Ankara Med J, 2017;(2): 93-101
DOI: 10.17098/amj.286159

Evaluation of Pre-School Health Screening: An Example from Artvin Province

Okul Öncesi Sağlık Taramalarının Değerlendirilmesi: Artvin İli Örneği

Vasfiye Güven[1], Mustafa Kürşat Şahin[2]

[1]Artvin Public Health Directorate, Central Community Health Center
[2]Samsun Ondokuz Mayıs University, Department of Family Medicine

Abstract
Objectives: The purpose of this study was to assess the health status of children at five nursery schools within the Artvin Central Community Health Center region, Turkey, using a school health screening program.
Materials and Methods: 257 children aged 36-72 months were included in this study. Age, sex and height-weight measurement and examinations (hair-hairy skin, eye, ear, oral-dental, genital) were performed with parental permission. The World Health Organization body mass index (BMI) for age was employed. Numbers, percentages, means are given together with standard error and confidence interval. Data were analyzed on SPSS 22.0 software using the chi-square and independent samples t tests.
Results: 257 children aged 36-72 months, 47.50% female, with a mean age of 56.88±1.04 months were enrolled. Mean height was 107.48±0.74 cm, mean weight 18.67±0.35 kg and mean BMI 16.11±0.20 kg/m^2. Normal weight was determined in 82.90% of children, while 13.20% were overweight and 3.50% were obese. Ocular problems were determined in 12.80% of children, hearing problems in 7.00%, dental problems in 14.80%, lice in 4.70% and short frenulum in 1.90%. An urogenital problem was determined in 10.40% of males, and undescended testis in 2.98%.
Conclusion: The most common pathologies in this study were dental and ocular problems. Pre-school health screening allows primary physicians to identify major problems that will impact on school and societal health beforehand and to take appropriate measures.
Key words: Child health, childhood obesity, overweight, refractive error, oral and dental health

Öz
Amaç: Bu çalışma Artvin Merkez Toplum Sağlığı Merkezi bölgesinde bulunan beş anaokulundaki çocukların okul sağlığı tarama programı ile sağlık durumlarının değerlendirilmesi amacıyla yapılmıştır.
Materyal ve Metot: Çalışmaya 36-72 ay yaş grubunda 257 çocuk dahil edilmiş olup, ebeveynlerinden izin alınarak yaş, cinsiyet, boy-kilo ölçümü ve muayeneleri (saç-saçlı deri, göz, kulak, ağız-diş, genital) yapılmıştır. Dünya Sağlık Örgütünün yaşa göre vücut kitle indeksi kullanılmıştır. Veriler SPSS 22.0 programında değerlendirilmiş; sayılar, yüzdeler, ortalamalar standart hata ve güven aralığı ile birlikte verilmiştir. İstatistiksel analizlerde ki-kare testi ve bağımsız örnekler t testi kullanılmıştır.
Bulgular: Çalışmaya 36-72 ay arasında olan 257 çocuk katılmıştır. Çocukların %47,50'si kız ve yaş ortalamaları 56,88±1,04 ay idi. Çocukların boy ortalamaları 107,48±0,74 cm, kilo ortalamaları 18,67±0,35 kg ve vücut kitle indeksi ortalamaları 16,11±0,20 kg/m^2 olarak saptanmıştır. Çocukların %82,90'ı normal kilolu, %13,20'si aşırı kilolu ve %3,50'si obez olarak saptanmıştır. Çocukların %12,80'inde bir göz problemi, %7,00'ında işitme problemi, %14,80'inde diş problemi, %4,70'sinde bitlenme, %1,90'ında kısa frenulum saptanmıştır. Erkeklerin %10,40'ında ürogenital bir problem saptanmış olup %2,98'inin inmemiş testisi vardı.
Sonuç: Bu çalışmada en sık saptanan patoloji diş ve göz problemleriydi. Okul öncesi sağlık taramaları, okul ve toplum sağlığını etkileyecek önemli sorunların önceden tespitini sağlaması ve önlemlerin alınması için birinci basamak hekimlerine fırsatlar sunmaktadır.
Anahtar kelimeler: Çocuk sağlığı, çocukluk çağı obezitesi, aşırı kiloluluk, kırma kusuru, ağız-diş sağlığı

