Original Article

Characteristics of Children between 6-60 Months Old, Attending a Family Health Center in Turkey

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Abstract

Aim: This study was contacted to analyze the percentages of 6-60 months old children who applied to Family Health Centers in Diyarbakır, Turkey.
Methods: The study was conducted with 768 children aged 6-60 months who were recorded in the household identification card in the Family Health Centers. The used data collection form consisted of the questions about the demographic characteristics of the child and the family, and the height and weight information of the child. The percentage distribution, mean, standard deviation, and the differences between the socio-demographic characteristics of the parents and the percentages of the children were analyzed by the chi-square analysis method to determine the information related with the socio-demographic characteristics of the parents. $p < 0.05$ was considered as significant.
Results: The mean age of the children was 23.82±14.98 months, 52.3% of them had normal weight, 14.1% of them were malnourished, and 11.2% of them were obese. When we analyzed the distribution of percentages according to socio-demographic characteristics of the children, there was no statistically significant difference between the children who had different percentages according to the education level of father, the age of mother, the profession of parents and family income ($p>0.05$) while there were statistically significant differences according to the children's percentages and the education level of mothers ($p=0.034$). This study shows that approximately one quarter of the children in Diyarbakır are overweight/obese. It was found that there was a statistically significant difference according to the percentages of children and the educational statuses of their mothers. While the children of the mothers with high educational levels have more obesity, the children of mothers wih low education levels have more malnutrition.

Keywords: Percentage; obesity; malnutrition

Background

Growth and development is a process which consists of the formation of tissues, the growth of the body, increase in muscle strength and control, socializing, thinking, language development and the formation of the personality. The most important characteristic that distinguishes children from adults is their continued growth and development (MEB, 2016).

Childhood is a very long period. Monitoring and evaluating children during this period is important in order to understand if their development is within normal limits or not. This can be done by comparing their particular characteristics with data obtained from the normal children at the same age. The most valuable tool in monitoring their growth is "growth curves". Using these, measurements that are made at specific intervals provide a basis for the monitoring growth. In regularly and properly monitored growing children, deviations can be determined at an early stage, and thus the early diagnosis and treatment of the problems which cause these deviations becomes possible. Furthermore, appropriate preventive health services can be provided for children who are regularly monitored according to their age (Yigit, 2009).

The age- and sex-specific body mass index (BMI) values must be known in order to define malnutrition and obesity in children. According to these evaluation criteria, a BMI-percentage value <5 means malnutrition (protein energy malnutrition=PEM), a BMI-percentage value between 5 and 15 means means being underweight, a BMI-percentage value between 15 and 85 means normal weight, a BMI-percentage value between 85 and 95 means being overweight, and a BMI-percentage value >95 means obesity (Neyzi, et al., 2008). Studies have shown that children with impaired growth during their infancy also have lower weights and are shorter than their peers at school. In addition, their cognitive abilities are affected (Emond, Blair, Emmet, & Drewett, 2007; Kar, Rao, & Chandramouli, 2008).

In 2014, there were reported to be 41 million overweight or obese children under the age of 5 in the world (WHO, 2016a). In a study conducted by the Turkish Ministry of Health in 2010, the prevalence of being overweight in children aged 0-5 years was determined to be 17.9%, the prevalence of obesity was determined to be 8.5%, the prevalence of being very underweight was determined to be 5.6%, and the prevalence of being underweight was determined to be 10.3% (TBSA, 2010).

Four hundred households and mothers of children under three, representing the 23 Health Regions of Botswana, participated in the study. The results show that the levels of wasting, stunting, and being underweight in children under three years of age were 5.5 %, 38.7 % and 15.6 % respectively. Malnutrition was significantly ($p < 0.01$) higher among boys than among girls. Being underweight was less prevalent among children whose parents worked in the agricultural sector than among children whose parents were employed in informal businesses. Children brought up by single parents suffered from being underweight to a significantly ($p < 0.01$) higher level than children living with both parents. The prevalence of being underweight decreased significantly ($p < 0.01$) as family income increased. The higher the level of the mother's education, the lower the level of being underweight observed in children (Nnyepi, Bandeke, & Mahgoub, 2006).

