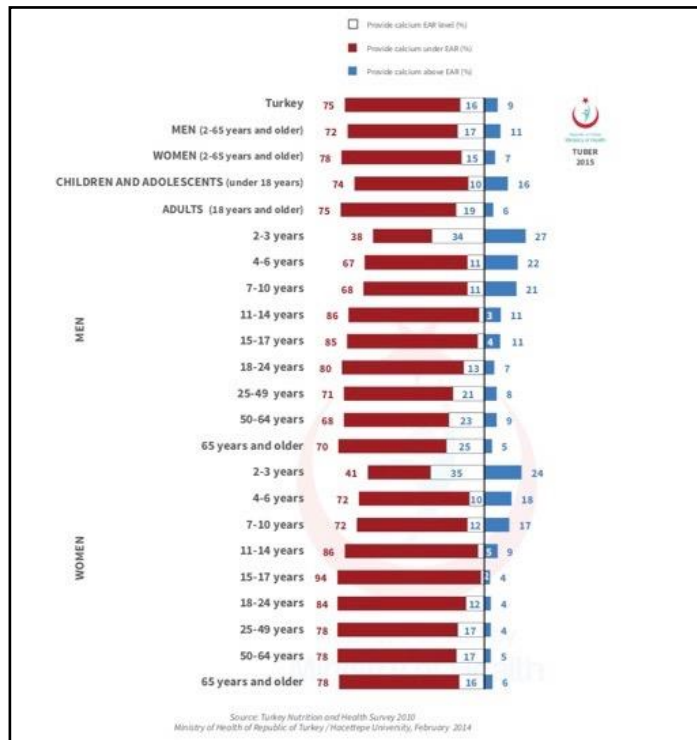


Figure 2.1. Estimated percentage of individuals with total daily consumption of milk, yogurt and cheese, below, within and above the recommended daily number of portions by TÜBER 2015 for dairy foods (7)

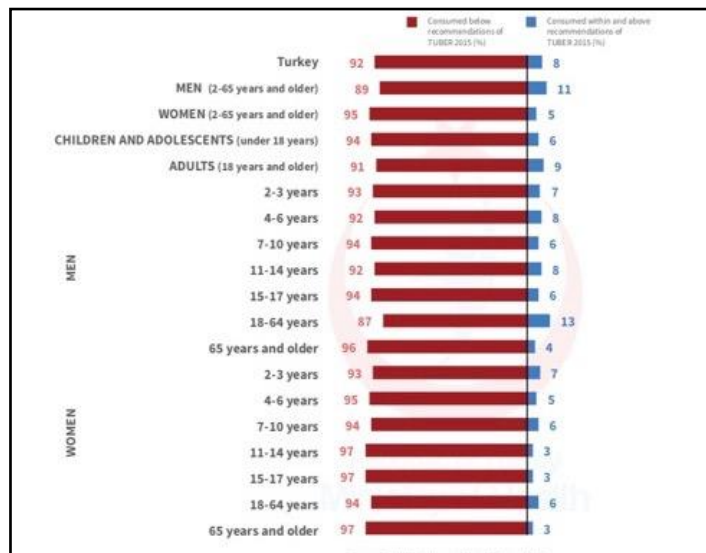


Figure 2.2. Estimated percentage of individuals with total daily consumption of meat, chicken, fish, eggs, legumes, seeds and nuts below, within and above the recommended daily number of portions in TÜBER 2015 for protein foods (7)

Frequency of individuals across Turkey who consume fruits and vegetables below the recommended amount of TÜBER was 74% whereas it was 45% for the amounts recommended by World Health Organization (7). Furthermore, 2-3 age group has the highest frequency for consuming fruit and vegetable below the recommended level for both genders. Frequency of consuming fruits and vegetables within and above the recommended amount of TÜBER was only 15 % for boys and 19% for girls. Estimated percentage of individuals with total consumption of vegetables and fruits are shown in Figure 2.3. (7). These results are consistent with other studies which show that children do not meet the recommendations on vegetable consumption. In enKid study which investigated 3534 people aged varied from 2 to 24 showed that average consumption of vegetables were low (21). When focusing on preschool aged children; as reported by Cooke et al. (2003), a sample of children aged 2 to 6 years consumed vegetables and fruits less frequent than recommended value (22). Similarly, mean number of servings consumed by 4 year old children was 1.2 and only 11 % of children consumed two or more servings (23). Comprehensive study used data from 4 European birth cohorts to examine children aged 2-4 years old. Cohorts stated very low consumption of fruit and vegetables and most of the children consumed less than the recommendation except Portuguese cohort (17). In the case of older children; a cross sectional study which used data from Nurses' Health Study showed that only one fifth of girls and boys met the recommendations (24).

The frequency of individuals in Turkey population who consumed water within and above AI amounts was 49% for adults and 34.1% for children and adolescents. In general, women consume higher than men. When looking into age groups: frequencies were 38.1% and 34.8% for boys and 36% and 28.7% for girls in 2-3 and 4-6 year age groups respectively (7). Percentage of individuals with water intake below and equal or above the Adequate Intake (AI) by gender and age groups in Turkey are shown in Figure 2.4. (7). Similarly, Guelinckx et al. (2015) investigated intake of water and beverages of children and adolescents aged 4 - 17 in 13 countries. Water consumption was less than half of total fluid intake for a large proportion of the children and adolescents which were considered as needed to be increased (25).

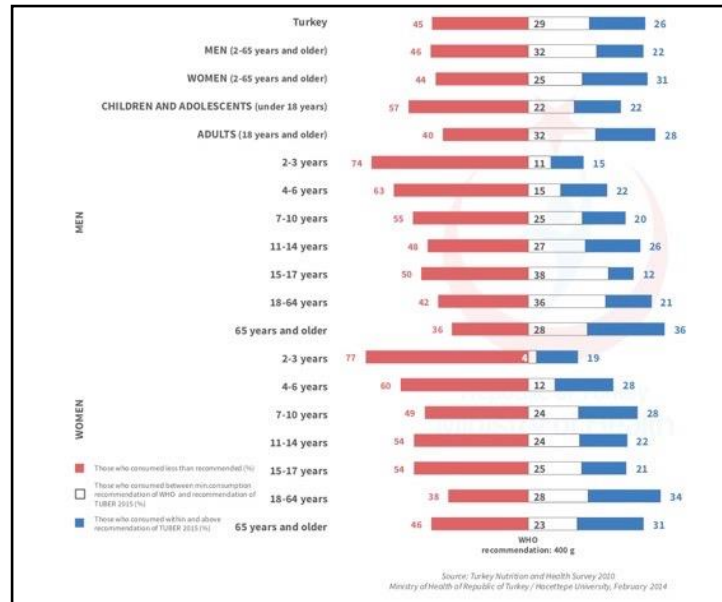


Figure 2.3.. Estimated percentage of individuals with total consumption of vegetables and fruits below, within and above the recommended daily number of portions by WHO and TÜBER 2015 for vegetables and fruits (7).

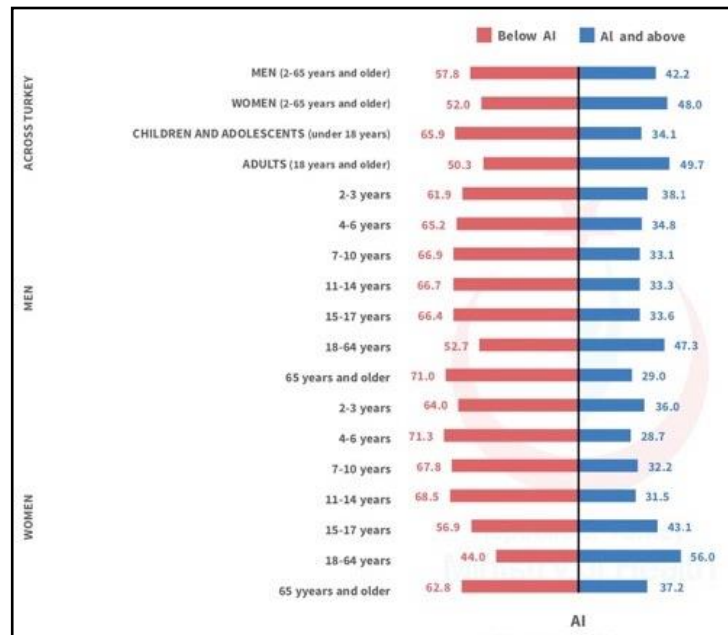


Figure 2.4. Percentage of individuals with water intake below and equal or above the Adequate Intake (AI) by gender and age groups (%) (7)

On the other hand, according to TÜBER, amount of people who consume sugar at the amount of 97th percentile intake is higher than the amount of median intake at every age level (7). 2-3 year old age group has the least frequent intake at 97th percentile and frequency increases as children grows. Median and 97.5 percentile sugar consumption by gender and age groups and by geographical regions in Turkey is shown in Figure 2.5. (7). This result is consistent with Scientific Report of the 2020 Dietary Guidelines Advisory Committee which stated that average consumption of added sugars of Americans ages 1 year and older was 13% of daily calorie intake which represents that Americans also exceed the recommended levels (13). Likewise, analysis of data from the National Diet and Nutrition Survey (NDNS) of 1675 British pre-school children aged 1.5 to 4.5 years in 1993 showed that only 12.5% of children consume sugars within recommended levels (26).

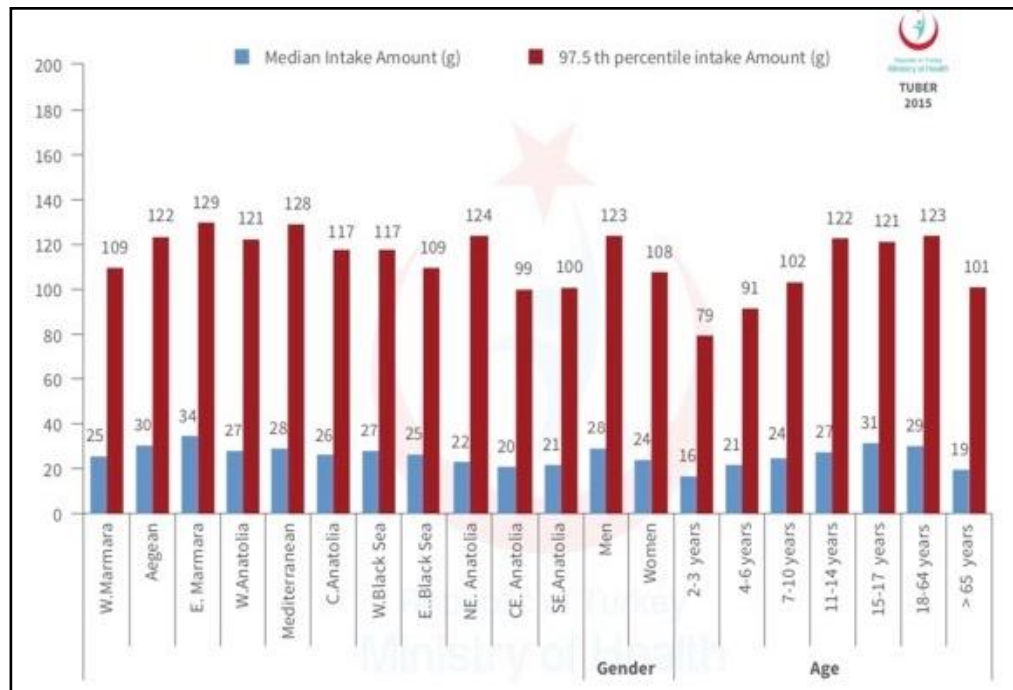


Figure 2.5. Median and 97.5 percentile sugar consumption by gender and age groups and by geographical regions (NUTS I) (7)

2.2. Factors Related to Food Intake of Children Aged 2-5

Factors affecting the child's food intake are generally composed of genetic and environmental factors. Demographic factors affecting food intake of children are age, gender, child's and parents' BMI, number of children at the household, maternal age and parent's educational status.

Furthermore, studies show that the food preferences of children start to be shaped from much earlier, from fetal period and continue to be shaped through breastfeeding and complementary feeding period. Duration of total and exclusive breastfeeding and age of introducing complementary foods are factors affecting the food intake related to infant nutrition.

Preschool aged children are influenced by environmental factors. Generally, children aged between 2 to 5 years spend most of their time at home. Amount of time spending in front of TV, eating habits such as frequency of family meals and frequency of TV exposure during mealtime are the factors affecting home environment thus, influencing food intake of preschool aged children.

Finally, parents' behaviors and practices shapes many and different aspects of their child's development. Preschool aged children are dependent to their family. So, feeding behavior of their caregivers' is influential on their nutrition. These effective behaviors depends on whom the caregiver is and his/her mealtime feeding habits.

2.2.1. Child's Characteristics:

2.2.1.1. Gender

Gender may affect the diet of children aged 2-5 years. However, there is a heterogeneity among studies which investigates this relationship. Most of the studies showed that females are more likely to follow healthy dietary patterns. For instance, a comprehensive EnKid study which observed 2 to 24 year old people on five age groups concluded that girls were more likely to follow the healthy food pattern which correlates

with eating more fruits, vegetables, and fish (21). A 21 year follow up in time periods of ages 10, 16, and 31 showed that fruit and vegetable consumption was higher in women all ages (5).

When focusing on preschool aged children; according to data of TBSA, frequency of girls who consume fruits and vegetables within and above the recommended level was higher than boys for both 2-3 and 4-6 aged groups in Turkey (7). Likewise, as reported by Cooke et al. (2003), boys eat vegetables less frequent than girls in a sample of children aged between 2 to 6 (22). Also, Northstone, Emmett and The ALSPAC Study Team indicated that 3 year old boys scored less than girls in 'healthy' and 'traditional' diet patterns (27). These results are in same direction with other studies that found adolescent girls are more likely to follow healthy eating patterns such as consuming more raw vegetable than boys (28), consuming more vegetables and fruit, drinking less soft drinks than boys (29).

However, TBSA revealed that frequency of boys who consume milk and dairy products within and above the recommended level was higher than girls for both 2-3 and 4-6 aged groups in Turkey. Also, frequency of boys who consume meat, chicken, fish, egg, legumes, seeds and nuts group within and above the recommended level was higher than girls for 4-6 years old group but it was same for 2-3 years olds (7). According to study which used data obtained from the Quebec Longitudinal Study of Child Development and investigated representative sample of 275 children aged 4 years showed that; boys consume higher vegetables and fruit, grain products, meat and meat products than girls (12). In concordance with these results, according to Watt et al. (2001), boys consume milk more frequently than girls (26).

On the other hand, Kranz S and Siega-Riz (2002) found no significant difference between genders for consuming added sugar aged 2 to 5 (30).

2.2.1.2. Age:

It is believed that food intake is related with the age of the child. However, there is heterogeneity about the effect of aging on dietary patterns. A cross-sectional study which

was conducted in Spain and investigated the nutritional risk of a random sample of 3534 individuals aged 2–24 years showed that, being at the age of 2-9 year old was related to being in the lowest nutritional risk (31). Similarly, the report of Dietary Guidelines Advisory Committee which was established by United States Departments of Agriculture (USDA) and Health and Human Services in 2020 indicated that infants consume healthier diet than older children and adolescents and diet quality tends to decreases with age (13).

Some of the studies which made more detailed examination of food groups were in accordance with these results. According to data of TBSA, frequency of consuming milk and dairy products within and above the recommended level of TÜBER decreased through 2-3 to 4-6 years old aged groups in Turkey (7). A longitudinal study which investigated older students showed that consumption of breakfast, fruit and vegetables decreased as they grew older. Furthermore, milk and fruit consumption significantly decreased, between 5th and 8th grade while soft drink consumption increased. High fat, sweet and snack consumption was stable. This showed that children's consumption of beverages was shifted to unhealthier choices across time. (32).

On the other hand, vegetable consumption is believed to be increase over time. According to data of TBSA, frequency of 2-3 years old girls and boys who consume fruits and vegetables within and above the recommended level was lower than the frequency of 4-6 years old children in Turkey (7). Likewise, study which investigated children aged 2 to 6 year olds came to conclusion that older children consume vegetables more frequent than younger ones (22). A follow-up study which focused on higher age group was in accordance with this study. 21 year follow-up, observing the groups of people having mean age of 10, 16 and 31 showed that consumption of fats and saturated fats decreased while vegetable and fruit consumption increased, indicating that children tend to eat healthier through years (5).

2.2.1.3. Body Mass Index (BMI):

Body Mass Index (BMI) formula is calculated by body weight (kg) / [body height (m)²] equation and it is used to classify weight status (8). Even though weight status is one

of most determinant indicator of diet, studies investigating the relationship between child food intakes and their BMI yield conflicting results and studies generally focuses on older children or adults.

In the case of consuming unhealthy beverages; DeBoer et al. (2013) found that high consumption of sugar sweetened beverages were positively related to higher BMI score for 4 and 5 year olds and regularly drinking was related to higher risk of being obese for 5 year olds (33). Similarly, guideline of WHO on Sugars Intake for Adults and Children stated that consumption of sugar sweetened beverages increases the risk of being overweight and obese among children (20). However, according to study of DeBoer et al., this relationship was not seen for 2 year olds (33). Increased consumption of fat and oils, soft drinks, and sodium was found to be positively related with childhood overweight (34).

In the case of consumption of healthy foods, Boumtje et al. found inverse association for some foods but non correlation between other food groups (34). Field et al. (2003) found association among boys but not girls (35). Lin and Morrison (2002) stated that overweight boys ate less vegetables and fruits whereas overweight girls ate less fruit (36). However, Jago et al. (2005) indicated that dietary factors were not associated with BMI among children (37).

2.2.2. Familial Characteristics:

2.2.2.1. Number of Children at the Household

Characteristics of family affect child in various ways. Number of children at the household has an impact on the food intake of child. According to literature, children who have an older sibling may have unhealthier eating habits compared to only children. However there are conflicting findings. While some studies showed that children with older sibling eat healthier food less (18, 27, 31) and unhealthier foods more (27,38) compared to only children, Bornstein et al. stated a positive relationship (39).

2.2.2.2. Caregiver:

Food intake and diet of children are influenced by caregiver's beliefs, attitudes and feeding practices. This relationship is found to be higher if children are younger. For instance, similarity between diets of children and their parents was found to be stronger in younger children who was below 10 years of age compared to older children in a meta analysis investigated 2,692 child-parent pairs (40). Literature investigating the relationship between caregiver and food intake of children generally focuses on characteristics of caregiver such as maternal age, parental education level, parental BMI, and parental feeding practices.

ALSPAC study which investigated children aged 3 showed that children whose meal was prepared by his/her mother rather than someone else was more likely to consume healthy foods and less likely to consume snacks (27). Similarly, a cross sectional study which investigated the relationship between sociodemographic characteristics and added sugar intake of children aged 2 to 5 showed that children who attend to day care or preschool consumed added sugar higher than children who were not (30).

In Turkey, 95.6% of caregivers of children aged 0-5 was women and only 4.4% was men (2). Türkiye'de Aile Yapısı Araştırması was conducted in 2011 by T.C. Ministry of Family and Social Services and it investigated family construct from social, social, economic and cultural perspectives. According to the findings obtained, in almost 90 % of the households with small children in need of care, care was undertaken by mother. The proportion of households where this care was undertaken by their grandparents was 3.5 % and 4.8 % respectively. The rate of this care provided by the kindergarten was 2.4 %. The rates of other family members, neighbors and caregivers vary around 1% (41). So, studies generally focus on the characteristics of mother since she is the primary caregiver of the infant. These characteristics include maternal age and education.

2.2.2.2.A. Maternal Age

Maternal age at the giving birth is influential on food intake of children. ALSPAC study with a sample of 3 year old children showed that maternal age is significantly associated with diet characterized as ‘junk’. As the age of mother increased, mean score of junk food pattern decreased (27). Another article from the data obtained from ALSPAC study, consists of 9550 subjects from the 4 year olds data sweep; showed an inverse association between ‘junk’ food pattern and maternal age (38). Furthermore, maternal age was found to be independently directly associated with core food and fruit-vegetable variety score of 2 year olds (18).

This relationship can be seen in younger children. Study focused on infants aged 4 to 8 month olds showed the association between maternal ages and feeding practices. Younger mothers of 4 months olds were more likely to feed their infants with infant formula, fruit drinks and herbal teas compared to older mothers who significantly more likely to feed with breast milk. Similarly, mothers who were 30 years and older were significantly more likely to feed their 8 month olds infants with breast milk and water, and less likely to feed with cows milk compared to younger ones (42). These results shows that older mothers tend to feed their infants with healthier practices. Likewise, study observed infants aged 6 and 12 months of ages showed that, mothers of children who had higher scores on dietary patterns were older (43).

This effect may be the result of educational level of mother. For instance, Vereckeen et al. (2004) stated that mothers of 2-7 year olds who were highly educated were significantly older compared to low educated mothers (44). Similarly, according to Bornstein et al. (2010), adult mothers scored higher in parenting knowledge compared to adolescence mothers. These results may draw a conclusion that mothers who are older are tend to practice more healthier feeding patterns due to their educational status and/or higher parenting knowledge (39).

2.2.2.2.B. Parental Education Level

Another factor related to familial characteristics is educational level. However, studies focus on educational level of mother's rather than father's. There are many examples examining the relationship between maternal educational status and food intake of children.

Mother's educational status is associated with healthy food intake of children. EnKid study with a random sample of 2 to 24 year old Spanish children and adolescent analyzed food patterns and sociodemographic factors associating with these patterns. Children whose mother had lower educational level were more likely to follow snack food pattern, while children whose mother had higher educational level were more likely to follow healthy food pattern (21). Likewise, according to ALSPAC study; increased level of educational status was positively associated with healthy eating pattern and inversely associated with junk food pattern of 3 and 4 years old children (27,38). Mother's educational status is also associated with unhealthy diet of children. For instance, in enKid study, low educational status of mother was found to be a factor for increased nutritional risk (31). British National Diet and Nutrition Study stated that children whose mother's had low level of education were less likely to meet the recommendations for macronutrient intakes (26). Likewise, Vereecken et al. (2004) stated that mother's educational status was inversely correlated with likelihood of children consuming soft drink regularly (44).

This relationship is observed in younger and older infants besides preschool aged children. For example, maternal education was found to be significantly associated with beverages that infants consumed at 4 and 8th months of age. Graduated mothers were significantly more likely to prefer breast milk, water and fruit juice and they were significantly less likely to prefer cows' milk, squash, herbal drinks and tea/coffee (42).

On the other hand, a study of 21 years follow up which got data at 3 time periods with the mean age of samples as 10, 16 and 31 years did not found any influence of education level of parents on diet quality (5).

2.2.2.2.C. Parental BMI

There is a relationship between parent's BMI status and food intake of their children. Parent's attitudes toward foods, thus their food intake may affect the food intake of the child. Since one of the outcomes of their food intake is their weight status; literature investigates the relationship between parental BMI and children's food intakes (33,45). Most of the studies focus on maternal BMI since mothers are the primary caregiver of the children.