Correspondence / Yazışma Adresi:
Dr. Mustafa Kürşat Şahin
Ondokuz Mayıs University, Department of Family Medicine, Samsun
e-mail: m.kursatsahin@yahoo.com
Date of submission: 17.01.2017
Date of admission: 07.04.2017

Introduction

The school environment has impacts directly on health through its physical and social surroundings. School is an important institution for health services because it provides a highly suitable environment for the development of positive health-related attitudes and behaviors and the provision of mass social services.[1] The objectives of health services in nursery school are for all children of nursery school age in the community to achieve and maintain the best physical, psychological and social health, to ensure that schoolchildren grow up in a healthy environment and to improve the health levels of children, their families and society. In that context, school health workers represent the basic and most important component of primary health services.[2]

Student health involves preserving and improving health, preventing diseases, establishing definite diagnosis by identifying health problems and treating these if necessary, and providing emergency care in case of sudden onset diseases and injuries and health-related education and counseling. Children are constantly growing and developing, for which reason their development must be constantly monitored. Problems such as vision disorder, hearing loss, growth-developmental delay, orthopedic disorders, and tooth decay, which are commonly observed in this period and can be treated by being identified through screening examinations must be assessed through screening programs in addition to periodic physical examinations.[3,4]

The purpose of this study was to assess the health status of children at five nursery schools within the Artvin Central Community Health Center (CHC) region using a school health screening program.

Materials and Methods

This cross-sectional, descriptive study was performed on 01-25 December, 2013, in the Artvin Central CHC region. The Artvin city center lies in the Northeast Black Sea region of Turkey and has a population of 30 thousand. Two hundred ninety children, aged 36-72 months, attending all five nursery schools in the Central CHC service area, were included in the study. The residential areas in the area are economically and socially homogeneous. Assuming that a 15.00 % of children have any health problem, with deviation of 20.00 %, type 1 error (alpha) 0.05 and type 2 error (beta) 0.20 (power = 0.80), at least 196 children were required for the study. Two hundred fifty-seven (88.62%) students who were present in school on the days when the screenings were performed and who agreed to participate were enrolled. The requisite permissions were obtained from the Provincial Education Directorate before data collection. Schools were notified before data collection, students' families were informed by the schools, and written consents were then obtained from families. School administrators were asked for a spacious, quiet and light area for examinations and assessments and appropriate areas were provided by the authorities responsible.

First girls and then boys underwent visual, hearing, oral and dental health and systemic examinations including height and weight measurements in small groups.

Students were weighed unclothed and in bare feet using a SECA digital floor scale (sensitive to 0.10 kg). Height was measured with students in bare feet, standing on a flat surface, with heels and shoulders touching the wall using a non-elastic strip measure accurate to 0.10 cm attached to the wall. Body mass index (BMI) was obtained from these weight and height measurements. Growth standards for children aged 0-5 and growth reference values for children and adolescents in the 5-19 age group were published by the World Health Organization (WHO) in 2007. BMI for age values thus began being used for the classification of overweight and obesity in children and adolescents. Based on WHO recommendations, >+2 SD in children under 5 is regarded as overweight and >+3 SD as obesity, while in the 5-19 age group >+1 SD is regarded as overweight and >+2 SD as obesity.[5-7]

Refraction errors and strabismus were investigated during eye examinations. A Snellen chart was used to assess refractive errors. Students using glasses were assumed to have refractive errors and were examined with glasses for the purpose of control. Visual acuity of 0.7 decimals (D) or less from 6 meters were regarded as pathological (suspected refractive error), and a difference of 0.2 D or more between the two eyes was regarded as amblyopia. For strabismus evaluation, students were asked to look at a fixed point. A light source was used, and light reflexes being in the same location in both eyes were regarded as normal.[2,4,8]

Audiological examination was performed with the whispered voice test from 6 meters and the Rinne and Weber test, and a diapason and otoscope were used for ear examinations. In order to evaluate the conduction pathway, a vibrating diapason was placed against the mastoid bone. When the vibrations were no longer perceived by the bone, the diapason was brought in front of the ear. Inability to hear the vibrations for at least 15 sec was regarded as pathological. The diapason was then again caused to vibrate and placed on the vertex. Vibration lateralization to the right or left was regarded as pathological.[4]

