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Determination of Nutritional Status of Children with Special Needs: A Pilot Study

Ülkü Demirci [1], Penbe Merve Korkmaz [2] , Hayrettin Mutlu [3]

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[1] *Beykent University, School of Health Sciences,Department of Nutrition and Dietetics*
[2] *İstanbul Gedik University, Health Sciences Faculty, Department of Nutrition and Dietetics*
[3] *İstanbul Health and Technology University, Health Sciences Faculty, Department of Nutrition and Dietetics*

Abstract

Psychosocial and abnormal determinants in children and adolescents with special needs can be effective in feeding behavior. In children with special needs, the development of food selection or hypersensitivity observed very often. Studies made with these, children with Down syndrome being obese or overweight prevalence of approximately 33.5% - 43.5% rate, the prevalence of malnutrition in children with cerebral palsy is approximately 22.2% - 78.2% in the rates of children diagnosed with autism spectrum disorder and it has been observed that children are more prone to be obese or overweight when compared to children with normal development. The number of studies in this field in our country is limited due to a variety of factor. Thus eating behaviour of individuals with special needs is not yet fully understood. The aim of our study was to evaluate children with special needs with the Eating Behavior Scale in children. The study sample consisted of 47 boys and 16 girls, ages between 6 and 18, who were clinically and cytogenetically diagnosed with developmental disorders and their legal guardians. The sample covers 6 different diagnostic groups (Down Syndrome, Mental Retardation, Autism Spectrum Disorder, Prader Willi Syndrome, Mentel Syndrome, and Cerebral Palsy). Adaptation and validation of the Childhood Eating Behavior Questionnaire, used in our research, made by Yilmaz R, et al which gives the results of subscale score and total scale score. Our study was carried out at a private Integrated Physical Activity Center. Evaluation of research data is done with Spss 25.

The height, weight, and age average of the research participants were by order (133,33 cm ± 18,9)(40,6kg ± 19,49) and (10,71yrs ± 3,319). Furthermore, the average Body Mass Index was (22,17 ± 7,01) which is not within the recommended BMI values for children. There was no significant difference between the total nutritional behavior scores(P=0,155)) when the Eating Behavior Scale sub-scores according to gender and special needs groups were examined, the boys diagnosed with Cerebral Palsy groups had significantly higher Emotional Undernourishment Subscores and Picky Eating subscores compared to other children. No significant difference was found in girls according to their eating subscore and specific requirement type.

In children with special needs, adequate and balanced nutrition is one of the main factors that increase the quality of life and prevents the development of diseases. Eating behaviors may differ according to diagnosis. Especially in children with Cerebral Palsy, emotional undereating and food selectivity should be taken into consideration during the treatment period. Thus diet plans should be adjusted to provide more energy, balance metabolism, compensate for deficiencies and increase digestion. In addition, partial or total enteral/parenteral nutrition treatments should also be taken under consideration in case of malnutrition, poor/unsafe oral intake or elevated needs, to provide adequate growth and development.

Key Words: special needs, nutritional behavior ın children, obesity, malnutrition

Introduction

Psychosocial and anomaly-related determinants may have an impact on nutritional behavior in children and adolescents with special needs. Food selection or the development of hypersensitivity is also very common in children who cannot develop normally. The most common example of this is seen in children and individuals with autism spectrum disorders. Autism spectrum disorders include a complex set of developmental disorders characterized by disorders in communication, social interaction, and repetitive behavior. In general, as children with special needs are at risk of being low or overweight, it is also important to evaluate their nutritional status. The majority of the participants constituting the sample of this study are children with special needs who have Autism Spectrum Disorder, Cerebral Palsy or Down Syndrome, and studies on these groups show

that the prevalence of children with Down Syndrome being obese or overweight is approximately 33.5%- 43.5% when compared to children with normal development. The prevalence of malnutrition in children with Cerebral Palsy is approximately 22.2% -78.2%, and children with Autism Spectrum Disorder are more likely to be obese or overweight (Nor & Mohamed, 2015). Sensory processing disorders are also extremely common. The prevalence of autism spectrum disorders is increasing, and it is currently estimated to affect one in sixty-eight children (Cermak & Sharon 2010). In general, although it is still very limited in developing countries, the evidences emerging about the nutritional disorders of children with ASD, DS and CP provide guidance in determining the nutritional status and taking further measures in line with its results. For this reason, in the Integrated Physical Activity Center (BUFAM) located in Kartal Region, in the center where children with normal development and special needs receive education together, determining the nutritional status of children with special needs, as well as comparing the eating behaviors of children with normal development and special needs children, and it is aimed to show the need for nutrition education in these individuals with objective data. Since the number of studies in this field in our country is limited due to various factors, it is not known exactly how the nutritional behavior of individuals with special needs affects these individuals physiologically and psychologically in the later stages of their lives. Although there are many scientific data that psychomotor development increases with exercise and physical activity in both normally developing individuals and individuals with special needs, there are not enough studies about the correlation between food consumption and mental and physical development. In line with the results obtained from this definition study, it is aimed that the second step of the pilot study is to determine the changes in anthropometric measurements before and after nutrition training and its results will shed light on many more studies.