2.2.3. Parenting Knowledge

Association between educational status and age of the mother with child's food intake may be related due to parenting knowledge. According to Bornstein et al. (2010), older mothers scored higher on parenting knowledge scale compared to younger mothers and mothers improved their parenting knowledge between their firstborn and second born children. Also, mothers who were highly educated scored higher compared to low educated mothers on parenting knowledge scale (39). This shows that factors improving the general parenting knowledge of parents may affect their child feeding practices therefore children's food intake.

So, sources that parents use to gain parenting knowledge become important. For instance, Bornstein et al. (2010) stated that mothers who used written materials at the first 6 months of their child's life and mothers who had childbirth classed during pregnancy scored higher on parent knowledge scale even their children were 2 years old (39). Study of Yabancı et al. (2014) which was conducted in Turkey showed that, high nutritional knowledge of parents was positively associated with higher nutrition status of 6 years old children (46).

According to literature, health care professionals, relatives, friends and published sources are the main information sources of parents during the first year of their child's life. However, most of the studies about the sources that mothers used focused on the first two years of child's life (47).

Carruth and Skinner (2001) investigated the sources which was used by mothers of 2 to 54 month old children and stated that sources that mothers use change over time. Friends were cited less frequently in 10-24 months old period while there was no significant change in relatives over time. After 24 months, friends, newspapers and television were used more frequently. This may be the reason of changed topics of interest during this time. For instance, by 48 to 54 months, mothers discussed about child's eating behaviors, food preferences, healthy recipes and started to compare their children with others. When focusing on media sources, it can be seen that information from TV, newspapers and magazines was more frequently cited in 27 to 54 months compared to 10-24 months. Mothers gain information about recipes and food preparations mostly from magazines. Overall, professionals were the major source of information or advice at the first 3 years of child but decreased over time (47).

In addition, since elders' thoughts and beliefs are respected in our culture (48), grandparents or other family members are used as a significant source in Turkey. Likewise, according to findings of Carruth and Skinner (2001), grandmothers were influential sources of information about infant feeding (47).

2.2.4 Infant Nutrition

Literature suggests that food preferences are affected from genetic dispositions and early food experiences. According to Birch (1999), genetic disposition collaborates with eating environment to shape the learned food preferences (49). It is hard to differentiate the environmental factors from genetics during early childhood since parents are the most and only effectual factor shaping their children's behaviors (20).

Development of child's food preferences starts prenatally. Literature states that flavors of the foods that mothers consume transmits from mother to child through amniotic fluid (16) and breast milk (14, 15). Systematic review concluded that, limited evidence indicates flavors of foods and beverages that mother consume during pregnancy can transfer to amniotic fluid. Fetal exposure to a flavor increases the acceptance during infancy and may have a facilitating effect during childhood. Moderate evidence states that flavors

from the maternal diet during lactation such as alcohol, garlic, caraway, carrot, and mint transmits to breast milk and infants can detect these flavors in breast milk. However, these outcomes may not be generalized to other foods and beverages (16). Furthermore, Mennella et al. conducted an experiment in 2001 to show the effect of this transmission on the food preference on infants. Results indicated that infants, who experienced carrot flavor either through amniotic fluid or breast milk, showed fewer negative expressions compared to controls at the time of complementary feeding period (50).

Since breast milk has an important effect on food preferences, so food intake of the child, factors related to breastfeeding becomes influential. These are; whether infant was breastfed or formula fed, duration of exclusive breastfeeding, duration of total breastfeeding and introducing time to complementary foods.

2.2.4.1 Breastfeeding

Breast milk is optimal for infants because it provides all nutrients and energy for the first months of infants lives. Nutrient requirements of full-term, normal birth weight infants generally can be met by breast milk alone for the first 6 months if mother's diet is adequate (19). Breastfeeding is beneficial for both mother and infant (13). Report of 2020 Dietary Guidelines Advisory Committee stated that infants who are fed with breast milk have lower risks of communicable diseases and non-communicable diseases, such as gastrointestinal and respiratory infections, asthma or sudden infant death syndrome, compared to infants who were not breastfed or breastfed for shorter periods (13). Moreover, breastfeeding has been found to be related with 12 to 14 percent reduction on risk of childhood obesity (13). Further collaborating evidence, which included 226508 participants and analyzed studies published between 1997 to 2014 showed that, breastfeeding was significantly correlated with decreased risk of childhood obesity. Furthermore, it shows a dose-response relationship which, as the duration of breastfeeding increases, risk of childhood obesity decreases (51). Based on the 2020 Dietary Guidelines Advisory Committee, exclusive breastfeeding was correlated with a lower risk of type 1 diabetes and longer duration of any (exclusive and total) breastfeeding was correlated to lower risk of

type 1 diabetes and asthma (13). However, optimal duration of breastfeeding corresponding to these outcomes is not well known.

2.2.4.1.A. Recommendations on Breastfeeding

WHO and UNICEF recommend starting breastfeeding in the first hour of birth and continuing exclusively for the first 6 months, which is defined as providing only breast milk without any foods or liquids including water or infant formula (19). Thereafter, since breast milk start to be inadequate for infants' nutritional requirements, infants should start complementary foods and beverages while breastfeeding continues for up to two years of age or beyond (52). The American Academy of Pediatrics recommends exclusive breastfeeding for about 6 months, with continuation of breastfeeding for 1 year or longer as mutually desired by mother and infant, which is agreed by the WHO and the Institute of Medicine (53). Based on the literature and current practices, The European Society for Pediatric Gastroenterology Hepatology and Nutrition (ESPGHAN) recommends to promote exclusive breastfeeding for at least 17 weeks and state exclusive breastfeeding approximately for 6 months as a desirable goal (54).

TBSA stated that mean duration of exclusive breastfeeding was 5.3 months and mean duration of breastfeeding was found to be 9.1 months in Turkey (55).

2.2.4.1.B. Breastfed-Formula Fed Infants

Studies have been conducted to determine the differences between breast milk and formula feeding; which infant formula refers to commercially prepared formula meeting FDA and/or Codex Alimentarius (13). Studies generally focus on its effect on being overweight or obese (13, 51, 56). In the case of its effect on food preferences, most of the studies concluded that breastfeeding facilitates the acceptance of new tastes during complementary feeding compared to formula fed infants. This is because of aromas that had been transmitted to infants during breastfeeding period.

For instance, Hausner et al. (2010) conducted an experimental study on 5-8 months old infants comparing breast and formula feeding. Results showed that breast-fed infants who were exposed or non-exposed to caraway flavor through breast milk had higher initial acceptance to caraway flavored puree compared to formula-fed infants. Moreover, formula-fed infants consumed more plain puree than flavored puree and their liking were lower. This proved that breastfed infants, even if they don't expose to that certain flavor during breastfeeding, had higher acceptance to new tastes during complementary feeding because they are more used to variations in flavors in mother's milk (14).

2.2.4.1.C. Exclusive Breastfeeding Duration

Difference between breastfeeding and formula feeding on acceptance of new flavors makes the exclusive breastfeeding duration significant. According to Cooke et al. (2003), 2 to 4 year old children who were exclusively breastfed had higher intake of fruit and vegetables compared to infants who fed with formula and breast milk and only infant formula (22). Similarly, according to Buriner et al. (2011), 4 years old children who were breastfed exclusively for 4 or more months were more likely to consume two or more servings of vegetables per day. However, study also stated that, there was not a significant effect of being breastfed for 3 months on children's vegetable consumption. This may suggest that there is a threshold of exclusive breast-feeding duration on effect of the preference of infant in upcoming years (23). Moreover, frequency of consumption of water, fruits and vegetables were positively, intake of sugar-sweetened beverages was inversely associated with exclusive breastfeeding duration in 6 year olds (57).

However, meta analysis conducted by Soldateli et al. in 2016 showed no association between exclusive breastfeeding duration and fruit, vegetable consumption among 4-7 years old children (58).

2.2.4.1.D. Total Breastfeeding Duration

Duration of breastfeeding has been associated with consumption of healthy foods. For instance, breastfeeding duration was positively associated with consuming more vegetables at 2 years of age (18) and fruit variety in 6-7-8 years of ages (59). Similarly, breastfeeding duration was positively associated with frequency of consumption of water, fruits, and vegetables among 6 year olds. Compared to formula fed infants, 6 year old infants who were breastfed more than 6 months had higher probability of consumption of fruits more than the median frequency of consumption. Furthermore, 6 years old children who were breastfed more than 12 months had higher probability of consuming water and vegetables. This showed that breastfeeding duration increased the probability of consuming fruit, vegetable and water more than median frequency (57). There is a comprehensive study which used data from 4 European birth cohorts to examine the effect of early feeding practices on fruit and vegetable consumption among children aged 2-4 years old. Breastfeeding duration was found to be related to higher fruit and particularly higher vegetable consumption and shorter breastfeeding duration was correlated with lower vegetable intake (17). Likewise, meta analysis conducted by Soldateli et al. in 2016 stated that, consumption of vegetables among 4 to 7 years old children was positively associated with breastfeeding for 12 months or longer whereas there was not association between fruit consumption (58).

Duration of breastfeeding on unhealthy food consumption has been studied as well. For instance, Perrine et al. (2014) showed that exclusive breastfeeding duration is inversely associated with consumption of sugar sweetened beverages (57). A study investigated older children found no correlation between problematic eating behavior and breastfeeding duration (26).

2.2.4.2. Complementary Feeding

Complementary feeding is defined by World Health Organization(WHO) as a period of giving other foods and liquids beside breast milk, in order to meet the nutritional

requirement of infant when breast milk is not sufficient (19). While WHO includes infant formula in complementary feeding, studies use different definitions. For instance AAP refers it as foods and beverages except human milk or infant formula which are form in liquids, semisolids and solids (13).

2.2.4.2.A. Recommendations on Complementary Feeding

Based on the literature and current practices, The European Society for Pediatric Gastroenterology Hepatology and Nutrition (ESPGHAN) recommends to not introduce complementary foods before 4 months and not to delay it beyond 6 months (54). Recent report of 2020 Dietary Guidelines Advisory Committee which was established by United States Department of Agriculture (USDA) and Human Health Services (HHS), supported existing guidelines of which complementary food and beverages should not be introduced before the age of 4 months. Moreover, Committee concluded that initiating complementary feeding at the age of 4 to 5 months, compared to 6 months, does not offer long-term advantages or disadvantages with related outcomes analyzed. According to evidence, introduction of complementary foods or beverages between ages of 4 and 5 months compared to 6 months does not relates to body composition, weight status, body composition, body circumferences, weight, or length of generally healthy, full-term infants (13). However, limited data stated that initiating complementary feeding before the age of 4 months may be related to higher risk of overweight or obesity (13,60). There is not enough evidence to determine the relationship of introducing complementary food and beverages after the age of 7 months and health outcomes (13).

2.2.4.2.B. Introduction Time of Complementary Feeding

Studies that investigated the age of complementary feeding generally focuses on its effect on weight status of children (37,60). However, studies which investigated the relationship between food intake and timing of introducing complementary food are limited. Cooke et al. (2003) stated that as vegetable and fruits introduced earlier, intakes

increased at the age of 2 to 6 years (22). Similarly, in a sample of children aged 7 years old, children who had been introduced to lumpy foods after the age of 9 month consumed many of the food groups including fruit and vegetables less than children who had been introduced to lumpy foods between 6 to 9 months of age. Also, children introduced to lumpy foods after 10 months of age had more feeding problems at the age of 7 (61). However, another study conducted among younger children showed that age of vegetable introduction was not associated with vegetable variety and exposure scores among children aged between 2 to 24 months of age (59).

There is a comprehensive study used data from 4 European birth cohorts to examine the effect of early feeding practices on fruit and vegetable consumption among children aged 2-4 years old. Relationship between the age of introduction and consumption of fruit and vegetable in young children was weak and inconsistent across the cohorts. For instance, according to ALSPAC, later introduction to fruit was found to be related to lower fruit consumption at 2 years but not at 3, 4, 7, and 9 years. However, introduction of fruit was not related to later fruit intake according to other cohorts. Late introduction to vegetables at complementary feeding period was related to lower vegetable intake up to 13 years according to ALSPAC and the association was found to be consistent throughout childhood. On the other hand, this association was not significant in 3 other cohorts (17).

2.2.5. Child Feeding Practices

One of the most influential factors affecting food intake of children is parents' child feeding practices. A literature review analyzed 22 studies to find out the relationship between parents' child feeding strategies and child's eating and weight status. According to Faith et al. (2004), 86% of the studies states at least one significant association between feeding practices of parents and child outcome (62). Child feeding practices affect child's eating behaviors, food preferences, choices and food intake (63). These practices mainly focus on role modeling, restricting, pressuring and rewarding. According to meta analysis which reviewed the studies that observed the relationship between food consumption of children and parents feeding practices revealed that active guidance, availability, role

modeling and verbal praise was significantly positively correlated with healthy food consumption whereas pressuring had small but negative correlation; restrictive guidance, accessibility and rewarding were not significantly correlated. On the other hand, restrictive guidance and verbal praise had small but significant negative correlation with unhealthy food consumption whereas availability, modeling, pressuring and using food as a reward were positively correlated (64).

2.2.6. Home Environment

Generally, preschool aged children spend most of their time at home. So, characteristics of home environment become influential on their nutrition. Factors that can be effectual related to home environment are food availability and accessibility, meal time practices and TV habits.

Characteristics of home environment can either promote child's health or put child on a higher risk for developing unhealthy eating habits. Schrempft et al. (2015) stated that home environments with higher risk for obesity are related with availability and accessibility of foods at home, parental feeding practices and role modeling, physical activity and media factors at home. Individuals living in high risk home environments consumed less fruit and vegetables but more energy dense snacks and drinks compared to lower risk (65).

2.2.6.1. Frequency of Family Meals

ESPGHAN recommends shared family meals in order to prevent childhood obesity (66). Comprehensive meta analysis conducted by Hammons and Fiese (2011) examined children and adolescents in a sample include 182 836 participants with age ranged from 2.8 to 17.3 years. Study concluded that frequency of family meals were significantly associated with children and adolescents' nutritional health outcomes. Children and adolescents who had family meals 3 or more times a week had healthier dietary pattern and was in a normal weight range (67).

Frequency of family meals affects healthy food intake because foods that are prepared at home are healthier than ready made dinners (24). For example, Fitzpatrick et al. (2007) stated serving fruit, vegetables and milk is positively associated with the number of nights that family eating dinner together in a sample of children aged 1 to 4 years (68). Systematic review and meta analysis which was conducted by Dallacker et al. in 2018 found that, across all studies; having family meals frequently was significantly associated with more healthy diet, less unhealthy diet, lower BMI and better overall diet quality of children (69). Studies done with the adolescents showed similar results. Adolescents who live in a house with more regular eating pattern and have more meals together as a family consume raw vegetables more often (28), consume more vegetables and less fried foods and soda (24), consume more fruits, vegetables, grains, and calcium-rich foods, consume less soft drinks and snack foods (70). However, Sweetman et al. (2011) found no association between preschoolers' vegetable consumption and frequency of family mealtimes in a sample of children aged 2 to 5 years (71).

Meal prepared by parent or prepared together as a family can be more motivational for children to eat. For instance, as reported by Sweetman et al. in 2011, children's vegetable consumption was positively associated with cooking main meal from scratch while negatively associated with using ready-made sauces. Also, liking vegetables was negatively associated with use of pre-prepared dishes for child's main meal (71). Likewise, Cooke et al. (2003) found that traditional family mealtimes are positively associated with fruit and vegetables intake in children aged 2 to 6 (22).

Having a shared mealtime is important for developing a healthy eating behavior. It provides an environment for parents to teach about benefits of healthy eating. According to review of Martin-Biggers et al., family mealtimes increases discussion and nutrition related topics (67) . Even if there is not any overt attempt to promote healthy foods, shared mealtimes can be an opportunity for parents to be a model with their eating behaviors and food consumption.

2.2.6.2. Screen Time

2.2.6.2.A. Recommendations on Screen Time:

Physical inactivity has been stated as one of risk factors for global mortality and contributes to increase in overweight and obesity (72). Guideline which was conducted by World Health Organization stated that; although the evidence for relationship between screen time and adiposity, motor, cognitive development and psychosocial health was moderate to very low-quality, there was mostly unfavorable or null association. So, The Guideline Development Group concluded that decreasing sedentary screen time may improve health. Furthermore, replacing sedentary screen time with more moderate-to vigorous-intensity physical activity can provide additional health benefits. Therefore, according to WHO; sedentary screen time for children aged 2-5 years old should not be more than 1 hour whereas less is better (72).

2.2.6.2.B. Screen Time Duration

Spending time in front of television increases the risk of childhood obesity and overweight because it decreases physical activity, may reduce sleep time, increases exposure to food advertising and may increase energy intake (73).

Spending time in front of TV or any other screen can have harmful effects on child nutrition in various ways. First, it can cause children to consume unhealthy foods while spending time in front of the screen. For example, watching TV more than 2 hours a day at the ages of 4 and 5 was positively related to drinking more than 1 serving of sugar sweetened beverage per day (33). Arslan (2012) and Handy et al. (2009) indicated that snack food consumption was positively associated with screen time (74, 75). Similarly, watching TV 60 minutes or more was significantly associated with consuming high-fat and

high-sugar foods in a sample of 15144 children aged 2–9 in IDEFICS study (76). Miller et al. (2008) reported that, one hour increase for TV viewing per day can cause higher intakes of sugar-sweetened beverages, fast food, red and processed meat, total energy intake and energy intake from trans fat (77). Similarly, time spent on viewing TV was found to be positively associated with frequency of eating fast foods (73). Studies investigating older individuals found similar findings. For example EnKid study showed that people watching TV more than 2 hours a day was likely to consume more snack foods (21). On the other hand, increased time spending in front of the screen can decrease consumption of healthy foods. For instance, Miller et al. (2008) stated that lower intakes of fruit and vegetables for each 1-hour increase of TV viewing per day (77). According to Cox et al., increased duration of screen time was inversely associated with daily vegetable intake (73) and according to and Arslan (2012) it was inversely related to fruit and vegetable intake (74).

2.2.6.2.C. Eating in Front of the TV

TV viewing during mealtime is an important factor affecting eating behavior of children. TV viewing during dinners is significantly associated with increased risk of overweight (76) . Eating in front of the TV may cause children to consume unhealthy foods (76, 78) and it may decrease the communication during family which may decrease the healthy food intake of children (71, 78).

3. MATERIALS AND METHODS

3.1. Participants

In this cross sectional study, participants were legal caregivers / parents of 2 to 5 years old children who applied a private child health and diseases clinic named Sağlıklı Nesiller Çocuk Sağlığı ve Hastalıkları Kliniği in İzmir, Turkey.

132 children were included in this study. Surveys were conducted between February 2020 and June 2020. It was designed to conduct for 3 months with every children meeting inclusion criteria and expected to reach 360 children based on the average number of children admitting to clinic. However, because of COVID19 pandemic, duration was delayed for 2 months. Also, since number of applied children per day was lower than pre pandemic situation, expected number of children was not reach.

The inclusion criteria were as follows; being at the age under 6 and over 2, to be admitted/applied to Sağlıklı Nesiller Çocuk Sağlığı ve Hastalıkları Kliniği, not suffering from a chronic disease that requires a medical nutritional therapy such as diabetes, cealiac, phenylketonuyria etc. and the approval of child and his/her parent.

The exclusion criteria were as follows; being at the age under 2 and over 6, not being admitted to Sağlıklı Nesiller Çocuk Sağlığı ve Hastalıkları Kliniği, having a chronic disease that requires a medical nutritional therapy such as diabetes, cealiac, phenylketonuyria etc. and not having an approval form child and/ or his /her parent.

3.2. Data Collection

After children got examined by pediatricians, surveys were conducted during face to face interviews by the researcher who is practicing as a dietician in Sağlıklı Nesiller Çocuk Sağlığı ve Hastalıkları Kliniği. After parents signed the “informed consent” form, they were requested to answer the questions regarding to their children and themselves (Appendix 7.3). In order to examine the factors affecting children’s nutrition (food intake / adherence to recommendations), three forms were used. Food Frequency Questionnaire

(FFQ) (Appendix 7.4.) was used to determine the food intake while Data Collection Form (Appendix 7.5) and Parent Mealtime Action Scale were used to determine the factors (Appendix 7.6.) After obtaining food intakes from FFQs, amounts of foods were compared to recommendations of Türkiye Beslenme Rehberi to find percentages of adherences. Fats/oils and sweets/high sugary foods were not included in adherence and statistical analysis calculations because recommendations given for these food groups were as proportion of daily caloric intake which was not obtained in this study. So, frequencies of consumption of these food groups were discussed separately. Adherences to recommendations for fruits and vegetables were analyzed separately since children's preferences for these foods may be different. Adherences to recommendations for each food group: milk and dairy; meat and meat products, eggs, legumes, nuts/seeds; fruits; vegetables; bread and cereals and water were calculated. Then averages for these adherences were calculated to get "total dietary adherence".

3.2.1. Food Frequency Questionnaire:

Food Frequency Questionnaire was used to assess the food intake of children. Foods which examined were; milk, yogurt, cheese, red meat, chicken, fish, egg, legumes, nuts/seeds, vegetables, fruits, bread, cereals, vegetable oil, fats, sweets/high-sugary foods and water. Frequency of the intake of these foods were assessed by asking parents to select between the choices of "everyday", "5-6 times in a week", "3-4 times in a week", "1-2 times in a week", "once in 15 days", "once in a month and "never" with regarding the consumption of that particular food in the previous month. Furthermore, they were asked to indicate the amount of portion that his/her children consumed. Parents indicated the amount either in grams or in measures such as table spoon, water glass etc. Amounts were adjusted to the portion amounts that were stated in TÜBER in order to make the comparison.

3.2.2. Data Collection Form

Data Collection Form was prepared by researchers in order to examine the factors affecting nutrition of children. Regarding demographic characteristics; age and gender of

the child were asked. Age of the child was recorded by years. Weight and height measurements of children were made with scales at the clinic by the researcher. Body weight measurement was made with Digital Scale (Seca 769) and height was measured while children were in upright position with length rod on the scale (Seca 220). With the obtained weight (kg) and height (cm) values, researcher assessed weight status by calculating Body Mass Index (BMI). BMI formula was calculated by the Body Weight (kg) / [Body Height (m²)] equation (79). This result was used to determine the weight status of children by World Health Organization Child Growth Standards (BMI for Age Percentiles). WHO Child Growth Standards Charts (BMI for Age Percentile) provides a single international standard that represents the best description of physiological growth for all children from birth to five years of age. Percentiles are classified according to child's sex and age (79). BMI for age percentile values for girls is given in Table 3.1. and BMI for age percentile values for boys is given in Table 3.2. During statistical analysis BMI groups of children were categorized in three groups; underweight (below 15th percentile), normal weight (15-85 percentile) and overweight (above 85 percentile).

