

Hospital-Based Analysis of ENT Diseases Among Children in Sargodha

Sajid Rashid Nagra¹, Zeeshan Ali², Dileep Kumar³, Furqan Mirza⁴, Saad Rashid⁵,
Sana Muhammad Sadiq⁶

¹Rai Medical College, Sargodha, ²Bahrain National Guards Hospital, Bahrain, ³People's University of Medical and Health Sciences, Nawabshah, ⁴Jinnah Medical and Dental College, Karachi, ⁵Rehbar Medical College, Lahore, ⁶Niazi Medical and Dental College, Sargodha.

Abstract

Background: Children account for a large segment of the Pakistani population. Ear, Nose, and Throat (ENT) diseases can significantly hinder their developmental milestones, impacting physical growth, cognitive abilities, and social well-being.

Objective: To determine the frequency and distribution of common ENT diseases among children in Sargodha.

Methods: This retrospective study was conducted at the Department of Otorhinolaryngology, Rai Medical College Teaching Hospital, Sargodha using data from June 2021 to May 2024. The data of the patients, aged 06 months to 15 years, who presented with ear, nose or throat problem, were included in the study. The missing data, history of any devastating illnesses were excluded. Age, gender, residential area, joint or nuclear family system, parents' education were important sociodemographic factors of interest. Statistical Package for Social Sciences (SPSS) Software version 23.0 was used for data entry and analysis.

Results: Out of 2580 children, male were predominant (58.5%) and the mean age was 4.92 ± 3.84 years. Majority of them were living in rural areas (41.4%) and in joint families (79%). A large proportion was exposed to passive smoking (66.3%) and their mothers lacked formal education (65.5%). The commonly seen ENT disorders were throat diseases (48.6%), followed by ear diseases (29.4%) and nasal diseases (22%).

Conclusion: There is a significant burden of ENT diseases among children in Sargodha, with throat diseases being the most prevalent, followed by ear and nasal diseases, and noteworthy sociodemographic factors influencing disease patterns.

Key words: Adenoiditis, hearing loss, otitis media, rhinitis, tonsillitis.

Introduction

The ENT disorders are among the most common health concerns in children, who constitute approximately 39% of all ENT emergency patients.¹ These conditions, including upper respiratory tract infections often related to adenoid and nasal infections, may lead to complications such as recurrent tonsillopharyngitis, chronic mouth breathing, and even long-term conditions like cor

pulmonale.² Additionally, Eustachian tube dysfunction, owing to its smaller size in children, contribute to various aural complications, affecting hearing and communication skills.³ Thus, a child may present with overlapping conditions such as recurrent adenoiditis may transfer infection to middle ear via eustachian tube.² The coexistence of multiple infections or diseases call attention to the importance of thorough clinical assessment to ensure effective and comprehensive management.

The burden of ENT diseases is predominantly high in low-resource settings, where diagnostic inaccuracies contribute to a 67.4% misdiagnosis rate, resulting in poor record-keeping and underreporting.⁴ Pakistan, a densely populated country, has 45% of its population under the age of 18, many of whom live in underprivileged conditions.⁵ A study conducted in the metropolitan city of Karachi highlights the significant prevalence of pediatric ENT diseases in the region, with 31% of the participants being children, and commonly prevalent pediatric ENT diseases comprised of

Corresponding Author:

Sana Sadiq

Niazi Medical and Dental College
Sargodha.

Email: sanaent1112@gmail.com

Received: 09 November 2024, Accepted: 25 June 2025

Published: 30 September 2025

Authors Contribution

SR conceptualized the project. SRN did the data collection. ZA & FM performed the statistical analysis. ZA, DK & SMS did the literature search. Drafting, revision & writing of manuscript were done by DK, FM & SMS.