In 2016, the obesity rate in children was highest in Polynesia and Micronesia, at 25.4% in girls and 22.4% in boys, followed by high-income Anglophonic regions, which include the USA, Canada, Australia, New Zealand, Ireland and the United Kingdom. The areas of the world with the largest increase in the number of obese children and adolescents were East Asia, the high-income English-speaking regions, and the Middle East and North Africa. Nauru was the country with the highest prevalence of obesity for girls (33.4%), and the Cook Islands had the highest for boys (33.3%). In Europe, girls in Malta and boys in Greece had the highest obesity rates, comprising 11.3% and 16.7% of the population respectively. Children in Moldova had the lowest obesity rates, comprising 3.2% and 5% of the population respectively. Girls in the UK had the 73rd highest obesity rate in the world (6th in Europe); boys had the 84th highest obesity rate in the world (18th in Europe). Among high-income countries, the United States of America had the highest obesity rates for girls and boys. Girls in the USA had the 15th highest obesity rate in the world; boys had the 12th highest obesity rate in the world. India had the highest prevalence of those who were moderately and severely underweight throughout these four decades (24.4% of girls and 39.3% of boys were moderately or severely underweight in 1975, and 22.7% and 30.7% in 2016). 97 million of the world's moderately or severely underweight children and adolescents lived in India in 2016. By 2022, the world will have more obese children and adolescents than those who are underweight (World Health Organization, 2017).

This study was carried out to analyze the BMI percentages of children between the ages of 6 and 60 months who attended Family Health Centers (FHCs) in Diyarbakır, Turkey.

Methods

The Location and Time of the Study: The study was conducted in 23 FHCs in four regions in the Diyarbakir Provincial Center. The FHCs were selected by lot for each region between February 2015 and July 2015. The study was conducted with 768 children aged 6-60 months who were recorded on the FHC household identification card. In total, 65 FHCs in the city center of Diyarbakir were included in the study. 14 of them were subsidiaries of Yenisehir Community Health Center (CHC), 16 of them were subsidiaries of Kayapınar CHC, 22 of them were subsidiaries of Baglar CHC, and 13 of them were subsidiaries of Sur CHC. 5 of them are subsidiaries of Yenisehir CHC, 5 of them are

subsidiaries of Kayapınar CHC, 11 of them are subsidiaries of Baglar CHC and 2 of them are subsidiaries of Sur CHC. These FHCs were chosen because of the high suitability of their socio-economic status in representing the universe and their easy accessibility.

Diyarbakir is located in the middle part of the Southeastern Anatolia region and is surrounded by foothills of the Southeast Taurus Mountains. Diyarbakır had a surface area of 1,516200 km² and a population of 1,673119 as of 2016. The city's economy is based on oil, tourism, agriculture and husbandry. Oil is an important underground resource for Diyarbakir. The city, which has been a walled settlement since ancient times, is located at the junction of historical trade routes coming from Anatolia, Iran and Mesopotamia in the upper Tigris river basin.

The Universe and Sample of the Study: The study's universe consisted of 768 children aged 6-60 months who attended the FHCs between February 2015 and July 2015 and the mothers of these children who were willing to cooperate and to give the necessary information. The study was conducted with 768 children and mothers who attended the FHCs for any reason between the specified dates and who agreed to participate in the study without sampling.

Data Collection: A data collection form consisting of 15 questions was used in the study. The data collection form consisted of questions about the demographic characteristics of the child and the family, and the height and weight of the child. First, the height and weight of the children aged between 6 to 60 months who had come to the ASM were measured. Then the mothers were asked questions about themselves and their children.