Table 3.1. BMI for age percentile values for girls (kg/m²) (7)

Age (year)	Age (year)	Under-weight (<3 rd p.)	Risk of underweight (3-15 th p.)	Normal (15-85.p)	Overweight (85-97.p)	Obese (>97.p)
2	24	<13.5	13.5-14.3	14.4-17.1	17.2-18.5	>18.5
2.5	30	<13.3	13.3-14.2	14.3-16.9	17.0-18.3	>18.3
3	36	<13.2	13.2-14.0	14.1-16.8	16.9-18.2	>18.2
3.5	42	<13.1	13.1-13.9	14.0-16.7	16.8-18.2	>18.2
4	48	<12.9	12.9-13.8	13.9-16.7	16.8-18.3	>18.3
4.5	54	<12.9	12.9-13.8	13.9-16.8	16.9-18.4	>18.4
5	60	<12.8	12.8-13.7	13.8-16.9	17.0-18.6	>18.6
5.5	66	<12.8	12.8-13.7	13.8-17.0	17.0-18.7	>18.7
6	72	<12.8	12.8-13.7	13.8-17.0	17.1-18.9	>18.9

Table 3.2. BMI for age percentile values for boys (kg/m²) (7)

Age (year)	Age (month)	Under-weight (<3 rd p.)	Risk of underweight (3-15 th p.)	Normal (15-85.p)	Overweight (85-97.p)	Obese (>97.p)
2	24	<13.9	13.9-14.7	14.8-17.4	17.5-18.7	>18.7
2.5	30	<13.7	13.7-14.5	14.6-17.2	17.3-18.4	>18.4
3	36	<13.5	13.5-14.3	14.4-17.0	17.1-18.2	>18.2
3.5	42	<13.3	13.3-14.1	14.2-16.8	16.9-18.0	>18.0
4	48	<13.2	13.2-14.0	14.1-16.7	16.8-18.0	>18.0
4.5	54	<13.1	13.1-13.9	14.0-16.7	16.8-18.0	>18.0
5	60	<13.0	13.0-13.8	13.9-16.7	16.8-18.1	>18.1
5.5	66	<13.1	13.1-13.9	14.0-16.6	16.7-18.1	>18.1
6	72	<13.2	13.2-13.9	14.0-16.7	16.8-18.3	>18.3

In order to determine the nutritional status of parents their weights and heights were reported. With the obtained weight (kg) and height (cm) values, researcher assessed weight status by calculating Body Mass Index and used the categorization of World Health Organization. Nutritional status of adults is shown in Table 3.3 (8). During statistical analysis BMI was classified in 3 groups; underweight (BMI: <18.5), normal weight (BMI: 18.5–24.9) and overweight (BMI: >24.9).

Table 3.3. Nutritional Status of Adults (8)

BMI	Nutritional status
Below 18.5	Underweight
18.5–24.9	Normal weight
25.0–29.9	Pre-obesity
30.0–34.9	Obesity class I
35.0–39.9	Obesity class II
Above 40	Obesity class III

Number of children in the household, presence of older/younger siblings, age of the mother when she gave birth and educational status of parents were asked. Respondents were asked to choose between choices of primary school, high school, university and post-graduate.

Infant nutrition was examined by three questions. First was regarding to assess exclusively breast-feeding duration. Participant was asked to answer the question; “How many months was your infant exclusively breastfed?” and exclusively breastfeeding was explained by consuming only breast milk, not even consuming water nor formula. Second question was “How many months your infant was breastfed in total?” regarding to assess the total duration of breastfeeding. Third question was about the initiation time of complementary feeding. Participants were asked to answer the question; “From which age (which month) did your infant start complementary feeding?” Regarding to the definition of AAP complementary food was described by the researcher as lumpy foods such as yogurt, fruit or vegetable puree except breast milk and infant formula (13).

Home environment was examined by questioning TV/screen viewing and meal habits. “How many hours per day does your child spend time in front of the TV/tablet/smart phone?” was asked to assess the duration of time spending on screen. Participants were asked to select between choices of “less than 1 hour”, “an hour”, “more than 1 hour” and “more than two hours”. One hour was an indicating value depending on the recommendations on screen viewing of children in this age group (72). For further information on screen viewing; “Does your children eat in front of the TV?” and “If so, what is the frequency?” were asked. Participants indicated the frequency by selecting the choices from “never”, “sometimes”, “mostly” and “all the time”. Third question was regarding to examine the frequency of family dinners by asking “How many days in a week you have dinner as a family?”. Participants were asked to choose from choices; “never”, “1-2”, “3-4”, “5-6” and “6-7”.

Participants were asked to indicate the caregiver with the question; “Who takes the care of your child during the day?”. Choices were “mother”, “father”, “family elder”, “babysitter” or “other (indicate what)”.

Information sources which parents use to gain information about child nutrition were examined in two parts. First, participants were asked to state the frequency of using identified sources and second, how much they find these sources beneficial. They were asked to answer these two questions on each source on Likert scale as “never”, “rarely”, “sometimes”, “mostly and “always”. Examined information sources were pediatrician, nutritionist, family elders/relatives, friends, written sources, Instagram, Twitter, Facebook and television.

3.3.3. Parent Mealtime Action Scale

Parent Mealtime Action Scale was developed by M.Hendy et al. in 2009 (75). Nesrin Arslan and Saime Erol (80) conducted reliability and validity studies for the Turkish adaptation of the Parent Mealtime Action Scale in 2014. Scale was used to identify the mealtime feeding behaviors of parents (75). It consists of 31 statements in 9 subgroups. Respondents were asked to use a three point scale (1=never, 2=sometimes, 3=always) to rate “During a typical week, how often do you show each mealtime action?”. Scale does not have a total value and each subgroup was evaluated as a different scale. Frequency of the use of each subgroup was calculated by getting the mean of the corresponding answers of questions related to that subgroup. Dimension having the highest mean value (3 being the highest) was evaluated as the behavior that parents used the most. Reverse scoring was done for the questions 2 and 31 (If respondent answered 1, it was calculated as 3 and if it was answered 3, it was calculated as 1).

Description and corresponding questions of subgroups are listed below:

- 1. Snack Limits:** Consists of questions; 25, 26 and 27. It evaluates the restrictions that parents put on their children on the amount of food, drink and snacks.
- 2. Positive persuasion:** Consists of questions; 13, 14, 15 and 16. It evaluates the verbal persuasions that parents use in order to persuade their children on eating.

- 3. Daily fruit and vegetable availability:** Consists of questions; 17, 19 and 20. It evaluates the behaviors of parents about the amount of fruit and vegetables that consumed by themselves and their children.
- 4. Use of rewards:** Consists of questions; 1, 6, 7 and 8. It evaluates the activities or foods that parents offer in order to persuade their children to eat.
- 5. Insistence on eating:** Consists of questions; 28, 29 and 30. It evaluates the pressure that parents put on their children to eat.
- 6. Snack modeling:** Consists of questions; 21, 22 and 23. It evaluates parent's eating behavior on snack consumption.
- 7. Special meals:** Consists of questions; 2, 3, 11 and 31. It evaluates whether a special meal is prepared for the children different from family members.
- 8. Fat reduction:** Consists of questions; 12, 18 and 24. It evaluates fat consumption behaviors of parents.
- 9. Many food choices:** Consists of questions; 4, 5, 9 and 10. It evaluates parent's behaviors on letting their children to make choices about their food intake.

3.4. Statistical Analysis

Statistical analysis of all the study data was performed using IBM SPSS (*Statistical Package for the Social Sciences*) Statistics for Windows, Version 22.0 (Armonk, NY: IBM Corp.). Descriptive data were expressed in mean $\pm$ standard deviation (SD), median (min-max) or number and frequency. The distribution of variables was checked with the Kolmogorov-Smirnov test. To compare between groups, Mann Whitney-U or Kruskal Wallis test was performed for quantitative variables and Chi-squared test or Fisher exact test was performed for the categorical data. A p value <0.05 was accepted as statistically significance.

"Underweight" group for maternal BMI, "3" for number of children at the household, "<25" group for maternal age, "primary school graduate" for father's education status was excluded from comparable statistics due to low number of values in groups. However, they were shown in the tables.

3.5. Ethics

This study was carried out after the ethical approval of Yeditepe University Clinical Research Ethics Committee (KAEK) in 29.01.2020 with KAEK Approval No: 1156 (Appendix 7.1.) After getting institutional permission (Appendix 7.2.), surveys were applied with the written permission and obtained informed concept of the parents/legal caregivers.

4. RESULTS

4.1 Factors Related with Adherence to Recommendations

132 children aged 2-5 years old were included in our study. Ages of the children were distributed as follows; 24 (18.2%) were 2 years old, 47 (35.6%) were 3 years old, 30 (22.7%) were 4 years old and 31 (23.5%) were 5 years old. Among the study population; 52 (39.4%) were girls and 80 (60.6%) were boys.

87 (65.9%) of the children were only child, 44 (33.3%) of them had a sibling and 1 (0.8%) had two siblings. While 23 (17.4%) of the children had older siblings, 15 (11.4%) had younger siblings.

25 (18.9%) of the mothers were high school graduates, 82 (62.1%) of them were university graduates and 25 (18.9%) were post-graduates. 1 (0.8%) of the fathers was primary school graduate, 21 (15.9%) of them were high school graduates, 92 (69.7%) were university graduates and 18 (13.5%) were post graduates.

Number of children who were underweight, normal weight and overweight were 29 (22%), 70 (53%) and 33 (25%) respectively. According to BMI classification of mothers; 6 (4.5%) were underweight, 93 (70.5%) were normal weight and 33 (25%) were overweight. As for the fathers; 38 (28.8%) were normal and 94 (71.2%) were overweight.

5 (3.8%) of the mothers gave birth when they were younger than 25 years old, 51 (36.8%) of them were between 26-30 years old, 48 (36.4%) were between 31-35 years old and 27 (20.5%) were 36 years and older. 57 (43.2%) of the children had been taken care by their mothers, 41 (31.1%) in kinder garden, 19 (14.4%) by elder family member and 15 (11.4%) by nanny.

According to time spending in front of the screen; 40 (30.3%) stated the duration as less than 1 hour, 32 (24.2%) as 1 hour, 34 (25.8%) as 1 - 2 hours and 26 (19.7%) as more than 2 hours a day. While 39 (29.5%) of the children did not eat in front of the screen, 50 (37.9%) stated as sometimes, 25 (18.9%) as frequently and 18 (13.6%) as always.

Considering the frequency of having family meals during a week; 6 (4.5%) families stated as never, 8 (6.1%) as 1-2 times a week, 15 (11.4%) as 3-4 times a week, 24 (18.2%) as 5-6 times a week and 79 (59.8%) as every day.

4.2 Infant Nutrition:

48 (36.4%) of the children were exclusively breastfed for less than four months, 17 (12.4%) were exclusively breastfed for 4-6 months, 48 (36.4%) were exclusively breastfed for 6 months and 19 (14.4%) of them were exclusively breastfed for more than 6 months. About total duration of breastfeeding; 34 (25.8%) were breastfed for less than 6 months, 21 (15.9%) were breastfed for 7 to 12 months, 26 (19.7%) were breastfed for 13 to 18 months, 20 (15.2%) were breastfed for 19 to 23 months and 31 (23.5%) were breastfed for more than 2 years. 46 (34.8%) children started complementary feeding between 4-6 months, 59 (44.7%) children started at 6 months and 27 (20.5%) children after 6 months.

4.3. Used Information Sources

Consumption frequencies of various information sources were asked. Results revealed that families mostly consulted pediatricians for child nutrition. Looking at the use of social media about the nutrition of children, the most frequently used social media platform was Instagram. In addition, one family stated that they received information from nurse and one from school psychologist. Other details on frequency of used information sources are present at Table 4.1.

When families were asked how beneficial they found these sources; it was seen that the most useful sources for parents were pediatricians, dietitians and written sources respectively. About social media; most useful platform was found to be Instagram. Table 4.2 shows other details on usefulness of information sources.

Table 4.1. Frequency of Used Information Sources About Child Nutrition

	Never	Rarely	Sometimes	Frequently	Always
Pediatrician	5(3.8%)	19 (14.4%)	32 (24.2%)	29 (22%)	47 (35.6%)
Dietitian	38 (28.8%)	16 (12.1%)	24 (18.2%)	21 (15.9%)	33 (25%)
Family elders /relatives	15 (11.4%)	38 (28.8%)	41 (31.1%)	25 (18.9%)	12 (9.1%)
Friends	24 (18.2%)	62 (47%)	32 (24.2%)	13 (9.8%)	1 (0.8%)
Written sources	11 (8.3%)	26 (19.7%)	45 (34.1%)	38 (28.8%)	12 (9.1%)
Instagram	43 (32.6%)	31 (23.5%)	35 (36.5%)	21 (15.9%)	2 (1.5%)
Twitter	110 (83.3%)	16 (12.1%)	4 (3.1%)	2 (1.5%)	-
Facebook	97 (73.5%)	22 (16.7%)	11 (8.3%)	2 (1.5%)	-
Television	64 (48.5%)	33 (25%)	26 (19.7%)	9 (6.8%)	-

Table 4.2. Usefulness of Information Sources

	Not useful	Rarely useful	Sometimes useful	Mostly useful	Very useful
Pediatrician	-	2 (1.5)	15 (11.4%)	25 (18.9%)	90 (68.2%)
Dietitian	9 (6.8%)	4 (3%)	20 (15.2%)	28 (21.2%)	71 (53.8%)
Family elders/relative s	10 (7.6%)	25 (18.9%)	53 (40.2%)	29 (22%)	15 (11.4%)
Friends	13 (9.8%)	70 (53%)	37 (28%)	10 (7.6%)	2 (1.5%)
Written sources	8 (6.1%)	11 (8.3%)	37 (28%)	47 (35.5%)	29 (22%)
Instagram	37 (28%)	41 (31.1%)	37 (28%)	15 (11.4%)	2 (1.5%)
Twitter	101 (76.5%)	25 (18.9%)	4 (3%)	2 (1.5%)	
Facebook	91 (68.9%)	30 (22.7%)	8 (6.1%)	3 (2.3%)	
Television	53 (40.2%)	44 (33.3%)	26 (19.7%)	9 (6.8%)	

4.4. Child Feeding Practices

Subgroups of Parent Mealtime Action Scale were calculated. Highest subgroup was “daily fruit and vegetable intake” and found to be the most used behavior by parents. Subgroups of Parent Mealtime Action Scale are shown in Table 4.3.

Table 4.3. Parent Mealtime Action Scale

Subgroups of PMAS	Mean±SD
	Median (Min-Max)
Snack limits	2.43±0.65 2.66 (1-3)
Positive persuasion	2.28±0.46 2.50 (1.25-3)
Daily fruit and vegetable availability	2.63±0.42 2.66 (1.33-3)
Use of rewards	1.65±0.42 1.50 (1-3)
Insistence on eating	1.43±0.50 1.33 (1-3)
Snack modeling	1.39±0.44 1.33 (1-2.67)
Special meals	1.48±0.38 1.50 (1-2.5)
Fat reduction	2.18±0.53 2.33 (0.67-3)
Many food choices	2.12±0.40 2.00 (1-3)

4.5. Food Consumptions of the Sample

4.5.1. Milk and Dairy

Consumption amount of milk was 6.10 ± 5.82 portions, yoghurt was 7.30 ± 4.36 portions and cheese was 3.98 ± 2.54 portions per week. The total amount of milk and dairy products consumed per week was 17.34 ± 7.94 portions. Consumption frequencies of milk and dairy are given in Table 4.4.

Table.4.4 Consumption Frequencies of Milk, Yogurt and Cheese

	Consumption frequency of milk n (%)	Consumption frequency of yoghurt n (%)	Consumption frequency of cheese n (%)
Never	19 (14.4)	8 (6.1)	10 (7.6)
Once a month	8 (6.1)	2 (1.5)	1 (0.8)
Once in every 15 days	2 (1.5)	2 (1.5)	1 (0.8)
1-2 times a week	15 (11.4)	1 (0.8)	4 (3.0)
3-4 times a week	12 (9.1)	18 (13.6)	20 (15.2)
5-6 times a week	8 (6.1)	12 (9.1)	18 (13.6)
Everyday	68 (51.5)	89 (67.4)	78 (59.1)

4.5.2. Meat and Meat Products, Eggs, Legumes and Nuts/Seeds

Consumption amount of chicken and meat was 3.20 ± 1.63 portions, fish was 0.63 ± 0.50 portions, egg was 2.86 ± 1.46 portions, legumes was 1.06 ± 0.59 portions and amount of nuts/seeds was found to be 10.70 ± 8.38 portions. The consumption frequencies of red meat, chicken, fish, eggs, legumes and nuts/seeds of children are given in Table 4.5.

Table 4.5. Consumption Frequencies of Meat and Meat Products, Eggs, Legumes and Nuts/Seeds

Consumption frequency n (%)	Red meat	Poultry	Fish	Egg	Lentils	Nuts/seeds
Never	3 (2.3)	38 (28.8)	16 (12.1)	11 (8.3)	5 (3.8)	8 (6.1)
Once a month	-	24 (18.2)	10 (7.69)	1 (0.8)	1 (0.8)	3 (2.3)
Once in every 15 days	1 (0.8)	21 (15.9)	21 (15.9)	-	8 (6.1)	1 (0.8)
1-2 times a week	15 (11.4)	32 (24.2)	79 (59.9)	5 (3.8)	49 (37.1)	12 (9.1)
3-4 times a week	68 (51.5)	14 (10.6)	5 (3.8)	22 (16.7)	58 (43.9)	35 (26.5)
5-6 times a week	20 (15.2)	1 (0.8)	1 (0.8)	10 (7.6)	9 (6.8)	14 (10.6)
Everyday	25 (18.9)	2 (1.5)	-	83 (62.9)	2 (1.5)	59 (44.7)

4.5.3. Fruits and Vegetables:

Consumption amount of vegetables was 5.8 ± 3.76 portions and fruits was 10.44 ± 5.83 portions per week. Vegetable and fruit consumption frequencies of children are given in Table 4.6.

4.5.4. Bread and Cereals

Consumption amount of bread was 4.93 ± 3.73 and grains were 6.61 ± 3.76 portions per week. Total bread and cereal consumption amount were 11.29 ± 6.34 portions per week. Bread and cereal consumption frequencies of children are given in the Table 4.7.

Table 4.6. Consumption Frequencies of Vegetables and Fruits

	Vegetables consumption frequency n (%)	Fruits consumption frequency n (%)
Never	2 (1.5)	-
Once a month	-	-
Once in every 15 days	3 (2.3)	2 (1.5)
1-2 times a week	10 (7.6)	5 (3.8)
3-4 times a week	25 (18.9)	18 (13.6)
5-6 times a week	21 (15.9)	14 (10.6)
Everyday	71 (53.8)	93 (70.5)

Table 4.7. Consumption Frequencies of Bread and Grains

	Bread consumption frequency n (%)	Grains consumption frequency n (%)
Never	6 (4.5)	-
Once a month	1 (0.8)	-
Once in every 15 days	3 (2.3)	-
1-2 times a week	11 (8.3)	7 (5.3)
3-4 times a week	10 (7.6)	23 (17.4)
5-6 times a week	10 (7.6)	26 (19.7)
Everyday	91 (68.9)	76 (57.6)

4.5.5. Water

Water consumption of children was 1056.81 ± 358.04 ml. per day.

4.5.6. Sugar

Table 4.8. Consumption Frequency of Sugar

	Sugar consumption frequency n (%)
Never	17 (12.9)
Once a month	6 (4.5)
Once in every 15 days	12 (9.1)
1-2 times a week	27 (20.5)
3-4 times a week	27 (20.5)
5-6 times a week	12 (9.1)
Everyday	29 (22.0)

4.5.7. Fat

Both oil and fat were used everyday.

4.6. Adherence to Recommendations

4.6.1 Adherence to Recommendations for Milk and Dairy Products

Of the 132 children included in our study; 42 (31.8%) were classified as having poor adherence, 51 (38.6%) as having good adherence and 39 (29.5%) were in excessive intake group.

4.6.1.1. Factors Related with Adherence to Recommendations for Milk and Dairy Products

There was no significant difference between genders, age groups, maternal BMIs, maternal age groups, caregivers and educational status of both parents regarding adherence to the recommendations. No significant difference was observed regarding to number of children at the household, presence of older/younger siblings and frequency of eating in front of the screen, total time spent in front of the screen and frequency of family dinners per week ($p > 0.05$).

However, significant difference was observed between children's BMIs regarding adherence to the recommendations. Children who have normal weight were significantly in good adherence group. Also, significant difference was found between paternal BMI groups. Children of overweight fathers were significantly in excessive intake group ($p > 0.05$). Details are shown in Table 4.9.

4.6.1. 2. Infant Nutrition and Adherence to Recommendations for Milk and Dairy Products

No significant difference was observed between total durations of breastfeeding and times of starting complementary feeding regarding adherence to the recommendations ($p > 0.05$). However, significant difference was observed between groups of exclusive breastfeeding durations regarding adherence to the recommendations. Children who were exclusively breastfed for more than 4 months, which is all other groups, were significantly in good adherence group. Details are shown in Table 4.10.