At oral and dental hygiene examinations, numbers of decayed teeth and malocclusions were evaluated. Systemic examination involved the hair, hairy skin, head, nose, neck, cardiovascular system, respiratory system and abdominal examination, together with the undescended testis examination for boys. Screening results were recorded for each patient. Data were shared with class teachers, who then passed these on to parents. Students with problems identified during examinations were notified to their teachers and were referred to family physicians.

The data were then transferred to SPSS 22.0 statistical software. These data were expressed as number, percentage, mean ±2 standard error and 95% confidence interval. The distribution of the data was evaluated by Kolmogorov-Smirnov Test. Statistical significance was tested using the chi square and independent samples t tests. $p<0.05$ was regarded as significant.

Results

Two hundred fifty-seven children aged 36-72 months (47.50% girls), and with a mean age of 56.88±1.04 months were included in the study. Children's mean height was

107.48±0.74 cm, mean weight was 18.67±0.35 kg and mean BMI was 16.11±0.20 kg/m² (Figure 1). No statistically significant difference was determined in terms of age, height, weight or BMI between the sexes (Table 1). Of the children taking part, 82.90% were of normal weight, 13.20% were overweight and 3.50% were obese. Among the girls, 81.10% were normal weight, 14.80% were overweight and 4.10% were obese, while among the boys, 84.40% were normal weight, 11.90% were overweight and 3% were obese normal. One child with a BMI for age z score less than -2SD was identified as underweight. Children's normal weight, overweight and obesity status by months is shown in Figure 2. No significant variation was observed between sex and overweight or obesity status ($\chi 2$= 0.705; p=0.401). When children were classified as under or over 5 years of age, statistically significantly greater obesity and overweight were observed in the 5 year and over age group ($\chi 2$=7.212; p=0.007).

An ocular problem was determined in 12.80% of children, hearing problems in 7%, teeth problems in 14.80%, lice in 4.70% and a short frenulum in 1.90% (Table 2). A urogenital problem was identified in 10.40% of boys, and undescended testis in 2.98%. Amblyopia was determined at a level of 1.16%, strabismus at 2.72% and refractive error at 10.50%. Significantly more ear problems were determined in boys than in girls ($\chi 2$=4.948; p=0.026). Ear wax plugs represented 66.60% of ear pathologies. Lice were more prevalent among girls than boys ($\chi 2$=6.492; p=0.011). No statistically significant difference was determined between the sexes in terms of other health problems. No statistically significant relation was determined between age and health problems.

Discussion

School screenings are important for social health in regions in which access to the health system is problematic, particularly for economic, geographic, social or cultural reasons. Families in these regions do not generally take their children for routine check-ups and only present to health institutions when they are severely ill. Treatment may be delayed and diseases become chronic since conditions cannot be diagnosed early.[9]