The aim of this study is to screen dietary practices among children with special needs and to obtain information about nutritional status. What makes the study unique is the diversity and size of the sample and the education of different diagnostic groups with special needs in the integrated physical activity center. The working groups are boys and girls and their legal guardians, who are clinically aged 5 to 18 years and who have proven cytogenetically not to develop normally.

It was thought that the effects of these variables on food consumption could be observed on the participants determined from children and adolescents with special needs in the Dolayoba Sports Complex. For this purpose, eating behavior questionnaires were applied to the parent and the child separately, and the information about the eating behavior of the child was consulted from the parents who care for the child with special needs. The outputs obtained from the project are intended to guide public institutions / organizations and other researchers related to the subject.

Nutrition, which is an important factor in the growth and development period in children and adolescents with special needs, is necessary for the continuation of health and happiness and also gains importance. Nutritional problems in children and adolescents with special needs affect health negatively, reducing social, physical and physiological well-being and thus quality of life. In

this case, difficulties can be seen in the family life of the child who has a nutritional problem. Basically, physical and social inequalities have an impact on diet and body weight, with studies focusing only on diet and body weight, regardless of whether it is due to the anomaly, the conditions leading to the inequality do not change. Therefore, avoiding dietary and body weight inequalities requires the simultaneous implementation of evidence-based intervention efforts to address these specific risk factors.

It was aimed to determine the risk of malnutrition and obesity and nutritional status of the participants who were applied the eating behavior questionnaire in children and whose anthropometric information was obtained, and to emphasize the importance of nutritional recommendations to increase their quality of life in line with the findings. Among the neurodevelopmental disorders classified under the special needs group, autism, cerebral palsy, Down syndrome and mental retardation are among the most common anomalies in children (Nor & Mohamed 2015). In addition to the underdevelopment of social skills in children with atypical development, eating behavior disorders and related developmental retardation are also common problems. Since these children are at risk of malnutrition (obesity, growth retardation, etc.), it is very important to evaluate their nutritional status. (Samarkandy&Manal 2012). In studies conducted on individuals with special needs, it is observed that individuals or families who are responsible for these individuals have an effect on meeting their nutritional needs. Because these anomalies have been found to cause significant constraints in three or more of the following areas: self-care, comprehension and language skills, learning, mobility, self-orientation, independent living capacity, economic self-sufficiency, and ability to function independently without coordinated services (Ptomey & Lauren 2012). For this reason, within the scope of studies aimed at determining the nutritional status of these individuals, the food consumption frequency questionnaire filled out by children with special needs, adolescents and their parents or legal caregivers who are educated at BUFAM was taken into consideration.

Individuals who do not show normal development in intellectual and physical terms face social and physical difficulties and inadequacies from the early stages of their lives. Although the studies for this population have focused on the area of social inequalities, significant health inequalities have also been identified. Eating disorders and related health problems that may occur with various effects, such as determinants of psychosocial or anomaly, role modeling in the environment where these individuals develop, are ignored. However, it has been observed that unhealthy nutrition causes advanced chronic diseases, oral and dental health problems, growth retardation, obesity and cancer, depending on genetic and environmental characteristics (Ziegler & Jane 2018; Estevez & Groth 2000). Studies on public health have found a positive correlation, particularly between fresh vegetables and fruits, whole grains and poor quality protein, saturated fats, diets rich in sugar and salt, and chronic diseases (Estevez & Groth 2000). Obesity is closely related to type 2 diabetes, cardiovascular diseases, some cancers and early mortality, poor