Table 4.9. Factors Related with Adherence to Recommendations for Milk and Dairy Products

	Poor adherence N (%)	Good adherence n (%)	Excessive Intake n (%)	Significance P
Gender:				
Girls	17 (40.5)	19 (37.3)	16 (41.0)	p = 0.922
Boys	25 (59.5)	32 (62.7)	23 (59)	
Age:				
2	14 (32.6)	5 (9.8)	5 (13.2)	p=0.065
3	15 (34.9)	18 (35.3)	14 (36.8)	
4	8 (18.6)	15 (29.4)	7 (18.4)	
5	6 (14)	13 (25.5)	12 (31.6)	
BMI:				
Underweight	14 (33.3)	10 (19.6)	5 (12.8)	p=0.027*
Normal weight	22 (52.4)	30 (58.8)	18 (46.2)	
Overweight	6 (14.3)	11 (21.6)	16 (41.0)	
Maternal BMI:				
Underweight	1 (2.4)	4 (7.8)	1 (2.6)	p=0.108
Normal weight	31 (73.8)	39 (76.5)	23 (59.0)	
Overweight	10 (23.8)	8 (15.7)	15 (38.5)	
Paternal BMI:				
Normal weight	14 (33.3)	20 (39.2)	4 (10.3)	p=0.008*
Overweight	28 (66.7)	31 (60.8)	35 (89.7)	
Maternal age:				
<25	2 (4.9)	3 (5.9)	-	p=0.654
25-30	19 (46.3)	19 (37.3)	13 (33.3)	
31-35	13 (31.7)	19 (37.3)	16 (41.0)	
>36	7 (17.1)	10 (19.6)	10 (25.6)	

Number of children at the household				
1				
2	31 (78.1)	34 (66.7)	22 (56.4)	p = 0.183
3	10 (23.8)	17 (33.3)	17 (43.6)	
	1 (2.4)	-	-	
Presence of older siblings				
Yes	35 (83.3)	45 (88.2)	29 (74.4)	p = 0.225
No	7 (16.7)	6 (11.8)	10 (25.6)	
Presence of younger siblings				
Yes	38 (90.5)	43 (84.3)	36 (92.3)	p = 0.482
No	4 (9.5)	8 (15.7)	3 (7.7)	
Education level of mother				
High school graduate	8 (19.0)	7 (13.7)	10 (25.6)	p = 0.686
University graduate	27 (64.3)	33 (64.7)	22 (56.4)	
Post graduate	7 (16.7)	11 (21.6)	7 (17.9)	
Education level of father				
Primary school graduate	-	-	1 (2.6)	p = 0.244
	9 (21.4)	7 (13.7)	5 (12.8)	
High school graduate	26 (61.9)	35 (68.6)	31 (79.5)	
University graduate	7 (16.7)	9 (17.6)	2 (5.1)	
Post graduate				
Caregiver				
Mother	23 (54.8)	16 (31.4)	18 (46.2)	p = 0.365
Family elder	4 (9.5)	10 (19.6)	5 (12.8)	
Nanny	5 (11.9)	7 (13.7)	3 (7.7)	
Kinder garden	10 (23.8)	18 (35.3)	13 (33.3)	

Frequency of eating in front of the screen				
Never				
Sometimes	12 (28.6)	16 (31.4)	11 (28.2)	p = 0.108
Frequently	14 (33.3)	15 (29.4)	21 (53.8)	
Always	11 (26.2)	9 (17.6)	5 (12.8)	
	5 (11.9)	11 (21.6)	2 (5.1)	
Total time spent in front of the screen				
Less than 1 hour				
1 hour	14 (33.3)	17 (33.3)	9 (23.1)	p = 0.896
More than 1 hour	9 (21.4)	12 (23.5)	11 (28.2)	
More than 2 hours	11 (26.2)	11 (21.6)	12 (30.8)	
	8 (19.0)	11 (21.6)	7 (17.9)	
Frequency of family dinners per week				
Never				
1-2	1 (2.4)	4 (7.8)	1 (2.6)	p=0.133
3-4	3 (7.1)	2 (3.9)	3 (7.7)	
5-6	3 (7.1)	10 (19.6)	1 (2.6)	
6-7	9 (21.4)	10 (19.6)	5 (12.8)	
	26 (61.9)	25 (49.0)	29 (74.4)	

Chi-squared test was applied.

Table 4.10. Infant Nutrition and Adherence to Recommendations for Milk and Dairy Products

	Poor adherence n (%)	Good adherence n (%)	Excessive intake n (%)	Significance p
Exclusive breastfeeding:				
<4 months	20 (47.6)	10 (19.6)	18 (46.2)	p=0.047*
4-6 months	5 (11.9)	10 (19.6)	2 (5.1)	
6 months	12 (28.6)	21 (41.2)	15 (38.5)	
>6 months	5 (11.9)	10 (19.6)	4 (10.3)	
Total breastfeeding				
<6				p = 0.164
7-12	18 (42.9)	10 (19.6)	6 (15.4)	
13-18	4 (9.5)	10 (19.6)	7 (17.9)	
19-23	6 (14.3)	10 (19.6)	10 (25.6)	
More than 2 years	5 (11.9)	10 (19.6)	5 (12.8)	
	9 (21.4)	11 (21.6)	11 (28.2)	
Complementary Feeding				
4-6 months	17 (40.5)	16 (31.4)	13 (33.3)	p = 0.924
6 months	17 (40.5)	24 (47.1)	18 (46.2)	
>6 months	8 (19.0)	11 (21.6)	8 (20.5)	

Chi-squared test was applied

4.6.1. 3. Information Sources and Adherence to Recommendations for Milk and Dairy Products

There was no significant difference in adherence between the frequency of used sources by families: pediatrician ($p = 0.441$), dietician ($p = 0.497$), relatives and family elders ($p = 0.198$), friends ($p = 0.884$), written sources ($p = 0.614$), Facebook ($p = 0.198$), Twitter ($p = 0.683$) and Instagram ($p = 0.710$).

However, frequency of television use ($p = 0.030$) was statistically significant regarding adherence to the recommendations. Television use was observed to be less frequent in families with children in good adherence group (Table 4.11.).

Table 4.11. Frequency of Television Use and Adherence to Recommendations for Milk and Dairy Products

	Never	Rarely	Sometimes	Frequently
Poor adherence n (%)	18 (42.9)	13 (31)	10 (23.8)	1 (2.4)
Good adherence n (%)	31 (60.8)	6 (11.8)	11 (21.6)	3 (5.9)
Excessive intake n (%)	15 (38.5)	14 (35.9)	5 (12.8)	5 (12.8)

According to usefulness of the sources regarding adherence to the recommendations, no significant difference was found for pediatrician ($p = 0.249$), dietician ($p = 0.571$), relatives and family elders ($p = 0.846$), friends ($p = 0.999$), written sources ($P=0.657$), Facebook ($p = 0.598$), Twitter ($p = 0.937$) and Instagram ($p = 0.546$).

However there was significant difference between usefulness of television regarding

adherence to the recommendations ($p = 0.015$). Television was found to be less useful for families with children adhering to recommendations (Table 4.12.).

Table 4.12. Usefulness of Television and Adherence to Recommendations for Milk and Dairy Products

	Not useful	Rarely useful	Sometimes useful	Mostly useful
Poor adherence n (%)	16 (38.1)	18 (42.9)	8 (19)	-
Good adherence n (%)	27 (52.9)	14 (27.5)	6 (11.8)	4 (7.8)
Excessive intake n (%)	10 (25.6)	12 (30.8)	12 (30.8)	5 (12.8)

Chi-squared test was applied

4.6.1.4 Child Feeding Practices and Adherence to Recommendations for Milk and Dairy Products

There was no significant difference regarding adherence to the recommendations, between subgroups of the Parent Mealtime Action Scale ($p > 0.05$) (Table 4.13.).

Table 4.13. Parent Mealtime Action Scale and Adherence to Recommendations for Milk and Dairy Products

	Poor Adherence	Good Adherence	Excessive Intake	P
	Mean±SD Med (Min-Max)	Mean±SD Med (Min-Max)	Mean±SD Med (Min-Max)	
Snack limits	2.42±0.67 2.66 (1-3)	2.50±0.63 2.66 (1-3)	2.38±0.59 2.33 (1-3)	p=0.534
Positive persuasion	2.30±0.49 2.50 (1.25-3)	2.22±0.44 2.25 (1.25-3)	2.35±0.43 2.50 (1.5-3)	p=0.384
Daily fruit and vegetable availability	2.57±0.42 2.66 (1.67-3)	2.58±0.47 2.66 (1.33-3)	2.75±0.32 3.00 (2-3)	p=0.166
Use of rewards	1.69±0.46 1.62 (1-2.75)	1.65±0.39 1.75 (1-2.5)	1.60±0.43 1.50 (1-3)	p=0.643
Insistence on eating	1.40±0.53 1.33 (1-3)	1.42±0.47 1.33 (1-3)	1.51±0.46 1.33 (1-2.67)	p=0.331
Snack modeling	1.48±0.43 1.50 (1-2.33)	1.30±0.37 1.33 (1-2)	1.45±0.48 1.33 (1-2.67)	p=0.159
Special meals	1.50±0.35 1.50 (1-2.25)	1.48±0.39 1.50 (1-2.5)	1.46±0.42 1.50 (1-2.50)	p=0.767
Fat reduction	2.09±0.58 2.33 (1-3)	2.19±0.50 2.33 (1-3)	2.27±0.52 2.33 (1-3)	p=0.443
Many food choices	2.13±0.46 2.00 (1-3)	2.07±0.32 2.00 (1.5-3)	2.17±0.42 2.25 (1.5-3)	p=0.532

Kruskal Wallis test was applied

4.6.2. Adherence to Recommendations for Meat and Meat Products, Eggs, Legumes, Nuts/Seeds

Of the 132 children included in our study; 32 (24.2%) were in poor adherence, 58 (43.9%) were in good adherence and 42 (31.8%) were in excessive intake group regarding to adherence to recommendations for meat and meat products. Adherences of subgroups of meat and meat products, eggs, legumes, nuts/seeds are shown in Table 4.14.

Table 4.14. Adherences of Subgroups

	Meat & Poultry n (%)	Fish n (%)	Egg n (%)	Lentils n (%)	Nuts/Seeds n (%)
Poor Adherence n (%)	35 (26.5)	78 (59.1)	46 (34.8)	47 (35.6)	17 (12.9)
Good Adherence n (%)	55 (41.7)	47 (35.6)	77 (58.3)	65 (49.2)	24 (18.2)
Excessive Intake n (%)	42 (31.8)	7 (5.3)	9 (6.8)	20 (15.2)	91 (68.9)

4.6.2.1 Factors Related with Adherence to Recommendations Meat and Meat Products

There was no significant difference between genders, age groups, BMIs of children and mothers, maternal age groups, caregivers and educational status of both parents regarding adherence to the recommendations. No significant difference was observed regarding number of children at the household, presence of older/younger siblings, frequency of eating in front of the screen, total time spent in front of the screen and frequency of family dinners per week ($p>0.05$). (Table 4.14.)

However statistically significant difference was found between BMI groups of fathers regarding adherence to the recommendations. Children of overweight fathers were significantly in excessive intake group ($p < 0.05$). (Table 4.15.).

Table 4.15. Factors Related with Adherence to Recommendations for Meat and Meat Products

	Poor adherence N (%)	Good adherence n (%)	Excessive Intake n (%)	Significance p
Gender:				
Girls	17 (53.1)	24 (41.4)	11 (26.2)	p=0.060
Boys	15 (46.9)	34 (58.6)	31 (73.8)	
Age:				
2	9 (28.1)	8 (13.8)	7 (16.7)	p=0.538
3	9 (28.1)	20 (34.5)	18 (42.9)	
4	6 (18.8)	14 (24.1)	10 (23.8)	
5	8 (25.0)	16 (27.6)	7 (16.7)	
BMI:				
Underweight	6 (18.8)	13 (22.4)	10 (23.8)	p=0.670
Normal weight	20 (62.5)	31 (53.4)	19 (45.2)	
Overweight	6 (18.8)	14 (24.1)	13 (31.0)	
Maternal BMI:				
Underweight	-	4 (6.9)	2 (4.8)	p=0.444
Normal weight	26 (81.3)	40 (69.0)	27 (64.3)	
Overweight	6 (18.8)	14 (24.1)	13 (31.0)	
Paternal BMI:				
Normal weight	13 (40.6)	20 (34.5)	5 (11.9)	p=0.011 *
Overweight	19 (59.4)	38 (65.5)	37 (88.1)	

Maternal age:				
<25	2 (6.3)	1 (1.7)	2 (4.9)	p=0.604
25-30	13 (40.6)	21 (36.2)	17 (41.5)	
31-35	10 (31.3)	21 (36.2)	17 (41.5)	
>36	7 (21.9)	15 (25.9)	5 (12.2)	
Number of children at the household				
1	27 (75.0)	37 (63.8)	26 (61.9)	p=0.253
2	7 (21.9)	21 (36.2)	16 (38.1)	
3	1 (3.1)	-	-	
Presence of older siblings				
Yes	5 (15.6)	9 (15.5)	6 (21.4)	p=0.709
No	27 (84.4)	49 (84.5)	33 (78.6)	
Presence of younger siblings				
Yes	3 (9.4)	8 (13.8)	4 (9.5)	p=0.827
No	29 (90.6)	50 (86.2)	38 (90.5)	
Education level of mother				
High school graduate	4 (12.5)	12 (20.7)	9 (21.4)	p=0.866
University graduate	21 (65.6)	36 (62.1)	25 (59.5)	
Post graduate	7 (21.9)	10(17.2)	8 (19.0)	
Education level of father				
1 (3.1)	1 (3.1)	-	-	p=0.837
Primary school graduate	6 (18.8)			
1 (65.6)	1 (65.6)	8 (13.8)	7 (16.7)	
High school graduate	4 (12.5)	41 (70.7)	30 (71.4)	
University graduate				
Post graduate		9 (15.5)	5 (11.9)	

Caregiver				
Mother	13 (40.6)	26 (44.8)	18 (42.9)	p=0.927
Family elder	6 (18.8)	6 (10.3)	7 (16.7)	
Caregiver	4 (12.5)	6 (10.3)	5 (11.9)	
Kinder garden	9 (28.1)	20 (34.5)	12 (28.6)	
Frequency of eating in front of the screen				
Never				p=0.126
Sometimes	5 (15.6)	22 (37.9)	12 (28.6)	
Frequently	11 (34.4)	20 (34.5)	19 (45.2)	
Always	9 (28.1)	8 (13.8)	8 (19.0)	
	7 (21.9)	8 (13.8)	3 (7.2)	
Total time spent in front of the screen				
Less than 1 hour				p=0.720
1 hour	7 (21.9)	20 (34.5)	13 (31.0)	
More than 1 hour	7 (21.9)	15 (25.9)	10 (23.8)	
More than 2 hours	12 (37.5)	12 (20.7)	10 (23.8)	
	6 (18.8)	11 (19.0)	9 (21.4)	
Frequency of family dinners per week				
Never				p=0.431
1-2	1 (3.1)	3 (5.2)	2 (4.8)	
3-4	1 (3.1)	5 (8.6)	2 (4.8)	
5-6	6 (18.8)	5 (8.6)	4 (9.5)	
6-7	2 (6.3)	14 (24.1)	8 (19.0)	
	22 (68.8)	31 (53.4)	26 (61.9)	

Chi-squared test was applied.

4.6.2.2. Infant Nutrition and Adherence to Recommendations for Meat and Meat Products

There was no significant difference observed between exclusive breastfeeding durations, total durations of breastfeeding and times of starting complementary feeding regarding adherence to the recommendations ($p > 0.05$). (Table 4.16.)

Table 4.16. Infant Nutrition and Adherence to Recommendations for Meat and Meat Products

	Poor adherence N (%)	Good adherence n (%)	Excessive intake n (%)	Significance P
Exclusive breastfeeding:				
<4 months	14 (43.8)	16 (27.6)	18 (42.9)	p=0.127
4-6 months	1 (3.1)	11 (19.0)	5 (11.9)	
6 months	15 (46.9)	20 (34.5)	13 (31.0)	
>6 months	2 (6.3)	11 (19.0)	6 (14.3)	
Total breastfeeding				
<6				p=0.133
7-12	10 (31.3)	12 (20.7)	12 (28.6)	
13-18	2 (6.3)	15 (25.9)	4 (9.5)	
19-23	8 (25.0)	12 (20.7)	6 (14.3)	
More than 2 years	4 (12.5)	10 (17.2)	6 (14.3)	
	8 (25.0)	9 (15.5)	14 (33.3)	
Complementary Feeding				
4-6 months	12 (37.5)	18 (31.0)	16 (38.1)	p=0.418
6 months	17 (53.1)	25 (43.1)	17 (40.5)	
>6 months	3 (9.4)	15 (25.9)	9 (21.4)	

Chi-squared test was applied.

4.6.2.3. Information Sources and Adherence to Recommendations for Meat and Meat Products

There was no significant difference in adherence between the frequency of used sources by families; pediatrician ($p=0.387$), dietician ($p=0.609$), relatives and family elders ($p=0.354$), friends ($p=0.686$), written sources ($p=0.576$), Facebook ($p=0.711$), Twitter ($p=0.838$), Instagram ($p=0.177$) and television ($p=0.321$). According to usefulness of the sources; no significant difference was found for dietician ($p=0.128$), relatives and family elders ($p=0.880$), friends ($p=0.584$), written sources ($p=0.238$), Facebook ($p=0.981$), Twitter ($p=0.956$), Instagram ($p=0.635$) and television ($p=0.704$).

However, proportion of, finding the information obtained from pediatrician as mostly useful was higher in parents of children having good adherence ($p=0.013$). (Table 4.17.)

Table 4.17. Usefulness of Pediatrician and Adherence to Recommendations for Meat and Meat Products

	Rarely useful	Sometimes useful	Mostly useful	Very useful
Poor Adherence n (%)	1 (3.1)	3 (9.4)	3 (9.4)	25 (78.1)
Good Adherence n (%)	-	10 (17.2)	17 (29.3)	31 (53.4)
Excessive Intake n (%)	1 (2.4)	2 (4.8)	5 (11.9)	34 (81.0)

Chi-squared test was applied.

4.6.2.4 Child Feeding Practices and Adherence to Recommendations for Meat and Meat Products

There was no significant difference between subgroups of the Parent Mealtime Action Scale regarding adherence to the recommendations ($p > 0.05$). (Table 4.18.)

Table 4.18. Parent Mealtime Action Scale and Adherence to Recommendations for Meat and Meat Products

	Poor Adherence	Good Adherence	Excessive Intake	p
	Mean±SD Med (Min-Max)	Mean±SD Med (Min-Max)	Mean±SD Med (Min-Max)	
Snack limits	2.32±0.78 2.66 (1-3)	2.51±0.62 2.66 (1-3)	2.42±0.59 2.66 (1-3)	p=0.445
Positive persuasion	2.31±0.47 2.50 (1.25-3)	2.28±0.44 2.50 (1.25-3)	2.26±0.47 2.37 (1.5-3)	p=0.896
Daily fruit and vegetable availability	2.67±0.38 2.83 (2-3)	2.63±0.43 2.66 (1.33-3)	2.59±0.44 2.66 (1.67-3)	p=0.789
Use of rewards	1.71±0.41 1.62 (1-2.5)	1.60±0.46 1.50 (1-3)	1.66±0.39 1.75 (1-2.5)	p=0.330
Insistence on eating	1.50±0.56 1.33 (1-3)	1.50±0.51 1.33 (1-3)	1.31±0.36 1.33 (1-2)	p=0.212
Snack modeling	1.43±0.44 1.33 (1-2.33)	1.37±0.41 1.33 (1-2.33)	1.43±0.43 1.33 (1-2.67)	p=0.684
Special meals	1.56±0.37 1.50 (1-2.25)	1.46±0.39 1.50 (1-2.5)	1.45±0.38 1.50 (1-2.5)	p=0.314
Fat reduction	2.11±0.50 2.33 (1-3)	2.16±0.53 2.33 (1-3)	2.26±0.57 2.33 (1-3)	p=0.321
Many food choices	2.21±0.44 2.25 (1-3)	2.12±0.39 2.00 (1.5-3)	2.04±0.37 2.00 (1.5-3)	p=0.102

Kruskal Wallis test was applied

4.6.3. Adherence to Recommendations for Fruits

Of the 132 children included in our study; 58 (43.9%) were in poor adherence, 41 (31.1%) were in good adherence and 33 (25.0%) were in excessive intake group regarding to adherence to recommendations on fruit consumption.

4.6.3.1 Factors Related with Adherence to Recommendations for Fruits

There was no significant difference between genders, age groups, BMIs of children and mothers', maternal age groups, caregivers and educational status of both parents regarding adherence to the recommendations. No significant difference was observed regarding number of children at the household, presence of older/ younger siblings, frequency of eating in front of the screen, total time spent in front of the screen and frequency of family dinners per week ($p>0.05$). (Table 4.19.)

However statistically significant difference was found between BMI groups of fathers regarding adherence to the recommendations. Children of overweight fathers were significantly in excessive intake group ($p<0.05$). (Table 4.19.)

Table 4.19. Factors Related with Adherence to Recommendations for Fruits

	Poor adherence N (%)	Good adherence n (%)	Excessive intake n (%)	Significance p
Gender:				p=0.507
Girls	26 (44.8)	15 (36.6)	11 (33.3)	
Boys	32 (55.2)	26 (63.4)	22 (66.7)	
Age:				p=0.426
2	12 (20.7)	7 (17.1)	5 (15.2)	
3	23 (39.7)	12 (29.3)	12 (36.4)	
4	8 (13.8)	14 (34.1)	8 (24.2)	
5	15 (25.9)	8 (19.5)	8 (24.2)	
BMI:				p=0.207
Underweight	17 (29.4)	5 (12.2)	7 (21.2)	
Normal weight	30 (51.7)	25 (61.0)	15 (45.5)	
Overweight	11 (19.0)	11 (26.8)	11 (33.3)	
Maternal BMI:				p=0.073
Underweight	3 (5.2)	3 (7.3)	-	
Normal weight	44 (75.9)	30 (73.2)	19 (57.6)	
Overweight	11 (19.0)	8 (19.5)	14 (42.4)	
Paternal BMI:				p=0.047*
Normal weight	19 (32.8)	15 (36.6)	4 (12.1)	
Overweight	39 (67.2)	26 (63.4)	29 (87.9)	
Maternal age:				p=0.888
<25	2 (3.5)	2 (4.9)	1 (3.0)	
25-30	26 (45.6)	13 (31.7)	12 (36.4)	
31-35	18 (31.6)	17 (41.5)	13 (39.4)	
>36	11 (19.3)	9 (22.0)	7 (21.2)	

Number of children at the household				
1				
2	38 (65.5)	28 (32.8)	21 (63.6)	p=0.975
3	19 (32.8)	13 (31.7)	12 (36.4)	
	1 (1.7)	-	-	
Presence of older siblings				
Yes	10 (17.2)	6 (14.6)	7 (21.2)	p=0.767
No	48 (82.8)	35 (85.4)	26 (78.8)	
Presence of younger siblings				
Yes	9 (15.5)	3 (7.3)	3 (9.1)	p=0.468
No	49 (84.5)	38 (92.7)	30 (90.9)	
Education level of mother				
High school graduate	11 (19.0)	7 (17.1)	7 (21.2)	p=0.974
University graduate				
Post graduate	37 (63.8)	26 (63.4)	19 (57.6)	
	10(17.2)	8 (19.5)	7 (21.2)	
Education level of father				
Primary school graduate	1 (1.7)	-	-	p=0.493
High school graduate	9 (15.5)	6 (14.6)	6 (18.2)	
University graduate				
Post graduate	41 (70.7)	26 (63.4)	25 (75.8)	
	7 (12.1)	9 (22.0)	2 (6.1)	

Caregiver				
Mother	20 (34.5)	21 (51.2)	16 (48.5)	p=0.576
Family elder	11 (19.0)	3 (7.3)	5 (15.2)	
Caregiver	7 (12.1)	5 (12.2)	3 (9.1)	
Kinder garden	20 (34.5)	12 (29.3)	9 (27.3)	
Frequency of eating in front of the screen				
Never				p=0.844
Sometimes	16 (27.6)	11 (26.8)	12 (36.4)	
Frequently	21 (36.29)	16 (39.0)	13 (39.4)	
Always	12 (20.7)	8 (19.5)	5 (15.2)	
	9 (15.6)	6 (14.6)	3 (9.1)	
Total time spent in front of the screen				
Less than 1 hour				p=0.827
1 hour	15 (25.9)	15 (36.6)	10 (30.3)	
More than 1 hour	17 (29.3)	7 (17.1)	8 (24.2)	
More than 2 hours	16 (27.6)	10 (24.4)	8 (24.2)	
	10 (17.2)	9 (22.0)	7 (21.2)	
Frequency of family dinners per week				
Never				p=0.352
1-2	2 (3.4)	3 (7.3)	1 (3.0)	
3-4	1 (1.7)	3 (7.3)	4 (12.1)	
5-6	8 (13.8)	5 (12.2)	2 (6.1)	
6-7	9 (15.5)	6 (14.6)	9 (27.3)	
	38 (65.5)	24 (58.5)	17 (51.5)	

Chi-squared test was applied.