Data Analysis: The coding and the statistical analyses of the data were performed using the SPSS 16.0 (Statistical Package for Social Sciences, SPSS Inc., Chicago, IL, USA) software. The percentage distribution, mean, standard deviation and the differences between the socio-demographic characteristics of parents and the BMI percentages of the children were analyzed by the Chi-square analysis method; $p<0.05$ was accepted as statistically significant.

BMI is a growth and development criterion used in Turkey. BMI is based on weight and height and was calculated using the weight (kg)/height (m^2) formula. The children's heights, weights and the percentage values these represented were evaluated by Turkish national standards which were established by Neyzi et al. (2008). The age and sex of the children were taken into consideration to determine the percentage values, and the analysis was made according to these (Neyzi, et al., 2008).

Evaluation of BMI Percentage Values (Neyzi, et al., 2008).

<5 Very underweight

≥5-<15 Underweight

≥15-<85 Normal

≥85-<95 Overweight

≥95 Obese

Ethical Statement

Legal permission was obtained from the relevant institution. The aim of the study was explained to the mothers, their questions were answered and their verbal approvals were obtained. It was explained to the mothers that the information they gave about their children would be kept confidential, that this information would not be used elsewhere, and that they had the right to leave the study if they chose to. Since the use of humans in the study required the protection of individual rights, the related ethical principles, the "Informed Consent Principle", the "Volunteering Principle" and the "Protecting the Privacy Principle" were fulfilled.

Results

In this study, the mean number of births of the mothers of children aged 6-60 months was 2.68±1.47, the mean birth weight of the children was 3181±567.63 gr, and the mean age of the children was 23.82±14.98 months. It was found that 50.1% of the children were male, and that 49.5% of them had begun to eat nutritional supplements after the first six months of their lives. Table 1 shows the distribution of socio-demographic characteristics of the children aged 6-60 months and their mothers and fathers. The mean age of their mothers was 29.14±5.43 years, 29.4% of them were illiterate and 94.9% of them were housewives. 32.9% of their fathers had graduated from primary school, 82.0% of them were self-employed (shop owner, driver, apprentice, hairdresser, construction worker, fruit seller, fishermen, etc.), and 74.5% of them stated their income to be a middle income.

Table 1. **Socio-Demographic Characteristics of Mothers and Fathers of 6-60 Months Children**

Average Age of Mothers : *29.14 ±5.43*	**N**	**%**
Education of the mothers		
Illiterate	226	29.4
Literate	189	24.6
Primary school graduate	180	23.4
High school	132	17.2
Universty	41	5.4
Education of the fathers		
Illiterate	48	6.3
Literate	149	19.4
Primary school graduate	253	32.9
High school	226	29.4
Universty	92	12.0
Mother's job		
Housewife	729	94.9
Government employee	39	5.1
Father's job		
Government employee	116	15.1
Self-employer	630	82.0
Not working	22	2.9
İncome Status of Family		
Good	62	8.1
Middle	572	74.5
Bad	134	17.4
Age Group of Mothers		
17-27 age	318	41.4
28-38 age	405	52.7
39-49 age	45	5.9
Total	768	100.0

Table 2. The distribution of children aged 6-60 months according to percentages

Percentages	N	%
Very underweight	108	14.1
Underweight	78	10.2
Normal	402	52.3
Overweight	94	12.2
Obese	86	11.2
Total	768	100.0

Table 3. The distribution of percentages of the children aged 6-60 months according to their socio-demographic characteristics

