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Why Pediatricians Need to Consult An Otolaryngologist: Analysis of 3774 Patients

Pediatristler Neden Bir Kulak Burun Boğaz Uzmanına Danışır: 3774 Hastanın Analizi

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Abstract

A multidisciplinary approach may be necessary in the diagnosis and management of certain patients; therefore, interdisciplinary consultations have an important place in the medical practice. Diagnosis and management of children with ear, nose and throat (ENT) disorders take part in the practices of both otorhinolaryngologists and pediatricians. The aim of this study to investigate the reasons for pediatric ENT consultations, and examine them in relation with the pediatric age groups and the site of the requests. All pediatric consultations requested from the Otorhinolaryngology Department by the Pediatrics Department [outpatient, inpatient, intensive care unit (ICU) and pediatric emergency room (ER)] in 2021 were examined and included in the study. The pediatricians consulted a total of 3774 children in one-year period. The most common reason for consultation was hearing and/or speech evaluation (19.6%). The frequency of consultations for hearing and/or speech evaluation was significantly higher in early childhood (24.6%) ($p<0.001$) and lower in adolescents (10.7%) ($p<0.001$). The majority of the children consulted were in early childhood (38%) and middle childhood (28.5%). Most of the consultations were requested for outpatients (71.4%). Hearing and/or speech evaluation (26.6%) was the most common reason for outpatient consultations. Respiratory disorders (25.7%) in inpatients, prolonged intubation in the intensive care unit (47.1%) and foreign body (42.7%) in the emergency department were the most common reason for consultation. Pediatric consultations make up a large volume of work particularly in tertiary and higher health centers. Pediatric otorhinolaryngology units of these centers must be armed with equipment suitable for pediatric examination and surgery as well as an audiovestibular unit laboring audiologists and speech-language therapists.
Keywords: Pediatric Emergency Medicine; Otorhinolaryngologic Diseases; Consultation; Pediatricians

Özet

Bazı hastaların tanı ve tedavisinde multidisipliner bir yaklaşım gerekli olabilir; bu nedenle disiplinler arası konsültasyonların tıp pratiğinde önemli bir yeri vardır. Kulak burun boğaz (KBB) rahatsızlığı olan çocukların tanı ve tedavisi hem kulak burun boğaz uzmanlarının hem de pediatristlerin uygulamalarında yer alır. Bu çalışmanın amacı, pediatrik KBB konsültasyonlarının nedenlerini araştırıp, yaş ve talep edile yer ile olan ilişkisini belirlemektir. Pediatri bölümü [ayaktan hasta, yatan hasta, yoğun bakım (YBÜ) ve çocuk acil servisi (AS)] tarafından KBB bölümüne 2021 yılında konsülte edilen tüm pediatrik hastalar incelenerek çalışmaya dahil edildi. Pediatristler bir yıllık süre içinde toplam 3774 hastayı konsülte etti. En sık konsültasyon nedeni işitme ve/veya konuşma değerlendirmesiydi (%19,6). İşitme ve/veya konuşma değerlendirmesi için konsültasyon sıklığı erken çocukluk döneminde anlamlı olarak daha yüksek (%24,6) ($p<0,001$) ve adolesanlarda daha düşüktü (%10,7) ($p<0,001$). Konsülte edilen çocukların çoğunluğu erken çocukluk (%38) ve orta çocukluk (%28,5) yaş grubundaydı. Konsültasyonların çoğu ayaktan hastalar için istendi (%71,4). İşitme ve/veya konuşma değerlendirmesi (%26,6) ayaktan, solunum bozuklukları (%25,7) yatan, uzamış entübasyon (%47,1) yoğun bakım, yabancı cisim (%42,7) ise acil servis konsültasyonlarının en sık sebebiydi. Pediatrik konsültasyonlar, özellikle üçüncü basamak ve üzeri sağlık merkezlerinde büyük bir iş yükü oluşturmaktadır. Bu merkezlerin KBB üniteleri, pediatrik muayene ve cerrahiye uygun ekipmanlar yanı sıra odyolog ve konuşma-dil terapistlerini de bünyelerinde bulunduran bir odyovestibüler ünite ile donatılmalıdır.
Anahtar Kelimeler: Pediatrik Acil Tıp; Kulak Burun Boğaz Hastalıkları, Konsültasyon; Pediatristler

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1. Introduction

A multidisciplinary approach may be necessary in the diagnosis and management of certain patients; therefore, interdisciplinary consultations have an important place in the medical practice. Consultations may be requested for outpatients, inpatients, intensive care unit (ICU) patients or for the patients who are admitted to emergency room (ER).