4.6.3.2. Infant Nutrition Adherence to Recommendations for Fruits

There was no significant difference observed between exclusive breastfeeding durations, total durations of breastfeeding and times of starting complementary feeding regarding adherence to the recommendations ($p>0.05$). (Table 4.20.)

Table 4.20. Infant Nutrition and Adherence to Recommendations for Fruits

	Poor adherence N (%)	Good adherence n (%)	Excessive intake n (%)	Significance P
Exclusive breastfeeding:				
<4 months	21 (36.2)	13 (31.7)	14 (42.4)	p=0.743
4-6 months	7 (12.1)	8 (19.5)	2 (6.1)	
6 months	21 (36.2)	14 (34.1)	13 (39.4)	
>6 months	9 (15.5)	6 (14.6)	4 (12.1)	
Total breastfeeding				
<6				p=0.687
7-12	15 (25.9)	9 (22.0)	10 (30.3)	
13-18	10 (17.2)	5 (12.2)	6 (18.2)	
19-23	14 (24.1)	6 (14.6)	6 (18.2)	
More than 2 years	9 (15.5)	8 (19.5)	3 (9.1)	
	10 (17.2)	13 (31.7)	8 (24.2)	
Complementary feeding				
4-6 months	19 (32.8)	13 (31.7)	14(42.4)	p=0.589
6 months	27 (46.6)	17 (41.5)	15(45.5)	
>6 months	12 (20.7)	11 (26.8)	4(12.1)	

Chi-squared test was applied.

4.6.3.3. Information Sources and Adherence to Recommendations for Fruits

There was no significant difference in adherence between the frequency of used sources by families; pediatrician ($p=0.232$), dietician ($p=0.975$), relatives and family elders ($p=0.168$), friends ($p=0.528$), written sources ($p=0.065$), Facebook ($p=0.424$), Twitter ($p=0.325$), Instagram ($p=0.805$) and television ($p=0.415$). According to usefulness of the sources, no significant difference was found for pediatrician ($p=0.450$), dietician ($p=0.166$), relatives and family elders ($p=0.067$), friends ($p=0.963$), written sources ($p=0.846$), Facebook ($p=0.501$), Twitter ($p=0.298$), Instagram ($p=0.140$) and television ($p=0.80$).

4.6.3.4. Child Feeding Practices and Adherence to Recommendations for Fruits

Significant differences were found between subgroups of Parent Mealtime Action Scale regarding adherence to the recommendations. Use of “snack limits” by families was significantly higher in good adherence group compared to poor adherence ($p<0.05$). “Daily fruit and vegetable availability” was found to be higher in excessive intake group compared to poor adherence group ($p<0.05$).

No significant difference was found in other subgroups regarding adherence to the recommendations ($p>0.05$) (Table 4.21.)

Table 4.21. Parent Mealtime Action Scale and Adherence to Recommendations for Fruits

	Poor Adherence	Good Adherence	Excessive Intake	p
	Mean±SD Med (Min-Max)	Mean±SD Med (Min-Max)	Mean±SD Med (Min-Max)	
Snack limits	2.25±0.72 2.50 (1-3)	2.69±0.38 2.66 (1.67-3)	2.45±0.61 2.66 (1-3)	p=0.015 *
Positive persuasion	2.36±0.44 2.50 (1.25-3)	2.21±0.48 2.25 (1.25-3)	2.22±0.43 2.25 (1.5-3)	p=0.205
Daily fruit and vegetable availability	2.55±0.45 2.66 (1.33-3)	2.62±0.40 2.66 (1.67-3)	2.78±0.36 3.00 (1.67-3)	p=0.019 *
Use of rewards	1.73±0.40 1.75 (1-2.50)	1.56±0.48 1.50 (1-3)	1.60±0.38 1.50 (1-2.50)	p=0.086
Insistence on eating	1.53±0.42 1.33 (1-2.33)	1.31±0.37 1.33 (1-2.33)	1.44±0.46 1.33 (1-2.33)	p=0.215
Snack modeling	1.43±0.42 1.33 (1-2.33)	1.33±0.42 1.00 (1-2.33)	1.46±0.43 1.66 (1-2.67)	p=0.340
Special meals	1.52±0.42 1.50 (1-2.50)	1.40±0.36 1.25 (1-2.25)	1.50±0.34 1.50 (1-2.25)	p=0.332
Fat reduction	2.17±0.53 2.33 (1-3)	2.21±0.51 2.33 (1-3)	2.17±0.57 2.33 (1-3)	p=0.948
Many food choices	2.15±0.42 2.25 (1-3)	2.01±0.33 2.00 (1.5-2.75)	2.19±0.42 2.00 (1.50-3)	p=0.093

Kruskal Wallis test was applied

4.6.4. Adherence to Recommendations for Vegetables

Of the 132 children included in our study, 106 (80.3 %) were in poor adherence and 26 (19.7%) were in good adherence group. There was no excessive intake group in adherence to recommendations regarding to vegetable consumption.

4.6.4.1. Factors Related with Adherence to Recommendations for Vegetables

There was no significant difference between genders, age groups, maternal and paternal BMIs, maternal age groups, caregivers and educational status of both parents regarding adherence to the recommendations. No significant difference was observed regarding number of children at the household, presence of older/ younger siblings and frequency of eating in front of the screen, total time spent in front of the screen and frequency of family dinners per week ($p>0.05$). (Table 4.22.)

However, significant difference was observed between BMI groups of children regarding adherence to the recommendations. Children having good adherence were more overweight ($p<0.05$).

Table 4.22. Factors Related with Adherence to Recommendations for Vegetables

	Poor adherence n (%)	Good adherence n (%)	Significance P
Gender:			
Girls	43 (40.6)	9 (34.6)	p=0.578
Boys	63 (59.4)	17 (65.4)	
Age:			
2	18 (17.0)	6 (23.1)	p=0.820
3	37 (34.9)	47 (35.6)	
4	25 (23.6)	5 (19.2)	
5	26 (24.5)	5 (19.2)	
BMI:			
Underweight	27 (25.5)	2 (7.7)	p=0.011*
Normal weight	58 (54.7)	12 (46.2)	
Overweight	21 (19.8)	12 (46.2)	
Maternal BMI:			
Underweight	3 (2.8)	3 (11.5)	p=0.095
Normal weight	74 (69.8)	19 (73.1)	
Overweight	29 (27.4)	4 (15.4)	
Paternal BMI:			
Normal weight	32 (30.2)	6 (23.1)	p=0.473
Overweight	74 (69.8)	20 (76.9)	
Maternal age:			
<25	3 (2.9)	2 (7.7)	(p=0.056)
25-30	43 (41.0)	8 (30.8)	
31-35	34 (32.4)	14 (53.8)	
>36	25 (23.8)	2 (7.7)	
Number of children at the household			
1	68 (64.2)	19 (73.1)	p=0.593

2	37 (34.9)	7 (26.9)	
3	1 (0.9)	-	
Presence of older siblings			
Yes			p=0.760
No	19 (17.9)	4 (15.4)	
	87 (82.1)	22 (84.6)	
Presence of younger siblings			
Yes	14 (13.2)	1 (3.8)	p=0.178
No	92 (86.8)	25 (96.2)	
Education level of mother			
High school graduate			
University graduate	17 (16.0)	8 (30.8)	p=0.222
Post graduate	69 (65.1)	13 (50.0)	
	20 (18.9)	5 (19.2)	
Education level of father			
Primary school graduate			
High school graduate	1 (0.9)	-	p=0.638
University graduate	15 (14.2)	6 (23.1)	
Post graduate	75 (70.8)	17 (65.4)	
	15 (14.2)	3 (11.5)	
Caregiver			
Mother	44 (41.5)	13 (50.0)	
Family elder	15 (14.2)	4 (15.4)	p=0.468
Caregiver	11 (10.4)	4 (15.4)	
Kinder garden	36 (34.0)	5 (19.2)	

Frequency of eating in front of the screen			
Never	27 (25.5)	12 (46.2)	p=0.255
Sometimes	42 (39.6)	8 (30.8)	
Frequently	20 (18.9)	5 (19.2)	
Always	17 (16.1))	1 (3.8)	
Total time spent in front of the screen			
Less than 1 hour	27 (25.5)	40 (30.3)	p=0.070
1 hour	26 (24.5)	32 (24.2)	
More than 1 hour	29 (27.4)	34 (25.8)	
More than 2 hours	24 (22.6)	26 (19.7)	
Frequency of family dinners per week			
Never	3 (2.8)	3 (11.5)	p=0.421
1-2	7 (6.6)	1 (3.8)	
3-4	13 (12.3)	2 (7.7)	
5-6	20 (18.9)	4 (15.4)	
6-7	63 (59.4)	16 (61.5)	

Chi-squared test was applied.

4.6.4.2. Infant Nutrition and Adherence to Recommendations for Vegetables

There was no significant difference observed based on exclusive breastfeeding duration, total duration of breastfeeding and age of starting complementary feeding regarding adherence to the recommendations. ($p>0.05$) (Table 4.23.)

Table 4.23. Infant Nutrition and Adherence to Recommendations for Vegetables

	Poor adherence n (%)	Good adherence n (%)	Significance p
Exclusive breastfeeding:			
<4 months			
4-6 months	40 (37.7)	8 (30.8)	
6 months	12 (11.3)	5 (19.2)	
>6 months	41 (38.7)	7 (26.9)	p=0.263
	13 (12.3)	6 (23.1)	
Total breastfeeding			
<6	27 (25.5)	7 (26.9)	
7-12	17 (16.0)	4 (15.4)	
13-18	21 (19.8)	5 (19.2)	
19-23	17 (16.0)	3 (11.5)	p=0.989
More than 2 years	24 (22.6)	7 (26.9)	
Complementary Feeding			
4-6 months			
6 months	36 (34.0)	10 (38.5)	
>6 months	50 (47.2)	9 (34.6)	p=0.468
	20 (18.9)	7 (36.9)	

Chi-squared test was applied.

4.6.4.3. Information Sources and Adherence to Recommendations for Vegetables

There was no significant difference in adherence between the frequency of used sources by families; pediatrician (p=0.842), dietician (p=0.697), relatives and family elders (p=0.087), friends(p=0.080), written sources (p=0.183), Facebook (p=0.690) Twitter (p=0.929), Instagram (p=0.078) and television (p=0.958).

According to usefulness of the sources, no significant difference was found between pediatrician (p=0.864), dietician (p=0.931), relatives and family elders (p=0.096), friends

($p=0.318$), written sources ($p=0.595$), Twitter ($p=0.225$), Instagram ($p=0.314$) and television regarding adherence to the recommendations ($p=0.222$).

However, families of children in good adherence group less benefit from Facebook compared to families of children having poor adherence ($p=0.042$) (Table 4.24.)

Table 4.24. Usefulness of Facebook and Adherence to Recommendations for Vegetables

	Not useful	Rarely useful	Sometimes useful	Mostly useful
<80 n (%)	67 (63.2)	28 (26.4)	8 (7.5)	3 (2.8)
80-120 n (%)	24 (92.3)	2 (7.7)	-	-

Chi-squared test was applied.

4.6.4.4. Child Feeding Practices and Adherence to Recommendations for Vegetables

According to Parent Mealtime Action Scale; “use of rewards” and “insistence on eating” were significantly higher in children having poor adherence compared to good adherence regarding adherence to the recommendations ($p<0.05$). Families of children having good adherence used ‘fat reduction’ significantly low compared to poor adherence group ($p<0.05$). There was no significance in other subgroups regarding adherence to the recommendations ($p>0.05$) (Table 4.25.)

Table 4.25. Parent Mealtime Action Scale and Adherence to Recommendations for Vegetables

	Poor Adherence	Good Adherence	p
	Mean±SD Med (Min-Max)	Mean±SD Med (Min-Max)	
Snack limits	2.39±0.66 2.66 (1-3)	2.65±0.45 3 (1.67-3)	p=0.075
Positive persuasion	2.31±0.45 2.50 (1.50-3)	2.16±0.46 2.25 (1.25-3)	p=0.115
Daily fruit and vegetable availability	2.61±0.42 2.66 (1.33-3)	2.73±0.43 3 (1.67-3)	p=0.101
Use of rewards	1.71±0.41 1.75 (1-2.50)	1.38±0.40 1.25 (1-2.25)	p<0.001*
Insistence on eating	1.48±0.50 1.33 (1-3)	1.28±0.41 1 (1-2.33)	p=0.034*
Snack modeling	1.40±0.42 1.33 (1-2.67)	1.43±0.42 1.33 (1-2.33)	p=0.667
Special meals	1.50±0.39 1.50 (1-2.50)	1.40±0.36 1.37 (1-2.25)	p=0.280
Fat reduction	2.37±0.40 2.33 (1.33-3)	2.14±0.55 2.33 (1-3)	p=0.026*
Many food choices	2.13±0.41 2.00 (1-3)	2.05±0.33 2.00 (1.5-2.75)	p=0.398

Mann-Whitney U test was applied

4.6.5. Adherence to Recommendations for Bread and Cereals

Of the 132 children included in our study, 90 (68.2%) were in poor adherence, 36 (27.3%) were in good adherence and 6 (4.5%) were in excessive intake group regarding adherence to recommendations on bread and grains consumption. Comparisons were made between good and poor adherence groups with 126 children, since the number of children in excessive intake group was low.

4.6.5.1. Factors Related with Adherence to Recommendations for Bread and Cereals

There was no significant difference between genders, age groups, BMIs of children and mothers', maternal age groups, caregivers and educational status of both parents regarding adherence to the recommendations. No significant difference was observed regarding number of children at the household, presence of older/younger siblings and frequency of eating in front of the screen, total time spent in front of the screen and frequency of family dinners per week ($p > 0.05$). (Table 4.26.)

However, significant difference was observed between paternal BMIs regarding adherence to the recommendations. Paternal BMI of children in good adherence group was significantly higher than children in poor adherence group ($p < 0.05$). (Table 4.26.)

Table 4.26. Factors Related with Adherence to Recommendations for Bread and Cereals

	Poor adherence n (%)	Good adherence n (%)	Significance P
Gender:			
Girls	35 (38.9)	15 (41.7)	p=0.773
Boys	55 (61.1)	21 (58.3)	
Age:			
2	18 (20.0)	6 (16.7)	p=0.235
3	37 (41.1)	9 (25.0)	
4	17 (18.9)	11 (30.6)	
5	18 (20.0)	10 (27.8)	
BMI:			
Underweight	24 (26.7)	5 (13.9)	p=0.097
Normal weight	50 (55.6)	19 (52.8)	
Overweight	16 (17.8)	12 (33.3)	
Maternal BMI:			
Underweight	6 (6.7)	-	p=0.157
Normal weight	66 (73.3)	25 (69.4)	
Overweight	18 (20.0)	11 (30.6)	
Paternal BMI:			
Normal weight	31 (34.4)	6 (16.7)	p=0.048*
Overweight	59 (65.6)	30 (83.3)	
Maternal age:			
<25	3 (3.4)	1 (2.8)	p=0.682
25-30	36 (40.4)	13 (36.1)	
31-35	34 (38.2)	12 (33.3)	
>36	16 (18.0)	10 (27.8)	
Number of children at the household			
1	60 (66.7)	22 (61.1)	p=0.669

2	29 (32.2)	14 (38.9)	
3	1 (1.1)	-	
Presence of older siblings			p=0.882
Yes	16 (17.8)	6 (16.7)	
No	74 (82.2)	30 (83.3)	
Presence of younger siblings			p=0.297
Yes	9 (10.0)	6 (16.7)	
No	81 (90.0)	30 (83.3)	
Education level of mother			p=0.905
High school graduate	16	7	
University graduate	56	23	
Post graduate	18	6	
Education level of father			p=0.399
Primary school graduate	1 (1.1)	-	
High school graduate	10 (11.1)	8 (22.2)	
University graduate	66 (73.3)	23 (63.9)	
Post graduate	13 (14.4)	5 (13.9)	
Caregiver			p=0.091
Mother	40 (44.4)	13 (36.1)	
Family elder	12 (13.3)	7 (19.4)	
Caregiver	14 (15.6)	1 (2.8)	
Kinder garden	24 (26.7)	15 (41.7)	
Frequency of eating in front of the screen			p=0.355
Never	23 (25.6)	15 (41.7)	
Sometimes	36 (40.0)	12 (33.3)	

Frequently	18 (20.0)	5 (13.9)	
Always	13 (14.4)	4 (11.1)	
Total time spent in front of the screen			
Less than 1 hour	28 (31.1)	11 (30.6)	p=0.500
1 hour	19 (21.1)	12 (33.3)	
More than 1 hour	24 (26.7)	7 (19.4)	
More than 2 hours	19 (21.1)	6 (16.7)	
Frequency of family dinners per week			
Never	3 (3.3)	3 (8.3)	p=0.731
1-2	6 (6.7)	2 (5.6)	
3-4	12 (13.3)	3 (8.3)	
5-6	15 (16.7)	7 (19.4)	
6-7	54 (60.0)	21 (58.3)	

Chi-squared or Fisher exact test was applied.

4.6.5.2 Infant Nutrition and Nutrition and Adherence to Recommendations for Bread and Cereals

There was no significant difference observed between exclusive breastfeeding durations, total durations of breastfeeding and times of starting complementary feeding regarding adherence to the recommendations ($p>0.05$). (Table 4.27.)

Table 4.27. Infant Nutrition and Adherence to Recommendations for Bread and Cereals

	Poor adherence n (%)	Good adherence n (%)	Significance P
Exclusive breastfeeding:			
<4 months			
4-6 months	31 (34.4)	15 (41.7)	p=0.412
6 months	15 (16.7)	2 (5.6)	
>6 months	31 (34.4)	14 (38.9)	
	13 (14.4)	5 (13.9)	
Total breastfeeding			
<6	28 (31.1)	5 (13.9)	p=0.078
7-12	10 (11.1)	10 (27.8)	
13-18	16 (17.8)	9 (25.0)	
19-23	15 (16.7)	5 (13.9)	
More than 2 years	21 (23.3)	7 (19.4)	
Complementary Feeding			
4-6 months	32 (35.6)	13 (36.1)	p=0.978
6 months	39 (43.3)	16 (44.4)	
>6 months	19 (21.1)	7 (19.4)	

Chi-squared test was applied.

4.6.5.3 Information Sources and Adherence to Recommendations for Bread and Cereals

There was no significant difference in adherence between the frequency of used sources by families; pediatrician (p=0.073), dietician (p=0.518) relatives and family elders (p=0.359) friends (p=0.376), written sources (p=0.077), Facebook (p=0.943), Twitter (p=0.495), Instagram (p=0.397) and television (p=0.167). According to usefulness of the sources, no significant difference was found for pediatrician (p=0.954), dietician (p=0.106),

relatives and family elders (p=0.160), friends (p=0.607), written sources (p=0.076), Facebook (p=0.907), Twitter (p=0.958), Instagram (p=0.822), and television (p=0.432)

4.6.5.4 Child Feeding Practices and Adherence to Recommendations for Bread and Cereals

There was no significant difference between subgroups of the Parent Mealtime Action Scale regarding adherence to the recommendations (p>0.05). (Table 4.28.)

Table 4.28. Parent Mealtime Action Scale and Adherence to Recommendations for Bread and Cereals

	Poor Adherence	Good Adherence	P
	Mean±SD Med (Min-Max)	Mean±SD Med (Min-Max)	
Snack limits	2.49±0.62 2.66 (1-3)	2.36±0.62 2.66 (1.67-3)	p=0.166
Positive persuasion	2.25±0.48 2.25 (1.25-3)	2.42±0.35 2.50 (1.50-3)	p=0.063
Daily fruit and vegetable availability	2.59±0.44 2.66 (1.33-3)	2.75±0.35 3 (1.67-3)	p=0.082
Use of rewards	1.66±0.42 1.62 (1-2.75)	1.64±0.44 1.50 (1-3)	p=0.606
Insistence on eating	1.39±0.47 1.33 (1-3)	1.53±0.51 1.33 (1-3)	p=0.100
Snack modeling	1.38±0.41 1.33 (1-2.33)	1.41±0.40 1.33 (1-2.67)	p=0.692

Special meals	1.51±0.38 1.50 (1-2.50)	1.38±0.40 1.25 (1-2.50)	p=0.066
Fat reduction	2.20±0.57 2.33 (1-3)	2.14±0.43 2.33 (1-3)	p=0.396
Many food choices	2.08±0.38 2.00 (1-3)	2.14±0.40 2.00 (1.5-3)	p=0.521

Mann-Whitney U test was applied

4.6.5.5. Characteristics of Excessive Intake Group

Of the 6 children in exceeding group: 4 were male and 2 were female; 3 of them were 5, 2 of them were 4 and 1 of them was 3 years old; 5 of them were overweight and 1 was at normal weight; 2 of them had a mother with normal weight and 4 had an overweight mother; 5 of the fathers were overweight and 1 was normal weight.

4.6.6. Adherence to Recommendations for Water

Of the 132 child included in our study, 86 (67.4%) of them were in poor adherence, 41 (31.1%) were in good adherence and only 2 (1.5%) of them were in excessive intake group. Comparisons were made between poor and good adherence groups with 130 children, since the number of children in excessive intake group was low.

4.6.6.1 Factors Related with Adherence to Recommendations for Water

Significant difference was observed between genders, age groups, BMI of children and fathers regarding adherence to the recommendations ($p < 0.05$). Boys showed higher adherence compared to girls. Having good adherence was significantly higher in 5 year olds. Children in good adherence group were significantly more overweight. Furthermore, fathers of children having good adherence were significantly overweight/had higher BMI.