	Very underweight		Underweight		Normal		Overweight		Obese		X^2:p	
Gender of the children	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	X^2	**P**
Girl	65	17.0	39	10.2	194	50.7	42	11.0	43	11.2	6.028	0.197*
Men	43	11.2	39	10.1	208	54.0	52	13.5	43	11.2		
Education of the mothers												
Illiterate	42	18.6	23	10.2	126	55.8	15	6.6	20	8.8	**27.728**	**0.034***
Literate	29	15.3	20	10.6	87	46.0	29	15.3	24	12.2		
Primary school graduate	15	8.3	23	12.8	96	53.3	28	15.6	18	10.0		
High school	16	12.1	7	5.3	72	54.5	19	14.4	18	13.6		
Universty	6	14.6	5	12.2	21	51.2	3	7.3	6	14.6		
Education of the fathers												
Illiterate	6	12.5	7	14.6	25	52.1	4	8.3	6	12.5	10.789	0.822*
Literate	27	18.1	16	10.7	77	51.7	17	11.4	12	8.1		
Primary school graduate	35	13.8	28	11.1	133	52.6	29	11.5	28	11.1		
High school	28	12.4	22	9.7	121	53.5	28	12.4	27	11.9		
Universty	12	12.9	5	5.4	46	50.0	16	17.4	13	14.1		
Age Group of Mothers												
17-27 Age	40	12.6	27	8.5	169	53.1	45	14.2	37	11.6	13.207	0.105*
28-38 Age	56	13.8	49	12.1	208	51.4	47	11.6	45	11.1		
39-49 Age	12	26.7	2	4.4	25	55.6	2	4.4	4	8.9		
Mother's job											3.005	0.557*
Housewife	102	14.0	73	10.0	384	52.7	91	12.5	79	10.8		
Government employee	6	15.4	5	12.8	18	46.2	3	7.7	7	17.9		
Father's job											11.483	0.176*
Government employee	17	14.7	11	9.5	59	50.9	13	11.2	16	13.8		
Self-employer	83	13.2	66	10.5	335	53.2	79	12.5	67	10.6		
Not working	8	36.4	1	4.5	8	36.4	2	9.1	3	13.6		
İncome Status of Family												
Good	6	9.7	5	8.1	35	56.5	5	8.1	11	17.7	14.009	0.082*
Middle	77	11.0	63	11.0	296	51.7	68	11.9	68	11.9		
Bad	25	18.7	10	7.5	71	53.0	21	15.7	7	5.2		

* Pearson Chi-square analysis is used.

In Table 2, the distribution of children aged 6-60 months according to their BMI percentages is shown. When these distributions were analyzed, it was found that 52.3% of the children had normal percentages, 14.1% of them were malnourished and 11.2% of them were obese.

When the distribution of percentages of the children aged 6-60 months were analyzed according to their socio-demographic characteristics, there was no statistically significant differences between the children's percentages and genders, the education levels of the fathers, the ages of the mothers, the occupation of the father/mother and family income ($p>0.05$). There was a statistically significant difference between the children's percentages and the educational status of the mothers ($p=0.034$/ Table 3). While the prevalence of obesity was higher in the children of the mothers with high educational levels, the prevalence of malnutrition was higher in the children of the mothers with low educational levels. Breastfeeding made no significant difference between the children and the percentiles ($p>0.05$).

Dıscussion

Growth and development are the most important processes in human life. The period between the age of 0-6 years in particular is a period of rapid growth and development, and this period is vulnerable to the negative effects of environmental conditions. In the period from infancy to the end of adolescence, the feeding of the infant, infectious diseases, hygiene and many other conditions affect the speed and progress of growth (Saritekin, & Dindar, 2013).

In Turkey, various studies about physical growth and development have been and are still being conducted. According to the results of the Monitoring of Growth in School Age Children (6-10 Age Group) (TOÇBI) project which was conducted by the Ministry of Health in Turkey, 1.3% of the children were determined to be very underweight, 7.9% were determined to be underweight, 14.3% were determined to be overweight and 6.5% were determined to be obese. The highest percentage of underweight children was found in Southeastern Anatolia (10.3%) (TOÇBI, 2011). According to the results of the Turkish Nutrition and Health Survey (TBSA) which was conducted on children aged 0-5 years, 5.6% of the children were very underweight, 10.3% of them were underweight, 17.9% of them were overweight and 8.5% were obese (TBSA, 2010). In a study conducted in Istanbul,Turkey, it was found that 47.3% of the children in a hospital were malnourished, 32.0% had mild malnutrition, 9.2% had reasonable malnutrition, 6.1% had severe malnutrition. 52.7% were at a normal weight and all the patients with severe malnutrition were under the age of 1 year old (Güleç, Urgancı, Polat Yagar, & Hatipoglu, 2011). In the study of Arıkan and Bekar, it was found that 9.7% of the children were very underweight, 12.7% of them were underweight, 58.8% of them were at a normal weight, 8.5% of them were overweight and 10.3% of them were obese (Arikan, & Bekar, 2017).