The diagnosis and management of children with ear, nose and throat (ENT) disorders take part in the practices of both otorhinolaryngologists and pediatricians. Pediatricians may consult children with the otorhinolaryngologists for any congenital or acquired conditions of the ear, upper aero-digestive system, head and neck, nose and paranasal sinuses, as well as for the diagnosis, treatment and rehabilitation of hearing, speech, language and voice disorders. Therefore, nearly all tertiary pediatric medical centers agree that an on-site pediatric otorhinolaryngologist is needed in those centers (1).

The aim of this study is to investigate the reasons for pediatric ENT consultations, and examine them in relation with the pediatric age groups and the site of the requests including pediatric outpatient clinics, pediatrics hospital, ICU and ER, in our 3810-bed quaternary medical center.

2. Material and Methods

This retrospective study was conducted in accordance with the principles of the Declaration of Helsinki. The study protocol was approved by the Institutional Ethics Committee of X University, XXX Hospital (Date:06/04/2022, decree no:2519). Due to the retrospective nature of the study, informed consents were not obtained from the subjects.
All consultation requests to the Otorhinolaryngology Department from the Pediatrics Department (outpatient, inpatient, intensive care unit and pediatric emergency room) between January 1, 2021 and December 31, 2021 were examined using the

hospital's electronic records, and included in the study. Repeated consultations of the patients were excluded if they were requested with the same reason. Pediatric consultations requested from other departments were not included. The gender, age, the reason for consultation, and the site of consultation request (outpatient, inpatient, ICU or ER) were recorded.

The patients included in the study were classified according their ages into groups as following: neonates (birth - 27 days), infants (1 month - 12 months), toddlers (13 months - 24 months), early childhood age (25 months - 71 months), middle childhood age (72 months - 143 months) and adolescents (144 months – 18 years).

2.1. Statistical analysis

The statistical analyses were made using SPSS ver. 14.0 software (SPSS Inc., Chicago, IL, USA). Categorical variables are presented as frequencies (n) and percentages (%). Chi-square test was used for comparisons of independent groups in terms of categorical variables. For continuous variables, Kolmogorov-Smirnov test was used to assess the assumption of normality. The variables that did not have a normal distribution are expressed as median (minimum-maximum). A p value <0.05 was considered as statistically significant.

3. Results

A total of 3774 children's consultations were included in the study, there were 1543 (40.9%) female and 2231 (59.1%) male patients. Of the consulted children, 42 (1.1%) were neonates, 326 (8.6%) were infants, 282 (7.5%) were toddlers, 1434 (38%) were in early childhood, 1074 (28.5%) were in middle childhood, and 616 (16.3%) were adolescents. There were 2693 (71.4%) requests for outpatients, 811 (21.5%) requests for ER patients, 183 (4.8%) requests for inpatients, and 87 (2.3%) requests for ICU patients.

When all patients were considered, the most common reason for consultation was hearing and/or speech evaluation (n=740, 19.6%). This was followed by sleep disorders (snoring, mouth breathing, sleep apnea, etc.) in 686 (18.2%), infection in 551 (14.6%), foreign body in 353 (9.4%), trauma in 234 (6.2%) and other reasons in 1210 (32%) patients.

Table 1. The reasons for pediatric consultations in relation with the age groups.