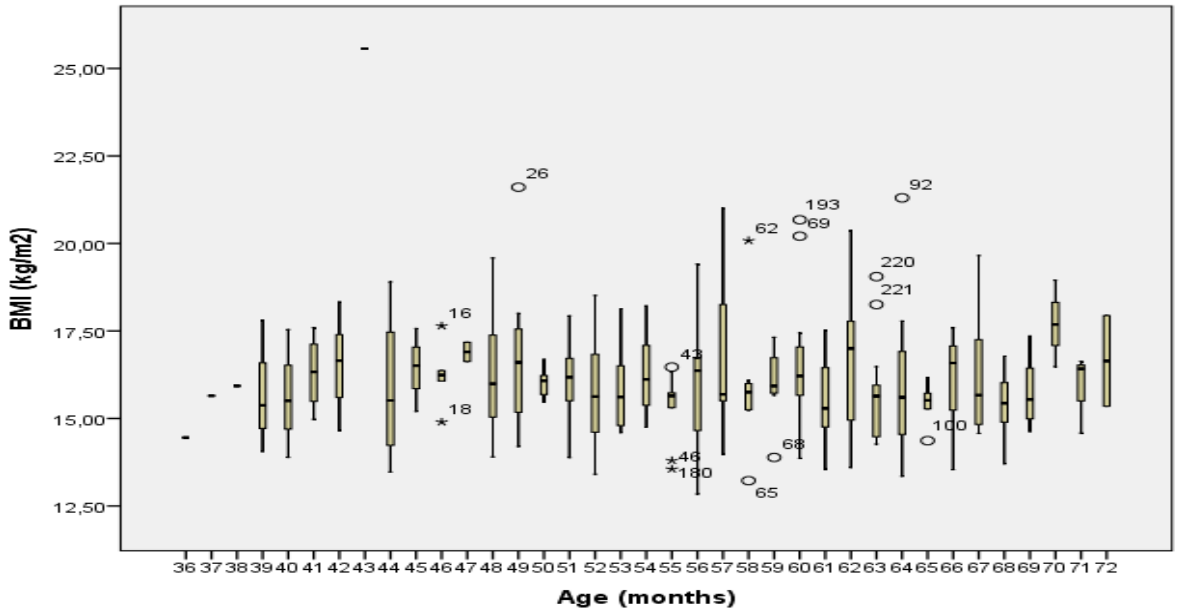

Figure 1. Body mass index by age (months)

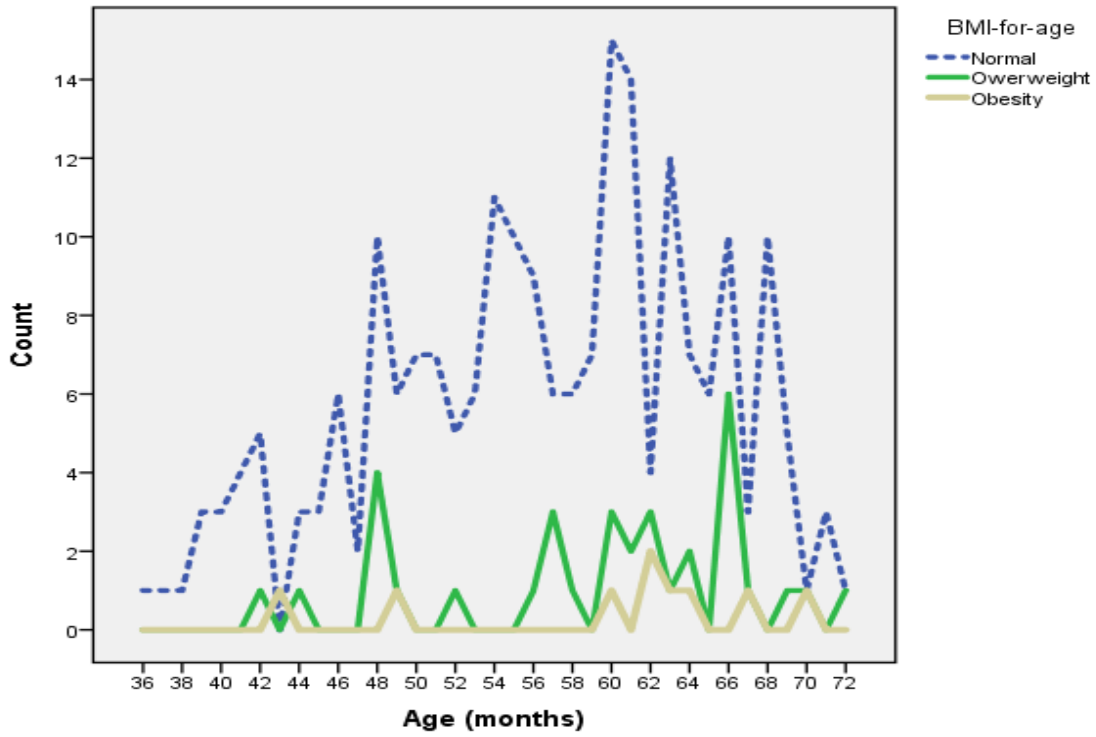

Figure 2. Normal weight, overweight and obesity by age (months)