nutrition and malnutrition (World Health Organization, 2003). However, the literature reveals that some population groups are at greater risk of malnutrition than others. More specifically, evidence suggests that people with low social status, special needs, or special care are more likely to have worse dietary habits than those with higher status, which may contribute to their health inequality. In the 2nd National Food Consumption study conducted in Germany in 2016, this issue was focused on and selected reviews and meta-analyzes on social inequalities in nutrition were presented. In addition, potential causes of social inequalities in nutrition are discussed and solutions are proposed based on the results of the present research. More specifically, in addition to negative psychosocial (e.g. individuals with special needs, low levels of social support) and socio-cultural factors (e.g. negative eating traditions), socio-economic and structural deprivation (e.g. poverty) is associated with malnutrition in people with low social status. (Fekete & Christine 2016). It has been observed that interventions promoting nutritional quality in disadvantaged groups and meeting nutrition and health expenses are associated with public health and national development level, with long-term effects (Fekete & Christine 2016). In addition, another study on autism spectrum disorder and food-choice behavior studied food selectivity to include food refusal, limited food repertoire, and high-frequency single food intake using a modified food frequency questionnaire and a 3-day food record. (Cermak & Sharon 2010). Food selectivity was compared between 53 children with ASD and 58 children, typically 3-11 years old, and food adequacy was assessed against dietary reference entries (Cermak & Sharon 2010). Children with ASD were compared with children with typical development, and it was observed that 41.7% of children with autism refused food, while this rate was 18.9% in children with typical development (Cermak & Sharon 2010). In other words, it has been observed that children with Asd exhibit more food refusal (Cermak & Sharon 2010). It was also observed that ASD children had a more limited food repertoire (19.0 food vs 22.5 food; P <.001). In addition, 4 children with ASD and 1 typical developing child were observed who consumed a single food, and it was confirmed that high-frequency single food intake was seen at a higher rate in these children with special development (Cermak & Sharon 2010). It has been observed that these children with a more limited food range do not have a greater amount of nutrient intake and therefore macro and micronutrient deprivation may occur (Cermak & Sharon 2010). In addition, in another case-controlled cross-sectional study with 122 ASD children to assess their vitamin D status and assess the relationship between vitamin D deficiency and the severity of autism, 50 percent of the participants had vitamin D deficiency and 30% had vitamin D deficiency. It was observed that serum saturation of 25 hydroxy-d was at average levels in individuals with severe autism and significantly lower in individuals with mild / moderate autism (Saad & Khaled 2016). These participants were then given vitamin D3 (300 IU / kg / day at a level not exceeding 5000 IU / day) for 3 months, and collectively, 80.72% (67/83) of the participants who received vitamin D3 treatment reported behavior, eye contact, and attention span and abnormal behavior checklist subscales improved significantly (Saad & Khaled 2016). As a result of this research, it was observed that vitamin D supplementation

may have beneficial effects in breakthroughs with serum vitamin D levels greater than 40 ng / ml (Saad & Khaled 2016). In studies of children with cerebral palsy (CP) in participant groups, growth and nutritional disorders are said to be one of the common secondary health problems for children with CP (Kuperminc & Michelle 2008). Due to health problems such as psychological and physiological problems and motor function disorders, growth retardation and malnutrition can be seen in individuals with CP. Understanding the etiology of malnutrition in this group of special needs shows that various interventions are needed to improve growth. Recognition and understanding of neurological, endocrinological, and environmental factors are grounded in shaping the care of children with CP. (Kuperminc & Michelle 2008) Examination of these factors has been observed to be based on advances in current assessment methods to address the challenges of measuring growth in children with CP. (Kuperminc & Michelle 2008).

Today, studies conducted with children and individuals with special needs generally cover a single specific anomaly, malnutrition screening deficiency of a single macro or micronutrient group or only obesity, and the sample size of these groups is insufficient in definition studies (Kuperminc & Michelle 2008). After the screening of eating behavior disorder in individuals with special needs is completed, the data should undertake the mission of forming the basis of intervention studies and opening the door to future preventive studies (Fekete & Christine 2016).

However, the scarcity of integrated physical activity centers in our country cannot provide a basis for such definition, screening and application studies. Descriptive growth charts and body composition norms provide information that can help healthcare professionals interpret growth and improve growth and nutrition in children with special needs. To link growth to health measures and optimize health and well-being, the results of large-scale studies such as this study will be necessary to develop and standardize growth standards for children with atypical development, and to compare these particular groups and create specific nutritional intervention patterns. Difficulties experienced by individuals with special needs in meeting their nutritional needs may also cause nutritional diseases such as malnutrition, dental problems, and growth retardation (Ziegler & Jane 2018).

Method

The study sample consisted of 47 boys and 16 girls aged 6 to 18 years, and their legal guardians, who were clinically and cytogenetically proven not to show normal development. The sample includes 6 different diagnosis groups. Down Syndrome (DS, n = 15), Mental Retardation (MR, n = 5), Autism Spectrum Disorder (ASD, n = 31), Prader Willi Syndrome (PWS, n = 1), Mentel Syndrome (MS, n = 1) and Cerebral Palsy CP). The Turkish adaptation of the childhood eating behavior questionnaire used in our study and its validity-reliable study Yilmaz R, et al. It is a Likert-type scale with 35 items and evaluated on 5 points (1 = never, 5 = always) answered by parents. Our

study was implemented in the Integrated Physical Activity Center. Research data were evaluated with the Spss 25 package program. The obtained continuous variables (quantitative variables) will be expressed with mean ($\bar{x}$), standard deviation (ss) values and in the comparison of groups, the Significance Test of the Difference Between Two Means (independent groups t test) for parameters showing normal distribution, Mann-Whitney for parameters not showing normal distribution The one-way anowa test was used to compare the scale scores of the U and more than two groups. Categorical variables will be expressed as number (S) and percentage (%) and will be evaluated by Pearson Chi-square test and Fisher Exact test. The significance level is $p < 0.05$.