However, there was no significant difference between maternal BMI groups, maternal age groups, caregivers and educational status of both parents regarding adherence to the recommendations. No significant difference was observed regarding number of children at the household, presence of older/younger siblings and frequency of eating in front of the screen, total time spent in front of the screen and frequency of family dinners per week ($p>0.05$). (Table 4.29.)

Table 4.29. Factors Related with Adherence to Recommendations for Water

	Poor adherence n (%)	Good adherence n (%)	Significance P
Gender:			
Girls	46 (51.7)	6 (14.6)	$p<0.001^*$
Boys	43 (48.3)	35 (85.4)	
Age:			
2	19 (21.3)	5 (12.2)	$p=0.045$
3	37 (41.6)	10 (24.4)	
4	17 (19.1)	12 (29.3)	
5	16 (18.0)	14 (34.1)	
BMI:			
Underweight	22 (24.7)	7 (17.1)	$p=0.006^*$
Normal weight	52 (59.6)	17 (41.5)	
Overweight	14 (15.7)	17 (41.5)	
Maternal BMI:			
Underweight	5 (5.6)	1 (2.4)	$p=0.130$
Normal weight	66 (74.2)	25 (61.0)	
Overweight	18 (20.2)	15 (36.6)	
Paternal BMI:			
Normal weight	33 (37.1)	4 (9.8)	$p=0.001^*$
Overweight	56 (62.9)	37 (90.2)	

Maternal age:			
<25	1 (1.1)	4 (9.8)	p=0.087
25-30	33 (37.5)	18 (43.9)	
31-35	34 (38.6)	13 (31.7)	
>36	20 (22.7)	6 (14.6)	
Number of children at the household			
1	61 (68.5)	25 (61.0)	p=0.605
2	27 (30.3)	16 (39.0)	
3	1 (1.1)	-	
Presence of older siblings			
Yes	18 (20.2)	4 (9.8)	p=0.139
No	71 (79.8)	37 (90.2)	
Presence of younger siblings			
Yes	7 (7.9)	8 (19.5)	p=0.053
No	82 (92.1)	33 (80.5)	
Education level of mother			
High school graduate	17 (19.1)	8 (19.5)	p=0.371
University graduate	59 (66.3)	23 (56.1)	
Post graduate	13 (14.6)	10 (24.4)	
Education level of father			
Primary school graduate			p=0.284
High school graduate	1 (1.1)	-	
University graduate	11 (12.4)	10 (24.4)	
Post graduate	63 (70.8)	27 (65.9)	
	14 (15.7)	4 (9.8)	

Caregiver			
Mother	39 (43.8)	16 (39.0)	p=0.935
Family elder	12 (13.5)	7 (17.1)	
Caregiver	10 (11.2)	5 (12.2)	
Kinder garden	28 (31.5)	13 (31.7)	
Frequency of eating in front of the screen			
Never	25 (28.1)	14 (34.1)	p=0.116
Sometimes	29 (32.6)	19 (46.3)	
Frequently	19 (21.3)	6 (14.6)	
Always	16 (18.0)	2 (4.9)	
Total time spent in front of the screen			
Less than 1 hour	26 (29.2)	14 (34.1)	p=0.462
1 hour	22 (24.7)	10 (24.4)	
More than 1 hour	20 (22.5)	12 (29.3)	
More than 2 hours	21 (23.6)	5 (12.2)	
Frequency of family dinners per week			
Never	3 (3.4)	3 (7.3)	p=0.055
1-2	3 (3.4)	5 (12.2)	
3-4	13 (14.6)	2 (4.9)	
5-6	19 (21.3)	4 (9.8)	
6-7	51 (57.3)	27 (65.9)	

Chi-squared or Fisher exact test was applied.

4.6.6.2 Infant Nutrition and Adherence to Recommendations for Water

There was no significant difference between exclusive breastfeeding durations, total durations of breastfeeding and introduction times of complementary feeding regarding adherence to the recommendations ($p>0.05$). (Table 4.30.)

Table 4.30. Infant Nutrition and Adherence to Recommendations for Water

	Poor adherence n (%)	Good adherence n (%)	Significance P
Exclusive breastfeeding:			
<4 months	36 (40.4)	12 (29.3)	p=0.660
4-6 months	10 (11.2)	6 (14.6)	
6 months	31 (34.8)	16 (39.0)	
>6 months	12 (13.5)	7 (17.1)	
Total breastfeeding			
<6	27 (30.3)	7 (17.1)	p=0.385
7-12	13 (14.6)	7 (17.1)	
13-18	15 (16.9)	11 (26.8)	
19-23	15 (16.9)	5 (12.2)	
More than 2 years	19 (21.3)	11 (26.8)	
Complementary Feeding			
4-6 months	29 (32.6)	16 (39.0)	p=0.454
6 months	43 (48.3)	15 (36.6)	
>6 months	17 (19.1)	10 (24.4)	

Chi-squared test was applied.

4.6.6.3 Information Sources and Adherence to Recommendations for Water

There was not significant difference in adherence between the frequency of used sources by families; pediatrician ($p=0.997$), dietician ($p=0.915$), relatives and family elders ($p=0.439$) friends ($p=0.528$), written sources ($p=0.052$), Facebook ($p=0.228$), Twitter ($p=0.802$), Instagram ($p=0.055$) and television ($p=0.076$). According to usefulness of the sources, no significant difference was found for pediatrician ($p=0.455$), dietician ($p=0.266$), relatives and family elders ($p=0.070$), friends ($p=0.054$), written sources ($p=0.872$), Facebook ($p=0.094$), Twitter ($p=0.177$), Instagram ($p=0.085$) and television ($p=0.325$).

4.6.6.4. Child Feeding Practices and Adherence to Recommendations for Water

There was no significant difference between subgroups of the Parent Mealtime Action Scale regarding adherence to the recommendations ($p>0.05$). (Table 4.31.)

Table 4.31. Parent Mealtime Action Scale and Adherence to Recommendations for Water

	Poor Adherence	Good Adherence	P
	Mean$\pm$SD Med (Min-Max)	Mean$\pm$SD Med (Min-Max)	
Snack limits	2.35 $\pm$ 0.69 2.66 (1-3)	2.61 $\pm$ 0.45 2.66 (1.67-3)	$p=0.053$
Positive persuasion	2.30 $\pm$ 0.46 2.50 (1.25-3)	2.28 $\pm$ 0.45 2.50 (1.25-3)	$p=0.836$
Daily fruit and vegetable availability	2.65 $\pm$ 0.40 2.66 (1.67-3)	2.62 $\pm$ 0.42 3 (1.67-3)	$p=0.873$
Use of rewards	1.63 $\pm$ 0.40 1.50 (1-2.50)	1.68 $\pm$ 0.48 1.75 (1-3)	$p=0.638$

Insistence on eating	1.46±0.50 1.33 (1-3)	1.42±0.47 1.33 (1-2.33)	p=0.621
Snack modeling	1.40±0.41 1.33 (1-2.33)	1.44±0.45 1.33 (1-2.67)	p=0.674
Special meals	1.47±0.41 1.50 (1-2.50)	1.51±0.33 1.50 (1-2.25)	p=0.428
Fat reduction	2.15±0.50 2.33 (1-3)	2.26±0.57 2.33 (1-3)	p=0.100
Many food choices	2.14±0.40 2.00 (1-3)	2.09±0.38 2.00 (1.5-3)	p=0.658

Mann-Whitney U test was applied

4.6.6.5. Characteristics of Excessive Intake Group:

Two of the children in exceeding group were boys. Ages of children in exceeding group were 4 and 5 years. Children in exceeding group were both overweight. While maternal BMI was normal for both children in exceeding group, paternal BMIs were normal and overweight. Maternal age groups of children in exceeding group were 31-35 and >36.

4.6.7. Adherence to Total Dietary Recommendations

Adherence to dietary recommendations of TÜBER was calculated by the average of adherences to food groups; milk and dairy, meat and meat products, fruits, vegetables, bread, grains and water. Of the 132 children included in our study, 63 (47.7%) were classified as having poor adherence, 65 (49.2%) as good adherence, and 4 (3.0%) were in excessive intake group regarding to adherence to dietary recommendations. Comparisons were made between good adherence and poor adherence groups with 128 children, since the number of children in excessive intake group was low.

4.6.7. 1. Factors Related with Adherence to Total Dietary Recommendations

There was no significant difference between genders, age groups, maternal and paternal BMIs, maternal age groups, caregivers and educational status of both parents regarding adherence to the recommendations ($p>0.05$). However, significant difference was observed between child's BMIs regarding adherence to the recommendations. Children with good adherence had significantly higher BMI compared to others and children in poor adherence group was significantly underweight ($p<0.05$).

No significant difference was observed regarding number of children at the household and presence of younger siblings regarding adherence to the recommendations ($p>0.05$). However, children with older sibling showed significantly good adherence ($p<0.05$). No significant difference was observed in total time spent in front of the screen and frequency of family dinners regarding adherence to the recommendations ($p>0.05$). On the other hand, children having less frequency of eating in front of the screen had significantly good adherence ($p<0.05$). (Table 4.32.)

Table 4.32. Factors Related with Adherence to Total Dietary Recommendations

	Poor adherence n (%)	Good adherence n (%)	Significance P
Gender:			
Girls	26 (41.3)	25 (38.5)	p=0.746
Boys	37 (58.7)	40 (61.5)	
Age:			
2	14 (22.2)	10 (15.4)	p=0.740
3	22 (34.9)	24 (36.9)	
4	13 (20.6)	17 (26.2)	
5	14 (22.2)	14 (21.4)	
BMI:			
Underweight	18 (28.6)	11 (16.9)	p=0.037*
Normal weight	36 (57.1)	33 (50.8)	
Overweight	9 (14.3)	21 (32.3)	
Maternal BMI:			
Underweight	3 (4.8)	3 (4.6)	p=0.947
Normal weight	46 (73.0)	46 (70.8)	
Overweight	14 (22.2)	16 (24.6)	
Paternal BMI:			
Normal weight	23 (36.5)	14 (21.5)	p=0.062
Overweight	40 (63.5)	51 (78.5)	
Maternal age:			
<25	3 (4.8)	2 (3.1)	p=0.635
25-30	27 (43.5)	22 (33.8)	
31-35	21 (33.9)	26 (40.0)	
>36	11 (17.7)	15 (23.1)	
Number of children at the household			
1	45 (71.4)	39 (60.0)	p=0.161

2	17 (27.0)	26 (40.0)	
3	1 (1.6)	-	
Presence of older siblings			
Yes	7 (11.1)	16 (24.6)	p=0.047*
No	56 (88.9)	49 (75.4)	
Presence of younger siblings			
Yes	8 (12.7)	6 (9.2)	p=0.530
No	55 (87.3)	59 (90.8)	
Education level of mother			
High school graduate	11 (17.5)	13 (20.0)	p=0.165
University graduate	44 (69.8)	36 (55.4)	
Post graduate	8 (12.7)	16 (24.6)	
Education level of father			
Primary school graduate			p=0.715
High school graduate			
University graduate	1 (1.6)	-	
Post graduate	8 (12.7)	12 (18.5)	
	45 (71.4)	44 (67.7)	
	9 (14.3)	9 (13.8)	
Caregiver			
Mother	27 (42.9)	28 (43.1)	p=0.545
Family elder	12 (19.0)	7 (10.8)	
Caregiver	6 (9.5)	9 (13.8)	
Kinder garden	18 (28.6)	21 (32.3)	

Frequency of eating in front of the screen			
Never	13 (20.6)	26 (40.0)	p=0.005*
Sometimes	22 (34.9)	28 (43.1)	
Frequently	15 (23.8)	7 (10.8)	
Always	13 (20.6)	4 (6.2)	
Total time spent in front of the screen			
Less than 1 hour	16 (25.4)	24 (36.9)	p=0.341
1 hour	14 (22.2)	17 (26.2)	
More than 1 hour	19 (30.2)	13 (20.0)	
More than 2 hours	14 (22.2)	11 (16.9)	
Frequency of family dinners per week			
Never	3 (4.8)	3 (4.6)	p=0.939
1-2	5 (7.9)	3 (4.6)	
3-4	7 (11.1)	7 (10.8)	
5-6	10 (15.9)	13 (20.0)	
6-7	38 (60.3)	39 (60.0)	

Chi-squared or Fisher exact test was applied.

4.6.7.2. Infant Nutrition Infant Nutrition and Adherence to Total Dietary Recommendations

There was no significant difference observed between exclusive breastfeeding durations, total durations of breastfeeding and times of starting complementary feeding regarding adherence to the recommendations ($p>0.05$). (Table 4.33.)

Table4.33. Infant Nutrition and Adherence to Total Dietary Recommendations

	Poor adherence n (%)	Good adherence n (%)	Significance P
Exclusive breastfeeding:			
<4 months			p=0.916
4-6 months	21 (33.3)	25 (38.5)	
6 months	9 (14.3)	8 (12.3)	
>6 months	24 (38.1)	22 (33.8)	
	9 (14.3)	10 (15.4)	
Total breastfeeding			
<6	21 (33.3)	11 (16.9)	p=0.105
7-12	6 (9.5)	14 (21.5)	
13-18	14 (22.2)	12 (18.5)	
19-23	10 (15.9)	10 (15.4)	
More than 2 years	12 (19.0)	18 (27.7)	
Complementary Feeding			
4-6 months	21 (33.3)	23 (35.4)	p=0.759
6 months	30 (47.6)	27 (41.5)	
>6 months	12 (19.0)	15 (23.1)	

Chi-squared test was applied.

4.6.7.3. Information Sources and Adherence to Total Dietary Recommendations

There was no significant difference in adherence between the frequency of used sources by families; pediatrician (p=0.094), dietician (p=0.883), relatives and family elders (p=0.346), friends (p=0.377), written sources (p=0.135) Facebook (p=0.229) Twitter (p=0.811), Instagram (p=0.245), and television (p=0.920). According to usefulness of the sources, no significant difference was found for dietician (p=0.100), relatives and family

elders, (p=0.237), friends (p=0.065), written sources (p=0.192), Facebook (p=0.094), Twitter (p=0.879), Instagram (p=0.141) and television (p=0.634).

The rate of finding the information obtained from pediatrician as useful was higher in parents of children having good adherence (p=0,042). (Table 4.34.)

Table 4.34. Usefulness of Pediatrician and Adherence to Total Dietary Recommendations

	Rarely useful	Sometimes useful	Mostly useful	Very useful
Poor adherence n (%)	2 (3.2)	9 (14.3)	16 (25.4)	36 (57.1)
Good adherence n (%)	-	6 (9.2)	8 (12.3)	51 78.5)

Chi-squared test was applied.

4.6.7. 4.Child Feeding Practices and Adherence to Total Dietary Recommendations

According to adherence regarding Parent Mealtime Action Scale, “use of rewards” and “special meals” was found to be significantly higher in poor adherence group. “Daily fruit and vegetable availability” was significantly higher in good adherence group (p<0.05). No significant difference was found in other subgroups (p>0.05) (Table 4.35.)

4.6.7. 5. Characteristics of Excessive Intake Group

Of the 4 children in exceeding group: 3 were boys and 1 was girl; 3 of them were 5, 1 of them was 3 years old; 3 of them were overweight and 1 was at normal weight; 1 of them had a mother with normal weight and 3 had an overweight mother; 3 of the fathers were overweight and 1 was at normal weight.

Table 4.35. Parent Mealtime Action Scale and Adherence to Total Dietary Recommendations

	Poor Adherence	Good Adherence	P
	Mean±SD Med (Min-Max)	Mean±SD Med (Min-Max)	
Snack limits	2.39±0.70 2.66 (1-3)	2.53±0.53 2.66 (1-3)	p=0.420
Positive persuasion	2.34±0.47 2.50 (1.25-3)	2.23±0.44 2.25 (1.25-3)	p=0.153
Daily fruit and vegetable availability	2.57±0.41 2.66 (1.67-3)	2.69±0.43 3 (1.33-3)	p=0.046*
Use of rewards	1.75±0.43 1.75 (1-2.75)	1.55±0.40 1.50 (1-3)	p=0.008*
Insistence on eating	1.49±0.56 1.33 (1-3)	1.37±0.39 1.33 (1-2.33)	p=0.516
Snack modeling	1.42±0.41 1.33 (1-2.33)	1.36±0.42 1.33 (1-2.67)	p=0.347
Special meals	1.55±0.38 1.50 (1-2.50)	1.40±0.38 1.25 (1-2.50)	p=0.018*
Fat reduction	2.13±0.54 2.33 (1-3)	2.26±0.50 2.33 (1-3)	p=0.142
Many food choices	2.13±0.43 2.00 (1-3)	2.07±0.35 2.00 (1.5-3)	p=0.491

Mann-Whitney U test was applied

5. DISCUSSION AND CONCLUSION

5.1 Factors Related with Adherence to Recommendations

Highest number of children was in normal weight group and most of the mothers were at normal weight whereas 71.2% of fathers were overweight. Highest proportion of the children (43.2%) had been taken care by their mothers which was in accordance with other studies done in Turkey (41, 55). It was followed by kinder garden (31.1%) and elder family member (14.4%). Highest proportion (59.8%) of the families stated the frequency of family dinners as always which is desirable since it is encouraged in order to prevent childhood obesity (66, 67).

According to total screen time, more than half (54.5%) of the sample meet the recommendations of World Health Organization; which states that sedentary screen time for children aged 2-5 years old should not be more than 1 hour (72). Furthermore, WHO states that less than one hour is better and 30.3% of the sample stated total duration of screen time as less than an hour.

5.2 Infant Nutrition

Most of the children (58.4 %) were breastfed for 1 year or longer. This shows that this sample meet the recommendations of American Academy of Pediatrics on continuation of breastfeeding for 1 year or longer, which is agreed by the WHO and the Institute of Medicine (53).

Highest number of children (44.7%) started complementary feeding at 6 months and 34.8% of children started between 4-6 months. There was not any children starting before 4 months and proportion of starting after 6 months was 20.5% which was the least proportion. This shows that higher proportion of this sample meets the recommendation of The European Society for Pediatric Gastroenterology Hepatology and Nutrition (ESPGHAN) (53) and United States Department of Agriculture (USDA) on not introducing complementary foods before 4 months and not to delay it beyond 6 months (13).

5.3. Used Information Sources

Results revealed that families mostly consulted to pediatricians and highest proportion of the sample think pediatricians are the most beneficial sources of information on child nutrition. Since the socioeconomic status level of our sample was high, accessibility to the pediatricians may be easier and which may not reflect the population. Although less than half of the sample stated frequent consultation to dietitian, when parents were asked how beneficial they find these sources; most of them (higher than 70%) stated as useful. This shows that although parents benefit from dietitians, they do not think them as a primary source for child nutrition. Although social media was not used frequently compared to other sources, most frequently used and most useful social media platform was stated as Instagram related to child nutrition and parents stated that they use Instagram for children recipes.

5.4. Child Feeding Practices

Most used behavior by parents was found as ‘daily fruit and vegetable intake’ which is similar with findings of Arslan (74). Reason of this finding may be due to high level of educational status of parents. For instance, maternal education level was found to be significantly associated with food variety and fruit - vegetable variety in 2 year olds (18). Similarly according to Cooke et al. (2003), children who had higher educated mothers consumed more vegetables than lower educated mothers. However, this relationship did not seen on fruit consumption (22). Similarly, study which used data from Quebec Longitudinal Study of Child Development and investigated representative sample of 275 children aged 4 years showed that; consumption of fruit and vegetables was related with mother’s education. Consumption was significantly higher among children with mothers graduated from university compared to children of mothers with no high-school diploma (12). Similarly, according to Burnier et al. (2011), 4 years old children with mothers having university degree were more likely to be exclusively breastfed for 4 or more months, which was associated with consuming 2 or more servings of vegetables per day (23). This

relationship is observed in older children as well. Study observing 12,490 children aged 11 to 24 years old found that children of parents with lower educational level were more likely to drink soft drinks, watch TV and less likely to eat fruit and vegetables (29). Furthermore, according to Roos et al. (2002), household education level was strongly associated with vegetable consumption in a sample of 65,059 adolescents with mean age of 15 (28). Another reason can be that, consumption of vegetable dishes and salads are common in Aegean region, where Izmir is located (81). This food culture may contributed to fruits and vegetables availability at homes.

5.5. Adherences to Recommendations

5.5.1. Adherence to Recommendations for Milk and Dairy Products

Results indicated that most of the children consume milk and dairy everyday. Total consumption amount of milk and dairy products was approximately 6 portions per week. TÜBER indicates that it should be 2 - 2.5 portions per day, resulting 14 - 17.5 portions per week depending on age and gender (7). It shows that this sample consume below recommendations similar to other studies (7, 12). Among milk and dairy products, the most consumed one was found as yogurt and the least was cheese.

Even though they do not meet recommendations in general, highest amount of children (38.6%) were in good adherence group related to recommendations for milk and dairy products. According to data of TBSA, in Turkey; consumption frequencies within and above recommendations were 27.1% and 22% for boys, 24% and 18% for girls in 2-3 and 4-6 age groups respectively (7). This indicates that this sample is in better adherence to milk and dairy recommendations compared to Turkey population.

5.5.2. Adherence to Recommendations for Meat and Meat Products, Eggs, Legumes, Nuts/Seeds

Consumption amount of chicken and meat was approximately 3, fish 1, egg 3, legumes 1 and nuts/seeds 1.75 to 3.5 portions per week. According to recommendations of TÜBER; meat and poultry should be 1.75 - 5.25, eggs 3.5, fish 0.6 - 1.5, legumes 1 - 2 and seeds 1 - 1.75 per week depending on age and gender of children. Findings show that children exceed the recommendations on nuts/seeds.

Related to adherences; children showed the highest adherence to recommendations on egg consumption (58.3%), followed by legumes (49.2%) and meat & poultry (41.7%). In these groups, highest amount of children were in good adherence group. However, adherence to fish recommendation was mostly poor (59.1%) which may indicate that fish is the least preferable group in meat and meat products among children. Also, during the interviews it was found that families give the least importance to fish consumption among other meat and meat products.

43.9% of this sample was good adherence group. Comparing to findings of TBISA; frequency of 2 - 3 years old children consuming within and above the recommendation was only 7% for both genders, 8% for 4 - 6 years old boys and 5% for 2 - 3 years old girls (7), it can be said that our sample is more adhering to recommendations compared to generalization of Turkey. This may be due to our sample was taken from a private health care center in İzmir, which is a province having the third highest income level in Turkey and in a district where generally people with high socioeconomic status live in (82). Also, parental educational status was high as 62.1% of mothers and 69.7% of fathers were university graduate.

5.5.3. Adherence to Recommendations for Fruits & Vegetables

Most of the children consume fruit (70.5%) and vegetables (53.8%) everyday. Consumption amount of vegetables was approximately 6 portions whereas fruits were 10 portions per week. TÜBER recommends 10.5 - 14 portions for fruits and 7 - 14 portions for

vegetables per week depending on age and gender (7). These findings illustrate that even though children do not meet the recommendations, they have higher preference for fruits compared to vegetables. Our results relates to findings of Wardle et al. on vegetables being the least preferred while fruits were the most (30). Birch et al. (1999) stated that children prefer sweet and salty tastes whereas reject sour and bitter tastes prenatally (34) which may be an explanation of rejecting vegetables while accepting fruits more easily.