Mean body weights of the children aged 36-72 months were 18.80±0.46 kg for boys and 18.52±0.53 kg for girls, and mean BMI values were 16.01±0.11 kg/m² for boys and 16.22±0.34 kg/m² for girls. In a study from Ankara, Yabancı et al. reported body weights of 19.50±3.30 kg in boys under 5 and 18.10±3.10 kg in girls, with BMI values of 15.90±1.80 kg/m² for boys and 15.5±1.80 kg/m² for girls.[10] In a study performed in a kindergarten in Istanbul, Yalvaç et al. determined weight and BMI values of 17.60±2.50 kg and 15.60±1.50 kg/m² in boys aged 5-6 and of 17.70±2.00 kg and 15.90±1.30 kg/m² in girls.[11] A study from 10 separate regions in America reported weight and BMI values of 18.70±2.60 kg and 16.10±1.50 kg/m² in boys aged 4.5 years and of 18.20±2.70 kg and 16.00±1.60 kg/m² in girls.[12] Body weight and BMI values for children aged 4.5 years in Canada were reported as 20.50± 3.50 kg and 16.70±1.90 kg/m² in boys and 20.20±3.90 kg and 16.60±2.30 kg/m² in girls.[13] Our findings are compatible with those of other studies.

Table 1. Difference between age, height, weight and BMI by gender

	Girls Mean±2SE	Boys Mean±2SE	All Mean±2SE	All 95% CI	Independent Samples t-Test p value
Age (months)	56.71±1.55	57.04±1.40	56.88±1.04	55.86-57.91	0.756
Height (cm)	106.72±1.04	108.16±1.05	107.48 ±0.74	106.75-108.21	0.053
Weight (kg)	18.52±0.53	18.80±0.46	18.67±0.35	18.33-19.01	0.418
BMI (kg/m²)	16.22±0.34	16.01±0.11	16.11± 0.20	15.91-16.31	0.327

SE: Standard Error, 95% CI: 95% Confidence Interval for Mean

Table 2. Health problems by gender

Health problem		Girls		Boys		All	
		n	%	n	%	n	%
Eye problems	No	106	86.90	118	87.40	224	87.20
	Yes	16	13.10	17	12.60	33	12.80
Ear problems	No	118	96.70	121	89.60	239	93.00
	Yes	4	3.30	14	10.40	18	7.00
Dental problems	No	106	86.90	113	83.70	219	85.20
	Yes	16	13.10	22	16.30	38	14.80
Lice	No	112	91.80	133	98.50	245	95.30
	Yes	10	8.20	2	1.50	12	4.70
Short frenulum	No	121	99.20	131	97.00	252	98.10
	Yes	1	0.80	4	3.00	5	1.90

Although obesity is observed in all age groups, it is more common at ages when rapid fat deposition occurs. In childhood, it is more common in the first year of life, between the ages of 5 and 6 and in puberty. The overweight status between the ages of 5 and 6 is compatible with this. Obesity that begins before the age of 5 and after 15 is more dangerous. Twenty four to forty-one percent of fat children at pre-school ages and 42-63% of fat school children have been shown to remain fat in adulthood.[14] In our study, 82.90% of children were normal weight, 13.20% were overweight and 3.50% were obese. In the Surveillance on Growth Monitoring in School-Aged (6-10 Age Group) Children in Turkey (TOÇBİ) project, 6.50% of children in Turkey as a whole were obese, 14.30% were overweight, 7.90% were underweight, 1.30% were very underweight and 70.00% were of normal body weight.[7] According to Turkish Nutrition and Health Research (TBSA) data, the prevalence of overweight among children aged 0-5 years is 17.90% and the prevalence of obesity is 8.50%.[15] Kalyoncu et al. identified 1.00% of children as very underweight, 4.80% as underweight, 75.90% as normal, 15.80% as overweight and 2.50% as obese.[2] In a study of children aged 37-72 months, Önsal et al. concluded that 11.10% were overweight and 3.40% were obese.[16] Lower levels of overweight and obesity were determined in our study compared to the TOÇBİ and TBSA studies. This may be due to regional variation.