	Neonate (n=42)*	Infant (n=326)*	Toddler (n=282)*	Early Ch. (n=1434)*	Middle Ch. (n=1074)*	Adolescence (n=616)*	AP (n=3774)**
Hearing and/or speech evaluation	9 (21.4)	60 (18.4)	33 (11.2)	353 (24.6)	219 (20.4)	66 (10.7)	740 (19.6)
Sleep disorders	0 (0)	20 (6.1)	32 (11.3)	332 (23.2)	229 (21.3)	73 (11.9)	686 (18.2)
Infection	2 (4.8)	48 (14.7)	65 (23)	197 (13.7)	168 (15.6)	71 (11.5)	551 (14.6)
Foreign body	0 (0)	8 (2.5)	45 (16)	212 (14.8)	65 (6.1)	23 (3.7)	353 (9.4)
Trauma	0 (0)	10 (3.1)	28 (9.9)	82 (5.7)	55 (5.1)	59 (9.6)	234 (6.2)
Breathing disorders	12 (28.6)	102 (31.3)	34 (12.1)	26 (1.8)	14 (1.3)	9 (1.5)	197 (5.2)
Recurrent epistaxis	0 (0)	3 (0.9)	5 (1.8)	42 (2.9)	56 (5.2)	38 (6.2)	144 (3.8)
Vertigo	0 (0)	0 (0)	0 (0)	6 (0.4)	37 (3.4)	75 (12.2)	118 (3.1)
Otalgia	0 (0)	3 (0.9)	3 (1.1)	26 (1.8)	33 (3.1)	18 (2.9)	83 (2.2)
Nasal congestion	0 (0)	0 (0)	0 (0)	5 (0.3)	24 (2.2)	53 (8.6)	82 (2.2)
Epistaxis	0 (0)	0 (0)	2 (0.7)	26 (1.8)	23 (2.1)	24 (3.9)	75 (2)
Chronic cough	0 (0)	1 (0.3)	0 (0)	27 (1.9)	22 (2)	13 (2.1)	63 (1.7)
Head and neck mass	4 (9.5)	11 (3.4)	7 (2.5)	13 (0.9)	18 (1.7)	9 (1.5)	62 (1.6)
Ear wax	0 (0)	9 (2.8)	4 (1.4)	20 (1.4)	16 (1.5)	9 (1.5)	58 (1.5)
Hoarseness	0 (0)	2 (0.6)	1 (0.4)	19 (1.3)	20 (1.9)	7 (1.1)	49 (1.3)
Prolonged intubation	0 (0)	21 (6.4)	3 (1.1)	7 (0.5)	3 (0.3)	7 (1.1)	41 (1.1)
Dysphagia	0 (0)	5 (1.5)	1 (0.4)	8 (0.6)	12 (1.1)	9 (1.5)	35 (0.9)
Facial paralysis	0 (0)	0 (0)	1 (0.4)	6 (0.4)	10 (0.9)	17 (2.8)	34 (0.9)
Chronic headache	0 (0)	0 (0)	0 (0)	1 (0.1)	12 (1.1)	16 (2.6)	29 (0.8)
Chronic nasal discharge	0 (0)	1 (0.3)	4 (1.4)	6 (0.4)	10 (0.9)	3 (0.5)	24 (0.6)
Ankyloglossia	0 (0)	9 (2.8)	4 (1.4)	7 (0.5)	2 (0.2)	0 (0)	22 (0.6)
Choanal atresia	9 (21.4)	6 (1.8)	2 (0.7)	1 (0.1)	0 (0)	0 (0)	18 (0.5)
Tracheostomy problems	0 (0)	2 (0.6)	2 (0.7)	6 (0.4)	4 (0.4)	3 (0.5)	17 (0.5)
Otorrhagia	0 (0)	2 (0.6)	3 (1.1)	4 (0.3)	5 (0.5)	3 (0.5)	17 (0.5)
Hemoptysis	0 (0)	0 (0)	3 (1.1)	0 (0)	5 (0.5)	9 (1.5)	17 (0.5)
Ear malformations	5 (11.9)	1 (0.3)	0 (0)	0 (0)	2 (0.2)	0 (0)	8 (0.2)
Post-tonsillectomy hemorrhage	0 (0)	0 (0)	0 (0)	1 (0.1)	6 (0.6)	1 (0.2)	8 (0.2)
Velopharyngeal insufficiency	1 (2.4)	2 (0.6)	0 (0)	1 (0.1)	2 (0.2)	0 (0)	6 (0.2)
Sudden hearing loss	0 (0)	0 (0)	0 (0)	0 (0)	2 (0.2)	1 (0.2)	3 (0.1)