Proportion of children in poor adherence group for vegetable consumption (80,3%) was higher than children in poor adherence group for fruits (43.9%). Furthermore, there was not excessive intake group in adherence to vegetable recommendations. Poor adherences to recommendations on fruit and vegetables were in concordance with other studies. 2-3 years old group has the highest frequency for consuming fruit and vegetable below the recommended level for both genders in Turkey (7) and it is similar around the world (17, 21-24).

From face to face interviews, it was observed that the major problem and concern of parents was vegetable consumption of their children. However, it was also seen that they do not offer enough while literature states that consumption of vegetables may be increased with repeated exposure (83).

5.5.4. Adherence to Recommendations for Bread and Cereals

Most of the children consume bread (68.9%) and cereals (57.6%) everyday. Consumption amount of bread was approximately 5 portions while cereals were approximately 7 portions per week. TÜBER recommends 17.5 to 21 portions a week depending on age and gender. It can be seen that this group consumed blow recommended level. Calculations showed that, 68.2% of the children had poor adherence to recommendations for bread and cereals.

The possible reason for consuming bread and cereals below the recommended level is most people think that carbohydrates are unhealthy and related with obesity. From face to face interviews, it was observed that parents are not willing to give bread, bulgur or rice to their children to prevent them from getting used to these foods.

5.5.5. Adherence to Recommendations for Water

Water consumption of children was 1056.81 ± 358.04 ml per day while recommendations are 1300 ml for 2-3 years and 1600 for 4-6 years. 67.4% of the children in sample were in poor adherence group. This result is similar to findings of TBISA (2010) on inadequate consumption of water in Turkey which is; 61.91% and 65.2% for boys and 64% and 71.3% for girls in 2-3 and 4-6 year age groups respectively (7). However, these findings are better than findings of Guelinckx et al., who studied intake of water of children and adolescents aged 4 -17 in 13 countries and found the highest mean intakes as 738 ± 567 ml/day (25).

Possible reason for poor adherence to consumption of water may be that parents do not give enough importance on offering their children water. One reason for that may be the low consumption of water of parents themselves since nearly half of the adult population consumed water within and above Adequate Intake(AI) (Figure 2.28). Another reason which deducted from interviews was that mothers gave higher importance on milk, fresh fruit juices or soups related to fluid intake. As an evidence, Guelinckx et al. stated that intake of milk and juice was higher among children, whereas adolescents consumed more water, hot beverages, soft drinks and alcoholic beverages (25). Considering that water is the preferred fluid, consumption should be encouraged and it should be substituted for calorie dense beverages.

5.5.7. Adherence to Total Dietary Recommendations

Regarding adherence to total dietary recommendations; proportion of good adherence was 49.2% followed by poor adherence with 47.7%. It can be said that this sample was moderately adhered to dietary recommendations. Excessive intake was seen in only 3% of children. Since these families have high level of education, they may have behaved to prevent obesity. Also, this may be due to high socioeconomic status (SES) of

this sample. According to review of McLaren, obesity was found to be positively associated with low socioeconomic status (84). This may be the reason of unhealthy food choices of parents with low SES. According to data of TBSA(2010), of 2567 children aged 0-5 years , 8.5% were obese, 17.9% were overweight, 10.3% were underweight and 5.6% were severely underweight in Turkey (55). So, this study sample may not reflect Turkey population and further studies should be conducted with lower educational and SES level of parents. However, number of children with poor adherence was as high as children with good adherence. As can be derived from literature and interviews from families, children have picky eating behaviors in these ages. “Picky eating” defines as eating and feeding problems, mostly occurred in children and a common problem during childhood especially in preschool children. Cardona et al. (2014) found that nearly half of the 4018 children aged 1.5, 3, and 6 years old were “picky eaters” during early childhood (58). Food neophobia which is defined as fearing from new, one of the characteristics of picky eating; usually peaks at the age of 2 and then starts to decline with age (85). For instance, Nicklaus et al. (2004) stated increased preference for vegetables for the same subjects from the age of 2-3 to following years (4). So the reason of the high proportion of poor adherence in this group may be related to the phase that children are going through.

5.6. Factors Affecting Dietary Adherences

5.6.1. Gender

Only significant difference in adherences between genders was found for consumption of water ($p<0.001$). Boys showed higher adherence compared to girls. Similarly, according to data of TBSA, even though women in general consume water higher than men, in 2-5 age group, boy’s frequencies of consumption within and above the Adequate Intake (AI) were higher than girls (7) (Figure 2.4.). Findings on difference between genders may be the result of preschool boys being more active than girls (86), thus consume more water during the day. Also, boys are more likely to have unhealthy food habits such as consuming more junk foods (38). Junk foods containing high salt or sugar

may cause the increase in consumption of water among boys. However, systematic review conducted by France et al. (2018) found that evidence was inconsistent for association between water consumption and child's gender among children aged 2 to 12 years (87). Significant difference between genders appears to increase as children grows older because at preschool period, caregiver is the primary responsible for consumed foods and children start to make their own food choices as they grow older. This may be the reason of finding no significance in other food groups.

5.6.2. Age

Only significant difference in adherence by ages was found regarding consumption of water. Having good adherence to recommendations was significantly higher in 5 year olds ($p=0.045$). This result conflicts with the finding of TBSA which showed that frequency of consumption decreases for both genders between 2-3 and 4-5 years age groups (7). Systematic review conducted by France et al. (2018) found that evidence was inconsistent for association between water consumption and child's age among children aged 2 to 12 years (87). Increased consumption of water could be a result of changed diet throughout the years. Kranz S, Siega-Riz (2002) showed that as the child aged, consumption of added sugar increased in a sample of children 2 to 5 years olds (30). Another longitudinal study suggested that consumption of processed foods increased over time; between the time points of 3 to 9 years of ages (6). With the increased consumption of salt and sugar, consumption of water might be increased. Another explanation can be given as 2 year olds may be still breast feeding so they do not drink water as recommended amounts. There was not any significance between ages in other food groups. This might be because of the narrow age range of the study sample.

5.6.3. BMI

Studies investigating the relationship between food intakes and BMI found conflicting results. Study by Boumtje et al. used the data obtained from the USDA's 1994–

96 and 1998 Continuing Survey of Food Intakes by Individuals (CSFII) and included 5–18 years old children. Study revealed that consumption of vegetables, grains and meat products did not found to be correlated with weight status of school-aged children (34). Similarly, 3-4 years old children was followed for 3 years from 1986 to 1989 and results indicated that dietary factors were not associated with BMI across the three study years (37). On the other hand, Lin and Morrison (2002) used data from the Continuing Survey of Food Intakes by Individuals (CSFII) and stated that overweight boys ate less vegetables, fruits and white potatoes than normal-weight and at-risk-of-overweight boys. Similarly, overweight and at-risk-of-overweight girls ate less fruit. However, there was no significant difference in vegetable or white potato intake for girls (36). Consumption of low fat milk, dairy products, fruits and legumes was inversely associated with the probability of being at risk for overweight (34). Systematic review conducted by France et al. (2018) found that evidence was inconsistent for association between water consumption and child's BMI among children aged 2 to 12 years (87).

According to our findings for milk and dairy products, children who have normal weight were significantly in good adherence group ($p=0.027$). Children in poor adherence group were significantly underweight while children in excessive intake group were significantly overweight. Also, children having good adherence to recommendations for vegetables ($p=0.011$) and water ($p=0.006$) had significantly higher BMI while being underweight was significantly low in children adhering to recommendations. Also, children in exceeding group for water consumption, which did not included in comparisons, were both overweight while there was no excessive intake group in vegetable consumption. For total dietary intakes; in poor adherence group, proportion of children who were underweight was significantly higher than overweight children. In good adherence group, proportion of children who were overweight was significantly higher than underweight children. Furthermore, of the 4 children who were in excessive intake group but did not involved in the comparisons, 3 of them were overweight and 1 was at normal weight. This indicates that we do not see a lot of underweight children who are adhering to the recommendations and significantly do not see overweight children who are adhering poorly ($p=0.037$).

These findings may indicate that children who are adhering poorly to dietary recommendations may have higher risk of being underweight and children who have excessive intakes have higher risk of being overweight.

Regarding to children adhering to recommendations, they have low risk of being underweight but may be normal or overweight which can be affected by many other factors. Being overweight does not have to be associated with unhealthy dietary habits. Families of overweight children are considered to have less knowledge on healthy food consumption. However, this may not be the case. There are many factors of childhood obesity so the reason of good adhering children to be overweight does not have to mean that they are consuming unhealthy foods. For instance, systematic review conducted by Silventoinen et al. showed that genetic factors had a strong effect on BMI of children and adolescents (88). Also, sugar consumption was evaluated apart from these food groups. So the contribution of sugar consumption may be the reason of being overweight for children in good adherence group. Another reason can be the physical activity level of these children. For instance, Jago et al. stated that physical activity and TV viewing were the only significant predictors of BMI among 3-7 years of children (37). Being overweight may be the result of having low physical activity levels rather than excessive consumption of foods. Additionally, these ages of children tend to consume less, inadequate and in less variety due to picky eating behaviors (89) which is conducted from both literature and from this study. So children who consume in recommended amounts are children with appetent. This may be the case of consuming more.

5.6.4. Paternal BMI

Among the factors analyzed, most significant factor was found to be paternal BMI. Children of overweight fathers were significantly in excessive intake group according to adherences to milk and dairy ($p=0.008$), meat and meat products ($p=0.011$) and fruits ($p=0.047$). In other words, in excessive intake groups, proportion of children of overweight father was significantly higher. These findings reveal that children of fathers with normal weight are less likely to exceed recommendations of milk and dairy, meat and meat

products and fruits. Also, paternal BMI of children in good adherence group was significantly higher than children in poor adherence group according to bread ($p=0.048$) and water ($p=0.001$) consumption. In other words, in good adherence intake groups, proportion of children of overweight father was significantly higher. These reveal that children of overweight fathers consumed bread and water according to recommendations. This may either be resulted from good adherence of fathers regarding bread and water consumption or it can be that their eating behavior had an increasing effect on child's consumption which is otherwise will be poor, similar with higher proportion of the sample.

Wardle et al. (2001) showed the relationship between food intake of the child and parental BMI of 4 to 5 years old children. Children of obese/overweight parents had higher preference for fatty foods, have lower liking of vegetables and higher desire for sweetened drinks, whereas there was no difference for protein, fruits and desserts (45). According to Wardle et al. (2001), one of the reasons of this relationship is that children of overweight and/or obese parents are more likely to eat related to emotional cues (45). This may be the reason of excessive intake of these food groups. Also, foods which are available at the house are common. Study which investigated children at the time periods of 2, 4 and 5 years of age showed that greater proportion of children drinking 1 serving of sugar sweetened beverages per day had a mother who was overweight/obese compared to infrequent or nondrinker children (33). Another reason of this relationship is sharing the same environment. For instance, according to Wardle et al., children of obese or overweight parents have stronger preference for sedentary lifestyle and more likely to spend time on sedentary actives like watching TV and spending hours on computer (45). Additionally, it is believed that children of overweight and/or obese parents may feed their children different than normal weighted parents. Parents having higher BMI are more likely to have restrained dietary habits for themselves and more likely to restrain their children's access to palatable foods. This may increase the unhealthy food consumption/eating behavior of children (90).

However, we expected to find a more significant difference according to mother's BMI rather than fathers since mothers are the primary caretakers of children according to studies done in Turkey and this sample. Our findings show us that even though mothers are

the primary caregivers and may spend more time with their children, fathers have significant influence on their child's diet as well. The reason of this may be due to patriarchal structure of Turkey and father is perceived as most powerful figure at the house (91). Also, due to COVID-19 pandemic, which occurred during the data collection of this study, working from home became more common and this might increase time spent by fathers at home.

5.6.5. Presence of Older Siblings

We expected to see poor adherence in children having older sibling due to increased number of children at the household thus decreased attention given to the child. For instance, according to a meta-analysis in Spain that observed 2-24 years old individuals, two or more siblings at home was associated with higher risk for nutritional inadequacy, independent of socio-economic status (31). Similarly, study investigating 2 year olds showed that intake of fruit and vegetables is low among children who have older siblings compared to others (18). According to Avon Longitudinal Study of Parents and Children (ALSPAC) study, having an older sibling was inversely associated with traditional diet pattern composed of meat and vegetables (27). Also, older children tend to eat healthier foods. So, children with older siblings may be influenced by their healthy eating behaviors and availability of junk foods at home. For example, eating high fat processed foods and high sugar content foods was positively associated with having older siblings for 4 year olds (38). ALSPAC study indicated that 3 years old children with older siblings were more likely to consume junk and snack foods compared to only children (27). However, our results indicated that children with older siblings showed significantly good adherence to total average dietary recommendations ($p=0.047$). This can be due to increased parental knowledge of parents. Beliefs and attitudes of parents may change between firstborns and later born. As parents get older, their attitudes about child feeding practices can change due to their experiences and they may develop healthier feeding practices. For instance, in a study where mothers were asked to complete interviews after their first and second born children, they scored slightly but significantly higher at their second parenting scores. This

showed that mothers improved on parenting knowledge between their first and second child (39). This may be the reason of children with older siblings having good adherence to total dietary recommendations.

5.6.6. Screen Time

5.6.6.1. Eating in front of the TV

Children having less frequency of eating in front of the screen had significantly good adherence to total dietary intake recommendations ($p=0.005$). This was an expected finding since eating in front of the screen has been associated with unhealthy eating habits. Cross sectional study conducted with a random sample of 3534 individuals aged 2–24 years old indicated that watching TV during meals was a risk factor for nutritional inadequacy (31). Television viewing during meals was significantly associated with consuming high fat and high sugar containing foods in a sample of 15144 children aged 2–9 in IDEFICS study (76). Similarly, consumption of unhealthy foods like pizza/salty snacks and soda were higher among children in families with television on during 2 or more meals per day (78). Also, it can decrease the communication during family dinner which may otherwise be beneficial to teach the benefits of foods or motivate eating healthy foods. Study that investigated children in fourth, fifth and sixth grade found that children from families who watched television during 2 or more meals per day consumed grains, fruit, green and yellow vegetables, potatoes, beans, and nuts, chicken, eggs, and fish less frequently and consumed more red meat and processed foods compared with children who watched TV while eating meal less than 2 times a day or none (78). According to Sweetman et al. (2011), watching TV during main meal was associated with lower intake and liking of vegetables (71). Moreover, TV or screen may reduce the attention given to food thus parents may start to provide easy- prepared foods. For instance, number of nights in a week which parents served quick suppers was found to be related to the presence of TV watching during meals (78). Similarly, serving fruit and vegetable was inversely correlated with the frequency of family meals which TV was on (68).

On the other hand, based on the face to face interviews, parents of picky eater children reported that they try to make their child eating while he/she was paying attention to something else, even though they knew that it was unhealthy. They stated that it was easier to feed their children when their attention was on something else like tablets, TV or smart phones. However, children should not get used to eat in front of screen for developing healthy eating behavior.

5.6.7 Infant Nutrition

5.6.7 .1 Exclusive Breastfeeding

Exclusive breastfeeding is important because various flavors in breast milk increases the acceptance during infancy and may have a facilitating effect during childhood. In this sample, children who were exclusively breastfed for more than 4 months were significantly in good adherence group for milk consumption ($p=0.047$). Shim et al. (2011) stated that, exclusive breastfeeding duration for 6 months had lowered the picky eating behaviors such as: preference for specific preparation methods, food rejection and neophobia in a sample of children aged 2 to 3 years old (92). For instance, Buriner et al. (2011) stated that, 4 years old children who were breastfed exclusively for 4 or more months were more likely to consume two or more servings of vegetables per day (23). Another explanation can be given as mothers who exclusively breastfed for more than 4 months may be more careful about healthy eating. For instance, Pesa and Shelton found that mother's consumption of 5 or more portions of fruits and/or vegetables daily was significantly associated with breastfeeding (93). So, mothers having healthy eating behaviors for themselves may encourage their children to consume according to recommendations.

5.6.8. Information Sources:

Television is one of the most used mass media sources and it is frequently used to deliver health information to public. In our sample, television was found to be less beneficial for families with children adhering to recommendations to milk and dairy consumption ($p = 0.015$) and these families stated significantly less frequent use of television as an information source for child nutrition ($p = 0.030$). This may indicate that parents of children in poor adherence group trust the information they gain from TV which may not be accurate. People should be suspicious about the recommendations given on television. For instance, Korownyk et al. (2014) investigated the recommendations given by Dr. Oz, who is a heart surgeon, during his TV show watched by millions of Americans. They investigated given recommendations and found that evidence supported 46% of his recommendations while 15% was contradicted and no supporting evidence was found for 36% (94). Also, parents should be careful watching television since advertisements target children and adolescents for marketing unhealthy foods and snacks (95). While these advertisements attract children's attention on these palatable foods, they can also make parents believe that these foods are actually made for kids and are healthy.

Another finding related to information sources show that families of children in good adherence group regarding vegetable consumption less benefit from Facebook compared to families of children having poor adherence ($p=0.042$). This revealed that children of families benefiting from Facebook about child nutrition did not adhere to recommendations. Internet can be a source of misleading information. For instance, Hirasawa et al. conducted a study in 2013 to investigate the misleading information on the internet. With the keyword of "healthy diet", information on websites was compared to dietary guidelines as a reference. Hirasawa et al. found the mean matching score of recommendations of guidelines with all analyzed websites ranging from 33.5% to 47.2% and concluded that internet information about "healthy diet" was partially follow the

guidelines (96). Internet sources may not be reliable and accurate since anyone is able to publish and share information and can give advice on healthy eating.

On the other hand, the rate of finding the information obtained from pediatrician as useful was higher in parents of children having good adherence to total dietary recommendations ($p=0.042$) and recommendations on meat and meat products ($p=0.013$). This indicated that getting advice on child nutrition from a reliable and beneficial source may have positive effect on child's diet. Parents should find trustful sources on child nutrition.

5.6.9 Child Feeding Practices

5.6.9.1. Snack Limits

Children tend to prefer foods that are high in sugar and fat (97). Data show that children's sugar and fat consumptions are higher than recommended values (1). With the increase of childhood obesity (8) and advertisements of palatable foods (95), parents try to find solutions to limit or decrease the consumption of unhealthy foods. One of the most used children feeding strategy is restriction. Parents restrict unhealthy foods to their children aiming that it will cause child's disliking.

According to child feeding practices, use of 'snack limits'; which assesses the restrictions put by parents, was significantly higher in good adherence group regarding to fruit consumption compared to poor adherence group ($p=0.015$). This indicated that children of families who put higher restrictions showed higher adherence to fruit consumption. This subgroup evaluates the restrictions put on consumption of desserts, sugar sweetened beverages and salty snacks. So, parents who restricted unhealthy snack choices might have encourage their children to eat healthy snacks, which are mostly considered as fruits.

5.6.9.2. Daily Fruit and Vegetable Availability

Daily fruit and vegetable availability, which assesses the behaviors of parents about the amount of fruits and vegetables which consumed by themselves and their children was found to be higher in excessive intake group compared to poor adherence group regarding fruit consumption ($p=0.019$). Also, it was significantly higher in good adherence group compared to poor regarding total dietary adherence ($P=0.046$). This subgroup contains statements as “I gave fruit to my child each day”, “I ate fruit each day” and “I ate vegetables each day”. These assess availability of fruits and vegetables at home and parents’ own consumption. Our result is in concordance with findings of other studies using Parent Mealtime Action Scale. Both Hendy et al. (2009) and Arslan (2012) stated that children’s fruit and vegetable consumption was associated with “Daily fruit and vegetable availability” (74, 75).

Preschool aged children mainly spend their time at home so availability of healthy foods at home becomes important for healthy food consumption. Meta analysis done by Yee et al. (2017) revealed that more than half of the studies found a positive relationship between food availability at home and healthy food consumption. Most of the studies found that availability of healthy foods, non availability of unhealthy foods and parents’ control on availability of unhealthy foods at home is associated with healthy eating. These brought to the conclusion of availability and/or control of availability of foods at home is influential on infant’s food consumption (64). Similarly, a cross sectional study conducted in Australia found significant positive association between children’s fruit-vegetable intake and variety of fruit-vegetables available at home (98). Furthermore, according to ALSPAC study, frequency of home-prepared fruit and vegetable consumption at the age of 6 months was positively correlated with fruit and vegetable consumption even at 7 years old children (17).

Also, parents affect children’s healthy food intake by role modeling. Meta analysis done by Yee et al. (2017) concluded that; most of the studies which investigated the

relationship between role modeling and food consumption of children found a positive relationship (64). Wyse et al. (2011) stated that there is a statistically significant positive association between children's fruit and vegetable consumption per day with parents eating fruit or vegetables in front of their children (98). Children's vegetable consumption was most strongly predicted by the similarity of child and parents' food consumption on the main meal (71). Likewise Fisher et al. (2002) and Cooke et al. (2003) found a positive association between parents' and children's fruit and vegetable consumption (22, 99).

So, our finding on total dietary adherence shows the importance of availability and role modeling on children's healthy food intake and adherence to dietary recommendations. However, our findings also show that children may consume excessive amount of fruits when these foods are available and parents consume fruits regularly. This may be because of the excessive consumption of fruits by parents, which is not assessed in this study. For instance, mother's regular soft drink and sweet consumption was found to be related to likelihood of children's daily soft drink and sweet consumption (44). Similarly, Hendy et al. (2009) and Arslan (2012) showed that snack consumption of children was positively associated with snack consumption of parents (74, 75). These findings showed that parents influence their child's unhealthy food consumption by role modeling as well. So they should be careful about their own consumption.

In the light of these results, one of the reasons of low adherence to dietary recommendations among preschool children can be said that the low adherences of their parents.

5.6.9.3. Reward Use

Parents try to control their child's food intake by rewarding them. This reward can be a favorite food or an activity for finishing a meal or eating a healthy food. However, according to self determination theory, achieving something for the reward may decrease the intrinsic motivation. So, child can see it as a chore, to receive the reward (64).

"Use of rewards" was significantly higher in children having poor compared to good adherence to vegetable ($p < 0.001$) and total dietary recommendations ($p = 0.008$). "Use

of rewards” evaluates the activities or foods that parents offer in order to persuade their children to eat. It consists statements as: “I made eating the food a game or fun for the child”, “I gave the child a favorite food as a reward for good behavior.”, “I offered the child a toy or favorite activity as a reward for eating” and “I offered the child a special dessert as a reward for eating.”