Vision disorders are one of the most common health problems in childhood, and visual screening is the most important means of revealing these. Vision is a function learned after birth, and visual acuity reaches the ideal, full, level at approximately the age of 3 years. Visual stimuli are very important in terms of the development of normal vision. In the development of normal vision, the brain must receive a simultaneous, clear focused image from both eyes. Visual acuity screening therefore needs to be performed on children at the age of 3-4, because refraction defects identified at these ages, such as

myopia, hypermetropia and astigmatism, can lead to interruption of visual pathway development and to amblyopia. Amblyopia can lead to a decrease in perception and binocular vision and to decreased school success.[17-18] Vision problems were determined in 12.80% of children in our study – 1.16% amblyopia, 2.72% strabismus and 10.50% refraction error. Eye examinations in a study from Eskişehir revealed refraction error in 10.50% of students, amblyopia in 6.20% and strabismus in 3.10%.[2] At least one refraction error was determined in 12.20% of 1st year students in a study from Ankara.[18] Eye screening in Kırıkkale revealed refraction index in 17.50% of the subjects, strabismus in 2.40% and amblyopia in 1.20%.[19] A screening study of 2480 children in the 3-6 age group in China determined myopia in 2.50%, hypermetropia in 20.00% and astigmatism in 6-11%.[20] Our study data are compatible with those of previous studies.

The incidence of congenital hearing loss based on global averages ranges between 1/800 and 1/1500. Turkey is one of the countries with the highest levels of congenital hearing loss. Approximately 2500 babies are born with hearing loss in Turkey every year. The level of hearing loss up to school age rises to 5/1000. It is useful for hearing disorders to be diagnosed before children start school.[4] Ear pathologies were determined in 7.00% of children in this study, with ear wax plugs representing 66.60% of these. Kalyoncu et al. determined ear wax plugs in 48.70% of students in their study, membrane perforation in 2.50% and hearing loss in 3.10%.[2] Aydın et al. evaluated ear wax plugs as representing 82.80% of the 23.20% ear pathologies in their study.[21] A lower level of ear pathologies was determined in our studies compared to previous research. This may be due to increased hearing screenings being performed in Turkey as a whole.

Tooth decay is the most common chronic disease in children. The acids resulting from the breakdown of carbohydrates by bacteria in the oral environment appear with the destruction of dental structures. Tooth decay is diagnosed though visual intraoral examination. Black or brown areas of decay and loss of dental tissue is observed. Early diagnosis and treatment planning are very important.[4] Dental problems were determined at a level of 14.80% in this study. Kılınç et al. reported a low level of tooth decay in children aged 3 (9.80%) and 4 (25.60%) years, but that these rose by the ages of 5 (44.40%) and 6 (44.80%).[22] Tulunoğlu et al. reported that 83.70% of children aged 3 were free of tooth decay, 51.40% of children aged 4, 32.10% of those aged 5 and 42.00% of children aged 6.[23] In a study performed across Turkey, Doğan et al. determined a decay level of 69.80% in children aged 5.[24] Gücük et al. determined tooth decay in 51.3% of students[25], Kalyoncu et al. in 64.80%[2], Açık et al. in 64.60% [26], and Aydın et al. in 77.70%.[21] The incidence of dental problems in our study was lower than that in previous research.

Undescended testis, observed in 3.50-5.50% of term births is one of the most common congenital urological anomalies in childhood. Infertility and malignity development are the most important potential long-term complications. The malignity potential in undescended testis is 5-40 times higher than that of normal testes. The earlier undescended testes are treated, the greater the preservation of fertility potential. The incidence of undescended testis ranges between 0.76% and 0.96% at school age.[27,28] In a nationwide study in Turkey, Yücesan et al. reported that undescended testes represent 0.90% of the total prevalence of congenital anomalies in school children. [29] Aydın et al. performed urogenital system examination on boys and identified a 3.30%

pathology level. The incidence of undescended testis was 2.30%.[21] Kalyoncu et al. determined a level of undescended testis of 1.20% following urogenital system examination.[2] Gücük et al. determined a prevalence of undescended testes of 0.90%.[25] Similar findings were obtained in our study to those of previous research.