*AP: All patients; Ch: Childhood; *N (%) within the age group; **N (%) in all patients included.*

The most common reason for consultation in neonates was respiratory disorders (wheezing, stridor, dyspnea, etc.) (n=12/42, 28.6%). This was followed by choanal atresia and hearing and/or speech evaluation (n=9, 21.4% for both). Of all neonates, 26 (62%) were outpatients, 1 (2%) was an inpatient, 1 (2%) was consulted from the ER, and 14 (34%) were in the ICU.

Similar to neonates, respiratory disorders were the most frequent cause of ENT consultations in infants (n=102/326, 31.3%). Hearing and/or speech evaluation (n=60, 18.4%) and infection (n=48, 14.7%) were the second and third most common causes. Of the infants, 213 (65%) were outpatients, 51 (16%) were inpatients, 29 (9%) were consulted from ER, and 33 (10%) were ICU patients.

Infection was the most common reason for consultation in toddlers (n=65/282, 23%). Foreign body was in the second place (n=45, 16%). These were followed by respiratory disorders (n=34, 12.1%), hearing and/or speech evaluation (n=33, 11.7%), and sleep disorders (n=32, 11.3%). Toddlers were consulted most frequently as outpatients (n=153, 54.3%), 32.2% of them were consulted from the ER, 11% were inpatients and 2.5% were ICU patients.

In early childhood, the most common reason for consultation was hearing and/or speech evaluation (n=353/1434, 24.6%) followed by sleep disorders (n=332, 23.2%), foreign body (n=212, 14.8%) and infection (n=197, 13.7%). Of the early childhood patients, 1023 (71.4%) were outpatients, 41 (2.8%) were inpatients,

356 (24.8%) were ER patients and 14 (1%) were ICU patients.

For middle childhood patients, the most common reason for consultation was sleep disorders (1074/229, 21.3%). This was followed by hearing and/or speech evaluation in (n=219, 20.4%) and infection (n=168, 15.6%). The patients in this age group were most frequently consulted on an outpatient basis (n=847, 79%). The number of inpatients was 33 (3%), the number of ER patients was 186 (17.3%), and the number of ICU patients was 8 (0.7%).

Adolescents were consulted most frequently for vertigo (75/616, 12.2%), followed by sleep disorders (n=73, 11.9%), infection (n=71, 11.5%), and hearing and/or speech evaluation (n=66, 10.7%). Of the adolescents, 431 (70%) were outpatients, 26 (4.2%) were inpatients, 11 were ICU patients (1.8%) and 148 (24%) were ER patients.

The frequency of consultations for hearing and/or speech evaluation was significantly higher in early childhood (24.6%) ($p<0.001$) and lower in adolescents (10.7%) ($p<0.001$). The frequency of sleep disorders as the cause of consultations was significantly higher in early childhood (23.2%) and middle childhood (21.3%) ($p<0.001$ and $p=0.002$, respectively). Similarly, the frequency of consultations due to infection was significantly higher in early childhood (23.4%) ($p<0.001$) and middle childhood (21.6%) ($p=0.001$). The consultations due to foreign body were significantly higher in toddlers (16%) and in early childhood (14.8%) ($p<0.001$) and significantly lower in infants (2.5%) and in middle childhood (6.1%) ($p<0.001$). The frequency of consultations for respiratory disorders was significantly higher in neonates (28.6%), infants (31.3%) and toddlers (12.1%), while it was lower in early childhood (1.3%), middle childhood (1.3%) and adolescents (1.5%) ($p<0.001$).

The most common reason for outpatient consultations (n=2693) was hearing and/or speech evaluation (n=717, 26.6%). This was followed by sleep disorders (n=680, 25.3%), infection (n=406, 15.1%), recurrent epistaxis (143, 5.3%), respiratory disorders (117, 4.3%), and vertigo (105, 3.9%) (Table 2). Of the outpatients consulted, 1023 (38%) were in early childhood. There were 847 (31.5%) patients in middle childhood group, 431 (16%) patients in adolescence group, 213 (7.9%) patients in infant group, 153 (5.7%) patients in toddler group, and 26 (1%) patients in neonate group.