According to the findings of a study which was conducted in Spain, 2.4% of the children between aged 2-5 years were underweight, 46.9% of them were at a normal weight, 21.6% of them were overweight and 28.9% of them were obese (Gauthier, &Gance-Cleveland, 2016). In Peru, 21.1% of the children aged 6-9 years were overweight and 9.4% of them were obese (Pajuelo-Ramirez, Sanchez-Abanto, Alvarez-Dongo, Tarqui-Mamani, & Agüero-Zamora, 2013).

Even if it differs from region to region, as seen in these studies, being overweight is an important problem. It is inevitable that this condition will lead to obesity if the necessary measures are not taken. Being underweight, on the other hand, is a condition that needs to be considered in terms of malnutrition. In our study, it was found that approximately one-quarter of the children were overweight/obese, and 14.1% were malnourished.

Malnutrition is the leading cause of mortality and morbidity in children under the age of five. In addition to congenital defects, malformations, chronic infections and being unconsciousness, the level of welfare, the residential district and the family size and educational levels of mother and father are accepted as risk factors for malnutrition (İnanç, et al., 2005). The prevalence of being underweight in children aged <5 was 25.0% in 1990, but it dropped to 14.3% in 2014 worldwide. Although this decrease was a welcome development, 162 million children under the age of five are malnourished in the world (WHO,2016b).

In our study, although the prevalence of malnutrition was found to be higher in females, while the prevalence of being overweight was found to be higher in in males, the prevalence of obesity was equal in males and females and there was no statistically significant difference. Similarly, the prevalence of being overweight in male children was found to be (non-significantly) high in Gozu's study, which was conducted in primary schools in Mardin, Turkey (Gozu, 2007). In the study of Celik et al., no significant difference was found between the groups in terms of gender (Celik, Sahin, Beyazova, & Can, 2014). In the study of Onal et al. on preschool children, girls were found to be more underweight and boys were found to be more overweight and obese (Onal, et al.,, 2016). Akca et al. conducted a study in Çorum, Turkey in which they reported that male children were more obese than female children (Akca, Uysal, & Büyükgönenç, 2016). A study conducted in children aged 0-5 years in Ankara, Turkey, controversially found that the prevalence of obesity was higher in female children than in male children (Akgun, Bakar, Kut, & Kinik, 2006). In the study of Vancelik et al., it was found that in Erzurum, Turkey the prevalence of being overweight was higher in male children, while the prevalence of obesity was higher in female children (Vancelik et al., 2013). In a study conducted in Brazil, there was no significant difference between the children in terms of weight and gender (Shoeps et al., 2011). In a study conducted in Hong Kong, 49.0% of the children who had growth retardation were male (Hon & Nelson, 2006). According to these results, living in different regions and being exposed to different environmental conditions may have an influence on malnutrition and obesity in terms of gender.

The prevalence of obesity in children is affected by the socio-economic levels of their parents. In developed countries, obesity is more prevalent in families with a low socio-economic status. In developing countries, obesity is more prevalent in the families with a high economic status (Alikasifoglu, & Yordam, 2000). According to the Turkish Demographic and Health Survey (TNSA, 2013), it was found that the percentage of overweight/obese children in the households with a low income was 8.5% while the percentage of overweight/obese children in the households with a high income was up to 16.0%. In general, malnutrition is a problem for those members of the population with a low socio-economic status while being overweight/obese is a problem for those with a high socio-economic status in Turkey (TNSA, 2013). In our study, no statistically significant difference was found between the children's BMI percentages and the income status of their families.