High use of rewards in poor adherence group may be the result of parents’ trying to find solution in order to make their children to eat vegetables. However, a meta-analysis conducted in 2017 demonstrated that large majority of studies found non significant relationship between using food as a reward and healthy eating behavior while some found a negative relationship (64).

Also, giving rewards may increase the preference and liking of food which is used as a reward rather than targeted food. For instance, according to Vereecken et al. (2004), 2-7 years old children’s likelihood of daily sweet consumption was positively correlated with mother’s use of food as a reward (44). Meta analysis conducted by Yee et al. (2017) showed that 6 out of 10 studies found a positive relationship between using food as a reward and unhealthy food consumption (64). Arslan (2012) indicated that use of rewards was related to increased consumption of snack foods (74). So, children’s preference for healthy foods may be decreased with this behavior of their parents.

However, rewarding with praise was found to be different from rewarding with material instruments. According to Yee et al. (2017), among 7 studies that observed effect of rewarding with praise on healthy food consumption, 4 found a positive relationship (64). Similarly, Hendy et al. (2009) stated that mothers of children who had healthier diets use more positive persuasion (75). Another review indicates that non-food tangible rewards such as stickers and non tangible rewards such as praise may have positive effect on trying new foods. So, Cooke et al. (2011) suggested cautious use of rewards to promote the acceptance of healthy foods (100).

Although there was no significant difference between “positive persuasion” and dietary adherences in this study, it may be a better way. For instance, Cooke et al. (2011) stated that rewards had positive effect in the case of increasing food intake but may have

negative effect on increasing the liking of that food (100). So, in order to make a permanent change in child's diet, rewarding with praise and positive persuasion can be used.

5.6.9.4. Insistence on Eating

According to findings, parents of children in poor adherence group for vegetable consumption used "insistence on eating" significantly higher compared to parents of children in good adherence group ($p=0.034$). "Insistence on eating" evaluates the pressure that parents put on their children to eat. It consists of statements as "I insist my child to eat even if he/she said 'I'm not hungry'". "I insist my child to eat when he/she was sleepy, not feeling well." and "I insisted my child to eat when he/she was emotionally upset". Explanation to this finding may be that parents try to increase their children's vegetable intake by pressuring. For instance, in the study of Francis et al (2001), mothers of 5 years old girls stated that they use more pressure on their child about eating when their daughters were thinner and they perceive them as underweight (101). Even though relationship between BMI and insistence on eating did not evaluated in this study, it shows that mothers may put pressure on their children in the case they perceive them as inadequate. However, meta-analysis done by Yee et al. (2017) stated that even though there were studies which found a positive association, most of the studies found a negative or non-association between pressuring and healthy eating (64).

5.6.9.5. Fat Reduction

Families of children having good adherence used 'fat reduction' significantly lower compared to children with poor adherence regarding vegetable consumption ($p=0.026$). This subgroup evaluated parent's restrictions on their child's eating by the statement: "I stopped my child from eating too much" and fat limitation behaviors with statements such as "I made changes to my child's food to lower animal fat" and "I made changes to my own food to lower animal fat".

Parents of children adhering to recommendations on vegetable consumption did not stop their children in the case of excessive eating. According to Francis et al (2001), mothers reported using more restrictive feeding practices when they were concerned about their own or daughter's weight, more invested in eating issues, perceived daughters as overweight and when daughters were heavier. Francis et al. indicated that parents whom fear that their children may be overweight in the future may attempt to limit their food intake (80). So, it can be stated that parents of children adhering to recommendations did not have concerns on their child's weight or eating. Also, these parents did not believe that lowering animal fat is necessary for healthy diet. These findings and observations from interviews revealed that parents usually concern about their child's food intakes when their child's BMI is high. These parents might not have concerns on their child's BMI due to their good adherences so they did not see a need to lower fat or make them stop eating.

On the other hand, poor adherence of children might be the result of high fat reduction among parents. If parent's fat reduction behaviors on their child's or own diet was perceived from children as dieting, children might lower the consumption amount of foods. For instance, Abramovitz and Birch (2000) stated that even 5 year old girls had ideas about dieting. Furthermore, girls whose mothers reported recent or current dieting were more than twice as likely to have ideas about dieting compared to other girls. These points out that daughter's ideas and beliefs on eating behavior may influence from mothers dieting (102). So, poor adherences of children may be the result of parent's restrained eating behaviors.

5.6.9.6. Special Meals

"Special meals" was found to be significantly higher in poor adherence to total dietary recommendations ($p=0.018$). It evaluates whether a special meal is prepared for the children different from family members. It consists of statements as "I ate the same foods as those offered to my child", "I sat with my child, but did not eat." "I prepared a special meal to my child, different from the family meal." I placed some of each food on my child's plate."

Parents of children having poor adherence try to come up with solutions to get their children to eat. According to Carruth et al. (2000) and Jacobi et al. (2008), parents of picky eater children offer foods different from the family meal (103, 104). With their concern about child's growth and development, mothers generally have a thought of "He/she should eat anything as long as he/she eats, no matter what". This may then be resulted with unhealthy food consumption of the child. Furthermore, this behavior of parents may be resulted with refusal of unliked foods for longer time.

5.7. Other Factors Evaluated

Maternal BMI, maternal age, number of children at the household, presence of younger sibling, educational level of parents, caregiver, total screen time of children, frequency of family dinners, total breastfeeding duration, timing of complementary feeding and some of the subgroups of Parent Mealtime Action Scale; positive persuasion, snack modeling and many food choices did not show any significant difference in adherence to dietary recommendations of any food groups that have been analyzed.

As a conclusion, it can be said that some of the child and familial characteristics, screen time habits, infant nutrition, sources that used by families and child feeding practices have an impact on child's food intake and adherence to dietary recommendations. It is important to raise awareness of families on the importance of these factors. In the light of this study, mothers and caregivers can be educated by the health providers about these practices.

5.8. Limitations

Dietary intake of children was assessed by Food Frequency Questionnaire during face to face interviews. So, parents may underreport or over report the amounts of foods eaten by their children.

Sample was taken from a private health care center in a district where generally people with high socioeconomic status live. So, results may not reflect the population.

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7. APPENDICES

7.1. Ethical Approval



Sayı : 37068608-6100-15- 1815
Konu: Klinik Araştırmalar
Etik kurul Başvurusu hk.

30/01/2020

İlgili Makama (Rakel Rital Alaluf)

Yeditepe Üniversitesi Sağlık Bilimleri Fakültesi Beslenme ve Diyetetik Dr. Öğr. Üyesi Binnur Okan Bakır'ın sorumlu araştırmacı olduğu **“İzmir’de Özel Bir Çocuk Sağlığı ve Hastalıkları Kliniğine Başvuran 2 – 5 Yaş Grubu Çocukların Beslenme Durumunu Etkileyen Faktörler”** isimli araştırma projesine ait Klinik Araştırmalar Etik Kurulu (KAEK) Başvuru Dosyası **(1797)** kayıt Numaralı KAEK Başvuru Dosyası, Yeditepe Üniversitesi Klinik Araştırmalar Etik Kurulu tarafından **29.01.2020** tarihli toplantıda incelenmiştir.

Kurul tarafından yapılan inceleme sonucu, yukarıdaki isimi belirtilen çalışmanın yapılmasının etik ve bilimsel açıdan uygun olduğuna karar verilmiştir (**KAEK Karar No: 1156**).

Prof. Dr. Turgay ÇELİK
Yeditepe Üniversitesi
Klinik Araştırmalar Etik Kurulu Başkanı

7.2. Institutional Approval

08/01/ 2020

Konu Klinik araştırma için
veri kullanım izni hk.

Yeditepe Üniversitesi Klinik Araştırmalar Etik Kurul Başkanlığına

Sağlıklı Nesiller Çocuk Sağlığı ve Hastalıkları Kliniği'nde akademik amaçlı olarak yapılması planlanan 'İzmir'de Özel bir Çocuk Sağlığı ve Hastalıkları Kliniği'ne Başvuran 2-5 Yaş Grubu Çocukların Beslenme Durumunu Etkileyen Faktörler' isimli klinik araştırmanın gerçekleştirilmesinde kullanılmak üzere, Sağlıklı Nesiller Çocuk Sağlığı ve Hastalıkları Kliniği'ne ait hasta verilerinin sorumlu araştırmacı; Diyetisyen Rakel Rital Alaluf tarafından kullanılması uygundur.

Gereğini bilgilerinize sunarım.

Prof. Dr. Hasan Özkan

Prof. Dr. Hasan ÖZKAN
Çocuk Sağ. ve Hast. Uzmanı
Dip. Yasa No. 33159

7.3. Informed Consent



T.C. YEDİTEPE ÜNİVERSİTESİ
KLİNİK ARAŞTIRMALAR ETİK KURULU
BİLGİLENDİRİLMİŞ GÖNÜLLÜ OLUR FORMU

Sayın Katılımcı ve Yasal Ebeveyni,

Ben Diyetisyen Rakel Rital Alaluf. Sağlıklı Nesiller Çocuk Sağlığı ve Hastalıkları Kliniği'nde Diyetisyen olarak yürüttüğüm “İzmir’de Özel bir Çocuk Sağlığı ve Hastalıkları Kliniği’ne Başvuran 2-5 Yaş Grubu Çocukların Beslenme Durumunu Etkileyen Faktörler” isimli yüksek lisans tezimin amacı çocukların beslenme önerilerine uygunluğunu saptamak ve etkili faktörleri değerlendirmektir.

Araştırmaya tahmini 360 kişinin katılımı planlanmaktadır. Sizden beklenen yaklaşık on dakika sürecek olan soruların eksiksiz ve içtenlikle cevaplanmasıdır. Sizden kişisel ve kimlik bilgileriniz alınmayacaktır. Araştırma sırasında alınacak bilgiler gizli tutulacak ve sadece araştırma amaçlı kullanılacaktır.

Araştırmamın amacına ulaşması için sizden istediğim; Besin Tüketim Sıklığı Formu’nda yer alan besinlerin tüketim sıklığını çocuğunuzun tüketimine göre işaretlemek, Veri Toplama Formu ve Ebeveyn Yemek Zamanı Davranışları Ölçeği’ni cevaplandırmak olacaktır.

Sizin yazılı, imzalı onayınıza ek olarak çocuğunuzun da gönüllü olması beklenmektedir. Bu formu okuyup onaylamanız, araştırmaya katılmayı kabul ettiğiniz anlamına gelecektir. Çalışmaya katılmama veya katıldıktan sonra herhangi bir anda çalışmayı bırakma hakkına da sahipsiniz.

Eğer verilen bilgiler dışında daha fazla bilgiye ihtiyaç duyarsanız bana şimdi sorabilir ya da konuyla ilgili görüşlerinizi paylaşmak için aşağıdaki iletişim bilgilerimden bana ulaşabilirsiniz.

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

ayrılabilceğimi biliyorum.

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

Tarih:

Ad-Soyad:

İmza:

Sorumlu Araştırmacı: Dr. Öğr. Üyesi Binnur OKAN BAKIR

02165780657

e-mail: binnur.bakir@yeditepe.edu.tr

7.4. Food Frequency Questionnaire

BESİN TÜKETİM SIKLIĞI FORMU							
Besinler	Tüketim Sıklığı (kez)						Miktar (İstedığınız bir şekilde belirtiniz)
	Hergün	Haftada 5-6	Haftada 3-4	Haftada 1-2	15 günde bir	Ayda bir	
Süt							
Yoğurt							
Peynir							
Kırmızı et							
Tavuk eti							
Balık eti							
Yumurta							
Kurubaklagiller							
Yağlı tohumlar (ceviz, badem vb.)							
Sebze							
Meyve							
Ekmek (beyaz / tam tahıllı seçiniz)							
Tahıllar (Bulgur, pirinç, makarna vb.)							
Sıvı yağ							
Katı Yağ							
Şeker ve şekerli yiyecekler							
Su							
Diğer							

7.5. Data Collection Form

VERİ TOPLAMA FORMU			
Yaş:		Beden ağırlığı(kg):	
Cinsiyet:		Boy Uzunluğu:(cm)	
		BKİ: (Arşatırmacı tarafından hesaplanacak)	
	Beden ağırlığı(kg)	Boy Uzunluğu(cm)	BKİ: (Arşatırmacı tarafından hesaplanacak)
Anne			
Baba			
Kardeş Sayısı:	 tane büyük kardeşi var		
	 tane küçük kardeşi var		
Annenin Doğum Yaptığı Yaş:			
Annenin Eğitim Durumu (seçiniz)	ilkokul / lise / üniversite /lisansüstü mezunu		
Babanın Eğitim Durumu(seçiniz)	ilkokul / lise / üniversite /lisansüstü mezunu		
Bebek kaç ay boyunca <u>sadece</u> (su/formula haricinde) anne sütü aldı?			
Bebek toplam kaç ay boyunca emzirildi?			
Kaçıncı ayda ek gıdaya(yoğurt/meyve püresi/sebze püresi vb.) başlandı?			
Çocuğunuz günde kaç saat TV/tablet/telefon başında? (seçiniz)	1 saatten az 1 saat 1 saatten fazla 2 saatten fazla		
Çocuğunuz ekran başında yemek yiyor mu? Yiyorsa hangi sıklıkta?	Hiçbir zaman / Bazen /Çoğunlukla / Her zaman		
Haftada kaç kez ailecek birlikte akşam yemeği yiyorsunuz? (seçiniz)	Hiçbir zaman / 1-2 / 3-4 / 5-6 / 6-7		

Çocuğunuzun gün içinde bakımı kim tarafından sağlanıyor?

Anne
Baba
Aile büyüğü
Bakıcı
Diğer(belirtiniz):

Çocuğunuzun beslenmesiyle ilgili yararlandığınız kaynakları hangi sıklıkla kullanıyorsunuz?

	Hiçbir zaman	Nadiren	Ara sıra	Sıklıkla	Her zaman
Çocuk Doktoru					
Diyetisyen					
Aile büyükleri/ Akrabalar					
Arkadaşlar/ Yakınlar					
Yazılı kaynaklar					
Instagram					
Twitter					
Facebook					
Televizyon					

Çocuğunuzun beslenmesiyle ilgili bu kaynakları ne kadar yararlı buluyorsunuz?

	Hiç (Uygulanabilir değil)	Nadiren	Ara sıra	Sıklıkla	Her zaman (Çok yararlı buluyorum)
Çocuk Doktoru					
Diyetisyen					
Aile büyükleri/ Akrabalar					
Arkadaşlar/ Yakınlar					
Yazılı kaynaklar					
Instagram					
Twitter					
Facebook					
Televizyon					

7.6. Parent Mealtime Action Scale

Bir hafta boyunca, aşağıdaki yemek zamanı davranışlarını hangi sıklıkta göstermektedirsiniz?

Her eylemden sonra uygun numarayı yuvarlak içine alınız.

Ebeveyn Yemek Zamanı Davranışları		Hiçbir Zaman	Bazen	Her Zaman
1.	Yemek yemeyi çocuğum için bir eğlenceye ya da oyuna dönüştürdüm.	1	2	3
2.	Çocuğuma verdiğim yemeğin aynısını ben de yedim.	1	2	3
3.	Çocuğumla masaya oturdum ama ben yemedim.	1	2	3
4.	Çocuğumun istediğini yemesine izin verdim.	1	2	3
5.	Çocuğuma yemeğine baharat, ketçap, mayonez vb. istediği tatlandırıcıları katmasına izin verdim.	1	2	3
6.	İyi davranışını ödüllendirilmek için, çocuğuma sevdiği bir yiyeceği verdim.	1	2	3
7.	Çocuğuma yemeğini yemesi için ödül olarak sevdiği bir faaliyet ya da oyuncağı teklif ettim.	1	2	3
8.	Çocuğuma yemeğini yemesi için ödül olarak sevdiği bir tatlıyı vermeyi teklif ettim.	1	2	3
9.	Çocuğuma, istemediği bir yemek yerine sevdiği başka bir yemeği yemesine izin verdim.	1	2	3
10.	Çocuğuma, önerdiğim yemek seçeneklerinden istediğini seçmesine izin verdim.	1	2	3
11.	Çocuğuma, ailemizin yediği yemeklerden farklı özel bir yemek hazırladım.	1	2	3
12.	Çocuğumun aşırı yemek yemesini engelledim.	1	2	3
13.	Çocuğuma yemek yemeyi ne kadar çok sevdiğimi söyledim.	1	2	3
14.	Çocuğuma, eğer denerse yiyeceklerin tadının ne kadar güzel olduğunu fark edeceğini söyledim.	1	2	3
15.	Çocuğuma, arkadaşlarının ya da kardeşlerinin bu yemeyi ne kadar çok sevdiklerini söyledim.	1	2	3
16.	Çocuğuma yemeyin onu sağlıklı, akıllı ve güçlü yapacağını söyledim.	1	2	3
17.	Çocuğuma her gün meyve verdim.	1	2	3
18.	Çocuğumun yemeğindeki hayvansal yağları (margarin, kuyruk yağı, kaymak vb.) azalttım.	1	2	3

19.	Her gün meyve yedim.	1	2	3
20.	Her gün sebze yedim.	1	2	3
21.	Her gün gazlı içecek (örn. Kola, fanta, gazoz vs.) içtim.	1	2	3
22.	Her gün tatlı yiyecekler ve şeker yedim.	1	2	3
23.	Her gün tuzlu atıştırmalıklardan (cips vb) yedim.	1	2	3
24.	Kendi yemeğimdeki hayvansal yağları (margarin, kuyruk yağı, kaymak vb.) azalttım.	1	2	3
25.	Çocuğumun bir günde yiyebileceği tatlı yiyecek miktarına sınırladım.	1	2	3
26.	Çocuğumun bir günde içebileceği gazlı içeceklere sınır koydum.	1	2	3
27.	Çocuğumun bir günde yiyebileceği tuzlu atıştırmalıkların miktarına sınırladım.	1	2	3
28.	Çocuğum “aç değilim” dese bile ona yemek yemesi için ısrar ettim.	1	2	3
29.	Çocuğuma uykusu varken ve kendini iyi hissetmezken bile yemek yemesi için ısrar ettim.	1	2	3
30.	Çocuğuma duygusal olarak üzgün olduğu durumlarda da yemek yemesi için ısrar ettim.	1	2	3
31.	Çocuğuma her yemekten biraz verdim.	1	2	3

Ebeveyn Yemek Zamanı Davranışları Ölçeği Alt Boyutlarına Karşılık Gelen Maddeler
Atıştırma Miktarları
25. Çocuğumun bir günde yiyebileceği tatlı yiyecek miktarını sınırladım.
26. Çocuğumun bir günde içebileceği gazlı içeceklerle sınır koydum.
27. Çocuğumun bir günde yiyebileceği tuzlu atıştırmalıkların miktarına sınırladım.
Olumlu İkna
13. Çocuğuma yemek yemeyi ne kadar çok sevdiğimi söyledim.
14. Çocuğuma, eğer denerse yiyeceklerin tadının ne kadar güzel olduğunu fark edeceğini söyledim.
15. Çocuğuma, arkadaşlarının ya da kardeşlerinin bu yemeyi ne kadar çok sevdiklerini söyledim.
16. Çocuğuma yemeyin onu sağlıklı, akıllı ve güçlü yapacağını söyledim.
Günlük Meyve Sebze Seçenekleri
17. Çocuğuma her gün meyve verdim.
19. Her gün meyve yedim.
20. Her gün sebze yedim.
Ödül Kullanımı
1. Yemek yemeyi çocuğum için bir eğlenceye ya da oyuna dönüştürdüm.
6. İyi davranışını ödüllendirilmek için, çocuğuma sevdiği bir yiyeceği verdim.
7. Çocuğuma yemeğini yemesi için ödül olarak sevdiği bir faaliyet ya da oyuncağı teklif ettim.
8. Çocuğuma yemeğini yemesi için ödül olarak sevdiği bir tatlıyı vermeyi teklif ettim.
Yeme Konusunda Israr
28. Çocuğum "aç değilim" dese bile ona yemek yemesi için ısrar ettim.
29. Çocuğuma uykusu varken ve kendini iyi hissetmezken bile yemek yemesi için ısrar ettim.
30. Çocuğuma duygusal olarak üzgün olduğu durumlarda da yemek yemesi için ısrar ettim.
Atıştırma Modeli
21. Her gün gazlı içecek (örn. Kola, fanta, gazoz vs.) içtim.
22. Her gün tatlı yiyecekler ve seker yedim.
23. Her gün tuzlu atıştırmalıklardan (cips vb) yedim.
Özel Yemekler
2. Çocuğuma verdiğim yemeğin aynısını ben de yedim.
3. Çocuğumla masaya oturdum ama ben yemedim.
11. Çocuğuma, ailemizin yediği yemeklerden farklı özel bir yemek hazırladım.
31. Çocuğuma her yemekten biraz verdim.
Havyasal Yağların Azaltılması
12. Çocuğumun aşırı yemek yemesini engelledim.
18. Çocuğumun yemeğindeki hayvansal yağları (margarin, kuyruk yağı, kaymak vb.) azalttım.
24. Kendi yemeğimdeki hayvansal yağları (margarin, kuyruk yağı, kaymak vb.) azalttım.
Birden Fazla Yemek Seçeneği
4. Çocuğumun istediğini yemesine izin verdim.
5. Çocuğuma yemeğine baharat, ketçap, mayonez vb. istediği tatlandırıcıları katmasına izin verdim.
9. Çocuğuma, istemediği bir yemek yerine sevdiği başka bir yemeği yemesine izin verdim.
10. Çocuğuma, önerdiğim yemek seçeneklerinden istediğini seçmesine izin verdim.

PMAS Dimensions and Corresponding Questions:

1. Snack Limits: Consists of questions; 25, 26 and 27. It evaluates the restrictions that parents put on their children on the amount of food, drink and snacks.

2. Positive persuasion: Consists of questions; 13, 14, 15 and 16. It evaluates the verbal persuasions that parents use in order to persuade their children on eating.

3. Daily fruit and vegetable availability: Consists of questions; 17, 19 and 20. It evaluates the behaviors of parents about the amount of fruit and vegetables that consumed by themselves and their children.

4. Use of rewards: Consists of questions; 1, 6, 7 and 8. It evaluates the activities or foods that parents offer in order to persuade their children to eat.

5. Insistence on eating: Consists of questions; 28, 29 and 30. It evaluates the pressure that parents put on their children to eat.

6. Snack modeling: Consists of questions; 21, 22 and 23. It evaluates parent's eating behavior on snack consumption.

7. Special meals: Consists of questions; 2, 3, 11 and 31. It evaluates whether a special meal is prepared for the children different from family members.

8. Fat reduction: Consists of questions; 12, 18 and 24. It evaluates fat consumption behaviors of parents.

9. Many food choices: Consists of questions; 4, 5, 9 and 10. It evaluates parent's behaviors on letting their children to make choices about their food intake.