The most common reason for inpatient consultations was breathing disorders (n=47/183, 25.7%). This was followed by infection (n=46, 25.1) and hearing and/or speech evaluation (n=23, 12.6%) (Table 2). Of the hospitalized patients, 51 (27.9%) were infants, 41 (22.4%) were in early childhood, 33 (18%) were in middle childhood, 31 (16.9%) were toddlers, 26 (14.2%) were adolescents and 1 (0.5%) was a neonate.

The most common reason for intensive care consultations was prolonged intubation (n=41/87, 47.1%). This was followed by respiratory disorders (n=23, 26.4%) and choanal atresia (n=7, 8%) (Table 2). Of the intensive care patients, 33 (37.9%) were infants, 14 (16.1%) were neonates, 14 (16.1%) were in early childhood, 11 (12.6%) were adolescents, 8 (9.2%) were in middle childhood and 7 (8%) of them were toddlers.

The most common reason for ER consultations was foreign body (n=346/811, 42.7%), followed by trauma (n=227, 28%), infection (n=94, 11.6%), and epistaxis (n=61, 7.5%) (Table 2). Of the ER patients, 356 (43.9%) were in early childhood, 186 (22.9%) were in middle childhood, 148 (18.2%) were adolescents, 91 (11.2%) were toddlers, 29 (3.6%) were infants, and 1 (0.1%) was a neonate. Among the foreign body consultations, the most common was a foreign body in the nose (58.4%). This was followed by foreign bodies in the external ear canal (22.2%), oropharynx (14.4%), and larynx (5%).

Table 2. The sites of the pediatric consultation requests.

	Outpatient clinic N=2693 (%)*	Hospitalized patients N=183 (%)*	ICU N=87 (%)*	ER N=811 (%)*
Hearing and/or speech evaluation	717 (26.6)	23 (12.6)	0 (0)	0 (0)
Sleep disorders	680 (25.3)	6 (3.3)	0 (0)	0(0)
Infection	406 (15.1)	46 (25.1)	5 (5.7)	94 (11.6)
Foreign body	7 (0.3%)	0 (0)	0 (0)	346 (42.7)
Trauma	0 (0)	5 (2.7)	2 (2.3)	227 (28)
Breathing disorders	117 (4.3)	47 (25.7)	23 (26.4)	10 (1.2)
Recurrent epistaxis	143 (5.3)	1 (0.5)	0 (0)	0 (0)
Vertigo	105 (3.9)	1 (0.5)	0 (0)	12 (1.5)
Otalgia	65 (2.4)	7 (3.8)	0(0)	11 (1.4)
Nasal congestion	82 (3)	0 (0)	0 (0)	0 (0)
Epistaxis	0 (0)	12 (6.6)	2 (2.3)	61 (7.5)
Chronic cough	63 (2.3)	0 (0)	0 (0)	0 (0)
Head and neck mass	47 (1.7)	10 (5.5)	3 (3.4)	2(0.2)
Ear wax	57 (2.1)	1 (0.5)	0 (0)	0 (0)
Hoarseness	48 (1.8)	1 (0.5)	0 (0)	0 (0)
Prolonged intubation	0 (0)	0 (0)	41 (47.1)	0 (0)
Dysphagia	25 (0.9)	9 (4.9)	1 (1.1)	0 (0)
Facial paralysis	12 (0.4)	4 (2.2)	0 (0)	18 (2.2)
Chronic headache	28 (1)	1 (0.5)	0 (0)	0 (0)
Chronic nasal discharge	23 (0.9)	1 (0.5)	0 (0)	0 (0)
Ankyloglossia	22 (0.8)	0 (0)	0 (0)	0 (0)
Choanal atresia	11 (0.4)	0 (0)	7 (8)	0 (0)
Tracheostomy problems	5 (0.2)	5 (2.7)	3 (3.4)	4 (0.5)
Otorrhagia	5 (0.2)	0 (0)	0 (0)	12 (1.5)
Hemoptysis	11 (0.4)	3 (1.6)	0 (0)	3 (0.4)
Ear malformations	8 (0.3)	0 (0)	0 (0)	0 (0)
Post-tonsillectomy hemorrhage	0 (0)	0 (0)	0 (0)	8 (0.2)
Velopharyngeal insufficiency	6 (0.2)	0 (0)	0 (0)	0 (0)
Sudden hearing loss	0 (0)	0 (0)	0 (0)	3 (0.4)