Results

Our study was conducted on 63 children with special needs. The average height, weight and age of the participants in the study were (133.33 cm ± 18.9) (40.6 kg ± 19.49) and (10.71 years ± 3.319), respectively. Also, the mean body mass index was (22.17 ± 7.01), which was not within the recommended BMI values for children. The eating volume scale scores of children with special needs are presented in Table 1e.

Table 1: Eating attitude scale and subscale scores in children with special needs.

	Number	**Scale and Sub Scores**	**SS**	**Minimum**	**Maximum**
Eager to Eat	63	12,70	2,65	7	18
Emotional Overeating	63	9,83	3,11	4	18
Enjoying Food	63	12,76	4,43	5	24
Eager to drink	63	6,41	1,99	3	11
Eager to satiety	63	16,16	4,47	8	30
Slow Eating	63	8,94	2,63	4	16
Emotional Less Eating	63	10,11	2,91	3	16
Food Selectivity	63	8,27	0,34	3	15
Total Score	63	85,17	17,08	41	114

Tablo 2: Comparison of eating attitude scale scores according to diagnosis

DIAGNOSIS	**CP(5)**	**DS(15)**	**MR(5)**	**ASD(36)**	**PWS(1)**	**MS(1)**	**P**
Sub Points	Mean/SS	Mean/SS	Mean/SS	Mean/SS	Mean/SS	Mean/SS	
Eager to Eat	11,6±0,7	13,6±0,6	12,8±2,2	12,4±0,4	12,0±0	14,0±0	**0,680**
Emotional Overeating	11,0±1,7	11,20±0,7	9,8±1,7	8,92±0,5	15,0±0	11,0±0	**0,081**
Enjoying Food	15,2±2,7	14,33±1,1	10,0±2,2	11,83±0,6	19,0±0	18,0±0	**0,059**
Eager to drink	6,40±0,6	7,07±0,5	5,2±0,8	6,31±0,3	7,0±0	6,0±0	**0,611**
Eager to satiety	17,4±2,7	17,67±1,3	17,2±2,3	15,2±0,6	16,0±0	16,0±0	**0,573**
Slow Eating	10,8±1,4	9,13±0,7	8,00±1,5	8,69±0,4	11,0±0	8,0±0	**0,525**
Emotional Less Eating	11,6±1,8	11,8±0,5	8,40±0,9	9,33±0,4	12,0±0	12,00±0	**0,035***
Food Selectivity	10,0±1,4	9,6±0,7	7,2±1,4	7,47±0,4	11,0±0	10,00 ±0	**0,038***
Total Scale Score	94±21,4	94,47±13,1	78,6±22,5	80,22±15,7	103,00±0	95,00±0	**0,943**

Discussion

The average BMI value of the participants was found to be 22.17, this ratio is not within the recommended bki values for children (Karaağoğlu & Şanlıer 2019). According to the type of special needs, bki value was found to be lower in children with CP compared to children with down syndrome, and similar rates were reported in Dahlseng et al. (Dahlseng & Magnus 2012). No significant difference was found between genders between total nutritional behavior scores (P = 0.155)). While there was no significant difference between the total scores according to the diagnosis (P> 0.05), when the scale sub-scores were examined for the gender and special needs groups, emotional low eating and food selectivity sub-scores of boys with CP were found to be significantly higher than others (P <0.0). No significant difference was found in girls in terms of

eating sub-score and type of special needs. Similar results are reported in the study of Pesce et al. (Pesce & Wodarski 1989).

Conclusion

Nutrition in children with special needs increases the quality of life and is a factor to prevent the development of other diseases. Eating behavior varies according to the diagnosis. In particular, emotional low eating and food selectivity of children with sp should be considered during the treatment.

When eating behavior scale subscales were examined according to gender and special need groups, there was no significant difference between total feeding behavior scores ($p = 0.155$). Children diagnosed with cerebral palsy were found to have lower malnutrition scores and food selectivity scores than other children.

In this study, the eating behavior questionnaire also takes into account the differences between special groups, and these data aim to contribute to the literature on anomaly-specific eating behavior trends.

Limitations

Since our research was conducted on children with special needs, families having difficulty in sparing time for face-to-face questionnaires prevented the increase in our sample size. The eating attitudes of children with special needs should be examined in more detail with large-scale studies in larger samples.

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