Copyright © 2025 The Author(s). This is an Open Access article under the CC BY-NC 4.0 license.

adenoid hypertrophy (13.28%), tonsillitis (12.58%), and otitis media (11.89%).⁶

Chronic inflammatory ENT disorders, such as middle ear infections and tonsillitis, contribute to frequent lost school days, leading to poor academic performance. Additionally, the financial strain of repeated hospital visits further distress families and healthcare systems.⁷ Despite the widespread impact of pediatric ENT diseases, region-specific data in Pakistan particularly for cities like Sargodha remain scarce. The steppe climate of Sargodha District, characterized by extremely hot summers and cold winters, along with smog that exacerbates air pollution,⁸ cultivates a favorable environment for ENT disorders such as recurrent sore throat, eustachian tube dysfunction, discharging ears, hoarseness, hearing loss, and allergic rhinitis etc.

Despite the significant burden, no hospital-based studies on pediatric ENT diseases in Sargodha has been conducted in recent years, highlighting a bit of research gap. The absence of comprehensive local data hampers effective healthcare planning and disease prevention strategies. Therefore, this study aimed to observe the frequency of common pediatric ENT diseases, providing critical insights for targeted interventions and improved healthcare strategies in Sargodha.

Methods

This retrospective study was conducted at the Department of Otorhinolaryngology, Rai Medical College Teaching Hospital, Sargodha. Using non-probability convenience sampling the data of the children was collected from June 2021 to May 2024.

All the children, aged 6 months to 15 years, who presented in the outdoor of Otorhinolaryngology department with a history of ENT disorder, were included in the study regardless of their gender and race. Children with missing data and those with advanced debilitating diseases were excluded from the study. A pre-designed questionnaire was used to collect information including patient demographics (age, gender, and socioeconomic status), clinical presentation (symptoms, duration of illness), diagnosis, and relevant comorbid conditions. To ensure data reliability, two medical officers independently extracted the data, which was then cross-verified by the supervisor. Any discrepancies were resolved through discussion and consensus, and the extracted data was further validated against original case files for accuracy and completeness.

The rules of Helsinki (1964) were followed throughout the study. The SPSS version 23.0 was used for data entry and statistical analysis.

Descriptive analysis was completed for all the study variables. Multinomial regression analysis was done to assess the model fit and the statistically significant relationship of commonly observed sociodemographic characteristics. A p value <0.05 was considered significant.

Results

The data of a total of 2580 children was collected. The mean age was calculated as 4.92 ± 3.84 (0.5-15) years. The male predominance was noted (58.5%) compared to females (41.5%). The residential habitat included rural areas (41.4%), slum areas (36.4%) and urban areas (22.2%). Approximately 79% of the children were living in a joint family system, and 66.31% of the total study participants were exposed to passive smoking inside their households. Most of the families were associated with farming and low income skill-based jobs. Literacy rate was quite low in mothers (65.50%) as compared to fathers (34.88%) who were either completely illiterate or were barely able to read Urdu language (Table-1).

Table 1: Sociodemographic characteristics of study population. (n=2580)

Study Variables	Subcategories	n (%)
Gender	Males	1510 (58.5)
	Females	1070 (41.5)
Residential Habitat:	Rural	1068 (41.4)
	Slum areas	940 (36.4)
	Urban	574 (22.25)
Family system	Joint Families	2038 (79)
	Nuclear families	542 (21)
Second-hand smoking exposure	Exposed population	1711 (66.31)
Parental illiteracy rate	Mothers	1561 (60.5)
	Fathers	900 (34.88)

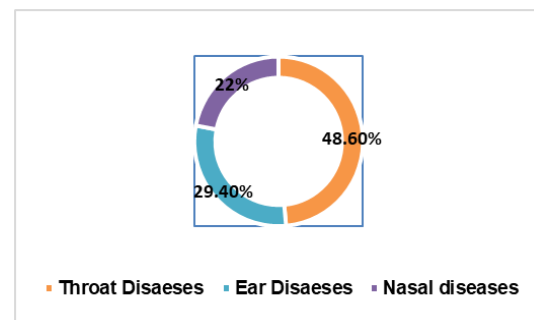


Figure: Frequency of ENT disorders. (n=2580)

Among common ENT disorders observed in the study participants (Figure), throat diseases (48.6%) were most prevalent, followed by ear diseases (29.4%) and nasal diseases (22%).