(%) within clinics; ICU: Intensive care unit; ER: Emergency room.*

Nasal fracture (n=117/227, 51.5%) was the most common cause of trauma-related consultations from the ER. This was followed by intraoral injury (tongue trauma, soft palate laceration, etc.) in 32 patients (14.1%), lip laceration in 26 patients (11.5%), and maxillofacial trauma in 21 patients (9.3%).

In the neonate group, the most common reason for consultation from the ER was infection (n=1, 100%.). Trauma was the most common reason for ER consultation in infants (n=10, 34.5%) and adolescents (n=57, 38.5%). foreign body was the most frequent cause of ER consultation in toddlers (n=45, 49.5%), early childhood (n=208, 58.4%) and middle childhood (n=62, 33.3%).

The frequency of consultation in the emergency department due to respiratory disorders (n=3, 10.3%) was higher in infants than in other groups (p=0.004). Foreign body consultations were higher in the early childhood group (n=208, 58.4%), whereas foreign body consultations in the middle childhood group were less frequent (n=62, 33%) (p<0.001 p=0.002, respectively). Trauma-related consultations were less frequent in the early childhood group (n=79, 22.2%) and more frequent in the adolescent group (n=57, 38.5%) (p=0.001 and p=0.002, respectively).

4. Discussion

Our results indicated that including the holidays, the pediatricians consulted more than 10 children per day to otorhinolaryngology clinic in our 3810-bed hospital, and the most frequent reason for consultation was hearing and/or speech evaluation. In fact, this number is bigger than most of the reported daily ENT consultation requests; for example, Sher et al. (2) reported

that the monthly number of pediatric ENT consultations ranged from 13 consults per month to 69 consults per month in their academic hospital in New York, serving a catchment area of 19 counties.

Although pediatric otorhinolaryngology has been established as a subspecialty of otorhinolaryngology in many countries including USA, otorhinolaryngology does not have any legal subspecialties in our country. Turkish otorhinolaryngologists have founded subspecialty societies as well as subspecialty clinics including otology, rhinology, head and neck surgery, allergy, plastic surgery and pediatric otorhinolaryngology, however, there is currently no legal regulation regarding these subspecialties.

The most common reason for pediatric consultations was evaluation of hearing and/or speech, in 19.6% of all consultations. The rate of consultation for evaluation of hearing and/or speech was higher in neonates, infants, in early childhood and middle childhood, however the group causing a significant difference was early childhood group ($p<0.001$) (Table 1). There is a newborn hearing screening program in our country, the neonates who cannot pass the screening tests are consulted to otorhinolaryngology, and most of the consulted neonates were the ones who did not pass the newborn hearing screening tests.

High frequencies of consultations for hearing and/or speech evaluation in the early and middle childhood may be related to middle ear problems in these ages. Demir et al. (3) reported that 12% of 973 children who applied to pediatrics outpatient clinic with non-otorhinolaryngological complaints had external or middle ear disorders including otitis media with effusion (6.9%), impacted cerumen (3.8%) and even congenital cholesteatoma (0.1%).

Articulation problems are common in early and middle childhood, and they might have been the reason for consulting otorhinolaryngology in the heading of evaluation of hearing and/or speech problems. Our result indicates that any pediatric otorhinolaryngology outpatient clinic must hold an audiology unit, including a speech-language pathologist.