In conclusion, children with visual, hearing and dental problems were identified in this study. Another determined finding was overweight and obesity. Early intervention is particularly important in this age group. Healthier individuals can be produced by effective primary health services. Continuous and comprehensive family health services represent a matchless opportunity for these children to be healthy from babyhood to adulthood. Early intervention will make particular positive contributions to children's visual and hearing problems. Early intervention in conditions identified in nursery school children will be of great benefit to school and social health.

References

1. Allison MA, Crane LA, Beaty BL, Davidson AJ, Melinkovich P, Kepme A. School-based Health centers: improving Access and quality of care for low-income adolescents. Pediatrics. 2007;120(4):887-94.
2. Kalyoncu C, Metintas S, Baliz S, Arikan I. Thelevel of health in Elementary School Students in Training and Research Areas and Evaluation of School Screening Examination Results. TAF Prev Med Bull 2011;10(5):511-8.
3. Gündüz S, Albayrak HM. Where are we in school health? Ankara Medical Journal. 2014;14(1):29-33.
4. T.C. Sağlık Bakanlığı Sağlık Hizmetlerinde Okul Sağlığı Kitabı. T.C. Sağlık Bakanlığı Refik Saydam Hıfzıssıhha Merkezi Başkanlığı Hıfzıssıhha Mektebi Müdürlüğü. Ankara: Yücel Ofset Matbaacılık; 2008.
5. WHO. Child growth standards. BMI-for-age. [internet] http://who.int/childgrowth/standards/bmi_for_age/en/ (Erişim tarihi: 23.12.2016)
6. WHO. Growth reference 5-19 years. BMI-for-age (5-19 years). [internet] http://www.who.int/growthref/who2007_bmi_for_age/en/ (Erişim tarihi: 23.12.2016)
7. Türkiye'de Okul Çağı (6-10 Yaş Grubu) Çocuklarında Büyümenin İzlenmesi (TOÇBİ) Projesi Araştırma Raporu, Sağlık Bakanlığı, Temel Sağlık Hizmetleri Genel Müdürlüğü, Sağlık Bakanlığı Yayın No:834, Ankara: Kuban Matbaacılık; 2011.
8. Işıklı B, Kalyoncu C, Metintaş S, Arslantaş D, Ünsal A. Eskişehir kırsal ilköğretim öğrencilerinde görme kusurları. Sürekli Tıp Eğitimi Dergisi 2007;16(17):95-9.
9. Ece A, Ceylan A, Gürkan F, ve ark. Diyarbakır ve çevresi okul çocuklarında boy kısalığı, düşük ağırlık ve obezite sıklığı. Van Tıp Dergisi 2004;11(2):128-36.
10. Yabancı, Nurcan, Işıl Şimşek, Hakan İstanbulluoğlu ve Bilal Bakır. Ankara'da Bir Anaokulunda Şişmanlık Prevalansı ve Etkileyen Etmenler. TAF Preventive Medicine Bulletin 2009;8(5):397-404.
11. Yalvaç S, Erkan T, Erginöz E, Çokuğraş FÇ, Kutlu T. Bahçelievler çocuk yuvası 0-6 yaş grubunda beslenme durumunun değerlendirilmesi. Türk Ped Arş 2008;43:89-93.
12. Nader PR, O'Brien M, Houts R, et al. National Institute of Child Health and Human Development Early Child Care Research Network. Identifying risk for obesity in early childhood. Pediatrics 2006;118:e594-601.
13. Twells LK, Newhook LA. Obesity prevalence estimates in a Canadian regional population of preschool children using variant growth references. BMC Pediatrics 2011; 11:21.
14. Köksal G, Özel G. Okul Öncesi Dönemde Obezite. Sağlık Bakanlığı. Ankara: Klasmat Matbaacılık; 2008;729:1-32.
15. Türkiye Beslenme ve Sağlık Araştırması 2010: Beslenme Durumu ve Alışkanlıklarının Değerlendirilmesi Sonuç Raporu, Sağlık Bakanlığı Yayın No: 931. Ankara: 2014. http://www.sagem.gov.tr/TBSA_Beslenme_Yayini.pdf, Erişim tarihi: Ocak 2017.