Studies have shown that the educational level of the mothers has an impact on their children's nutrition and weight (Akgun, Bakar, Kut, & Kinik, 2006; TNSA, 2013;Ozmert, 2005; Geçgil, Aslan, İster, Simsek, & Sahin, 2017). Children with more educated mothers tend to be overweight/obese. While the percentage of those who were overweight/obese was determined to be 8.0% in the children with mothers who had not graduated from primary school, this percentage was determined to be 13.0% in the children whose mothers had a high school education or more (TNSA, 2013). In a study conducted in Pakistan to determine the effect of the educational level of mothers on the nutrition of children aged 0-59 months, the percentage of children at a normal weight was 83.3% for the children of literate mothers and 16.7% for the children of illiterate mothers (Shafqat, Manzour, & Abbasi, 2013). In our study, a statistically significant difference was found between the children's BMI percentages and the educational levels of their mothers which parallels these studies. While the percentage of obese children was higher in the children of mothers with a high educational level, the percentage of malnourished children was higher in the children of mothers with low educational level.

In our study, 49.5% of the children were found to have begun to eat complementary foods after the first six months of their lives. The ideal diet for infants is breastfeeding for the first six months, after which the appropriate complementary foods can be used as supplements, but breastfeeding should be continued until the child is two years old. Breastfeeding rates in Turkey are not at the desired level and one of the most important problems related to breastfeeding is the early introduction of complementary foods (Celik, Sahin, Beyazova, & Can, 2014). According to the data from the TNSA 2013, children have been breastfed for quite a long time in recent years, but the use of complementary foods has started at very early ages. In this study, 96.0% of the children were started on breast milk, but 58.0% of infants were fed with breast milk only until the 2nd month, 35.0% of them were fed

with breast milk only until the 3rd month, 10.0% of them were fed with breast milk only until the 5th month. Bolat et al. found that 52.8% of infants were breastfed only until they were 6 months old, and 47.2% of them then began to use complementary foods (Bolat et al., 2011). According to the data from the TBSA, the percentage of the infants who were fed with breast milk for only 4-6 months is 62.5% in Turkey (TBSA, 2010).

Breast milk is the best nutrition for babies and the prevalence of infectious diseases such as diarrhea and pneumonia was lower in breastfed infants. The benefits of breastfeeding continue throughout life. The prevalence of diseases such as obesity, allergic diseases, diabetes mellitus, dental caries, ulcerative colitis and leukemia are lower in older individuals who were fed with breast milk in their infancy (Gun et al., 2009).

Conclusıon and Recommendations

This study shows that approximately one-quarter of the children between 6 and 60 months old are overweight/obese in Diyarbakır. This result indicates a serious health problem, because obese children may become obese obese adults in the future. Similarly, malnutrition is a serious problem. Early diagnosis and treatment of malnutrition is especially important. It is thus of great importance to monitor growth periodically. In the study, the relationship between the BMI percentages of children and the educational status of the mothers was determined. The prevalence of obesity is higher in the children of mothers with high educational levels while the level of malnutrition is higher in the children of mothers with low educational levels. For this reason, both nurses working in public health and school nurses working in educational settings should closely monitor the growth and development of children as a part of their routine activities, and mothers, children and teachers' awareness of child nutrition should be increased. At the same time, it is important to encourage mothers to practice nursing and regular breastfeeding, and to teach them about transition to complementary foods and how to choose food for their children.

By having their obesity recognized in early childhood and the necessary precautions being taken, children will be able to live their lives as more healthy individuals when they become adults. Reducing childhood obesity should be identified as a primary goal of national health care. The planning, implementation and assessment of appropriate interventions for the early detection and prevention of weight gain in children is of utmost importance for healthy individuals and communities. In further studies, training by public health nurses about breast milk and balanced nutrition for families should be planned. All the obese and overweight children identified as the result of this study were directed to pediatric endocrinology polyclinics.

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