Sleep disorders which include mouth breathing, snoring and sleep apnea were the second most common cause for otorhinolaryngology consultations. Sleep disorders were most frequent reasons in the early and middle childhood consultations ($p<0.001$ and $p=0.002$, respectively, Table 1). In fact, the most frequent cause of snoring and sleep apnea in these age groups is adenoid and tonsillar hypertrophy. Since we did not analyze the otorhinolaryngologic diagnoses in our study, we cannot provide data about the presence of those disorders in the consulted children. This is a limitation of our study.

In our study, the third most frequent cause of all pediatric consultations was infection (14.6%), and the frequency of consultations due to infection was significantly higher in early (23.4%) ($p<0.001$) and middle childhood (21.6%) ($p=0.001$). Infection was one of the most frequent cause for consultation in hospitalized patients (Table 2), and we assume that complicated head and neck infections may be a reason for this. Upper respiratory tract infections were reported as the first cause for emergency pediatric consultations, and it was reported that pediatricians referred their patients to otorhinolaryngology if they had recurrent acute otitis media (4,5).

The majority (71.4%) of the consulted children were outpatients in our study. In contrast, Sandra et al. (6) reported that only 1.94% of their pediatric consultation cases were referred. In fact, outpatient consultations have been increasing in our hospital in the recent years, probably due to medicolegal considerations. Sher et al. (2) of USA reported that otolaryngology consult volume increased by 144% in four years in their academic institution.

In our study, the most frequent cause for pediatric outpatient consultations were hearing and/or speech evaluation, sleep disorders and infection, in rank order (Table 2). Sandra et al. (6) reported the most common causes of outpatient pediatric consultations as infectious causes, including otitis and tonsillitis. Hearing and/or speech

problems were not mentioned as the cause of pediatric outpatient consultations in that study (6). It seems that pediatricians treat most of the childhood infections in our hospital, and only refer the children with complicated head and neck infections to otorhinolaryngology.

Breathing disorders were the most common cause of consultation in inpatients in our study, followed by infection. Prolonged intubation and breathing disorders were the most common reasons in ICU patients. Choi et al. (7) reported airway evaluation as the most frequent cause for ENT consultation in inpatients.

The most common reason for ER consultations was foreign body (42.7%) in our study (Table 2). Similarly, Topuz (8) reported that nasal foreign body was the most common reason for ENT consultations in children. In fact, nasal foreign bodies constituted the majority of the foreign bodies in our study (58.4%). We found trauma as the second cause of ER consultations (28%), followed by infection (11.6%). Choi et al. (7) reported that infection was the most frequent cause of pediatric consultations from ER followed by facial lacerations and airway evaluation. Sahin et al. (4)] reported that the most common ER pediatric consultation cause was upper respiratory tract infections in two hospitals included in their study. It seems that pediatric consultation patterns differ in different countries and between the institutions in the same country.

Pediatric age has been divided into six age groups due to children's different anatomical and physiological characteristics and response to medications by age (9). In our study, the majority of the consultations (66.5%) were requested for the children in the early and middle childhood. Our result is in agreement with Sandra et al. (6), who reported that 53.4% of 309 pediatric consultations were requested for the children between the 3 and 12 years of age.

Infant consultations were relatively small in our study (1.1%). Most of the consulted infants (62%) were outpatients, and the most frequent cause for consultation was respiratory problems including stridor and dyspnea in 31.3% of the cases. The reasons at the second rank were hearing and/or speech evaluation (18.4%) (Table 2). Most of the infants were outpatients, and we suppose that this is due to referral of the patients from other hospitals in our country.

It is interesting that the most common cause for consultation was vertigo in adolescents (12.2%). It has been reported that the exact incidence of vertigo in adolescence is not known, and the majority of them are diagnosed with migraine (10).

Our study has some limitations. First, the otorhinolaryngological diagnoses and the management of the consulted children were not examined. Second, our study includes the data of only one year, 2021, and was performed during COVID-19 pandemic, therefore our data may not reflect out-of-pandemic conditions and cannot provide any information on the alterations of the volume of consultations in time.

In conclusion, pediatric consultations make up a large volume of work particularly in big health centers. Pediatric otorhinolaryngology units of these centers must be armed with equipment suitable for pediatric examination and surgery as well as an audiovestibular unit laboring audiologists and speech-language therapists.

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