16. Önal S, Özdemir A, Meşe C, Koca Özer B. Okul öncesi Dönem Çocuklarda Malnütrisyon ve Obezite Prevelansının Değerlendirilmesi: Ankara Örneği. DTCF Dergisi 2016;56(1):210-25.
17. Kabataş EU, Kabataş N, Yabanoğlu N. Rize Devlet Hastanesi Göz Polikliniğine Başvuran 6-15 Yaş Arası Çocuklarda Kırma Kusurlarının Biyometrik Değerler İle İlişkisi. Ortadoğu Tıp Dergisi 2013;5(1):25-8.
18. Ankara İli'nde İlkokul 1.Sınıf Öğrencilerinde Gözde Kırma Kusurları Sıklığının Tespit Edilmesi Araştırması, T.C. Sağlık Bakanlığı Yayın No: 933. Ankara: Türkiye Cumhuriyeti Sağlık Bakanlığı Sağlık Araştırmaları Genel Müdürlüğü; Aralık 2013, http://www.sagem.gov.tr/Gozde_Kirma_Kusurlari_Raporu_04_03_2014.pdf, Erişim tarihi: Ocak 2017.
19. Ergin A. Kırıkkale Merkezi İlkokul Birinci Sınıflarda Göz Taraması Sonuçları. T Klin J Med Sci 2001;21:166-72.
20. Lan W, Zhao F, Lin L, Li Z, Zeng J, Yang Z, Morgan IG. Refractive errors in 3-6 year old chinese children: a very low prevalence of myopia? PLoSOne 2013;8(10):e78003.
21. Aydın N, İrgil E, Akış N, Pala K. Nilüfer Halk Sağlığı Eğitim Araştırma Bölgesi'nde Dört İlköğretim Okulundaki Öğrencilerin Sağlık Durumlarının Değerlendirilmesi. Uludağ Üniversitesi Tıp Fakültesi Dergisi 2004;30(1):1-6.
22. Kılınç G, Koca H, Ellıdokuz H. 3-4 yaş grubu çocukların ağız sağlık durumlarının iki yıllık takibi. Dokuz Eylül Üniversitesi Tıp Fakültesi Dergisi 2013;27(1):25–31.
23. Tulunoğlu Ö, Bodur H, Ulusu T, Ciğer R, Odabaş M. Okul öncesi (3-6 yaş)ve okul çağındaki (7-8 yaş) çocuklarda diş yüzeylerindeki çürük dağılımının ve prevalansının karşılaştırmalı olarak değerlendirilmesi. Gazi Üniversitesi Diş Hekimliği Fakültesi Dergisi 2003;20:11-6.
24. Doğan GB, Gökalp S. Türkiyede diş çürüğü durumu ve tedavi gereksinimi, 2004. Hacettepe Diş Hekimliği Fakültesi Dergisi 2008;32:45-57.
25. Gucuk S, Dudak AH. [Evaluation of the Health Screening on Students in the First Year of Primary School: Example of Bolu Province]. TAF Prev Med Bull 2012;11(5): 565-70.
26. Açık Y, Deveci SE, Turacı Çelik G, Karaaslan O. Elazığ Yenimahalle Eğitim Araştırma Sağlık Ocağı Bölgesi"nde bulunan ilköğretim okulları birinci sınıf öğrencilerinin sağlık taraması sonuçlarının değerlendirilmesi. Toplum Hekimliği Bülteni 2006;25(1):30-4.
27. McAninch JW. Disorders of the testis, scrotum and spermatic cord. In: Tanagho E A, -McAninch JW. Smith's General Urology. 15th ed., New Europe: McGraw-Hill; 2000: 684-98.
28. Schneck FX, Bellinger MF. Abnormalites of the testes and scrotum and their surgical management. In: Campbell's Urology (eds.: Walsh PC, Retik AB, Vaughan ED, Wein AJ.), Philadelphia: W.B. Saunders; 2007: p. 3774- 5.
29. Yücesan S, Dindar H, Olcay I, et al. Prevalence of congenital abnormalities in Turkish school children. Eur J Epidemiol 1993;9(4):373-80.