Table 2: Frequency of commonly treated ear, nose and throat disorders. (n=2580)

Ear (n=758)		Nasal (n=567)		Throat (n=1255)	
Disorders	n (%)	Disorders	n (%)	Disorders	n (%)
Chronic suppurative otitis media	174 (23)	Adenoiditis	147 (26)	Recurrent tonsillitis	339 (27)
Acute suppurative otitis media	167 (22)	Allergic rhinitis	113 (20)	Acute tonsillitis	226 (18)
Otitis media with effusion	91 (12)	Sinusitis	91 (16)	Pharyngitis	213 (17)
Impacted wax	91 (12)	Epistaxis	74 (13)	Hoarseness	188 (15)
Foreign bodies	83 (11)	Acute rhinitis	62 (11)	Oral ulcers	138 (11)
Otitis externa	76 (10)	Foreign bodies	40 (7)	Foreign bodies	126 (10)
Miscellaneous	76 (10)	Miscellaneous	39 (7)	Miscellaneous	25 (2)

The commonly encountered diseases of throat, ear and nose are depicted in Table-2. Multinomial logistic regression analysis was done to assess the relationship between residence (rural, slum, urban) and types of ENT diseases (throat, ear, and nose), adjusting for age and gender. The findings revealed that children from slum areas had significantly higher odds of developing nasal diseases compared to those from urban areas (OR =2.014, $p < 0.001$). Age was a strong predictor, with younger children, particularly those aged two years (OR =7.937, $p = 0.001$) and six years (OR =6.807, $p = 0.002$), being at the highest risk of ENT diseases. Additionally, gender differences showed that males from slum areas were 1.40 times more likely to develop ENT diseases than females (OR = 1.402, $p = 0.003$), while no significant gender association was found in rural and urban groups. The likelihood ratio test confirmed that the overall model was statistically significant ($\chi^2 = 236.298$, $df = 38$, $p < 0.001$), supporting a strong relationship between the predictors and ENT diseases.

Discussion

The findings of present study consisting 2,580 pediatric cases, with a mean age of 4.92 ± 3.84 years (range: 0.5–15 years) are comparable to Sahin et al., who conducted their study in two different regions of Turkey and reported mean ages of 6.3 and 9.6 years.⁹ The burden of diseases in the tender school-going age creates an alarming situation, leading to poor academic performance and abstention from outdoor activities, especially in the presence of chronic inflammatory conditions and hearing loss. At present, the male gender was found to be more affected (58.5%), which is consistent with other studies, such as the one by Briggs et al., who reported a male preponderance of 54.5% in Nigeria.¹⁰ This may reflect parental health-seeking behaviors and the prioritization of male children for medical attention over females, a trend commonly observed in low-resource settings.¹⁰

The sociodemographic characteristics of current study participants, including residence in

rural and slum areas, a joint family system (79%), high rate of passive smoking exposure (66.3%), low-income occupations, and poor maternal literacy rate (65.5%) highlight their vulnerable living conditions. This detrimental effects of substandard living conditions are intertwined with multiple factors such as poor hygiene, overcrowding, and residing in remote area and contribute to delayed visits to specialist clinics and parental negligence in children's care due to multiple social responsibilities particularly in joint families.¹¹ These findings are comparable with other studies, like the one revealed in Bangladesh, where most of their study participants (52.3%) belonged to low income families, and were living in unhygienic environment with large family size.¹² In contrast, a study in Gujarat, India, found that pediatric ENT disorders were more prevalent (73.3%) among children living in nuclear families.¹³ This variability in the results might represent regional housing style.

Currently throat diseases (48.6%) found greatly prevalent, followed by ear (29.4%) and nasal diseases (22%). Similarly, a study by Akram et al. in Mardan reported earwax as the most prevalent ENT disease (18.4%), followed by rhinosinusitis (15.6%), allergic rhinitis (9.7%), and pharyngitis (9.3%) etc.¹⁴ In another study from Bangladesh, the frequency of pediatric ENT disorders was recorded as throat disorder (40.7%) followed by ear disorder (34.8%) and nose disorder (23.9%).¹⁵ A difference is recorded in an Indian study, the maximum number of cases reported about the otological disorders (55.9%) followed by oral cavity (19.3%), throat and nose diseases (18.2%).¹⁶ The frequently treated throat diseases in our set-up included recurrent tonsillitis followed by pharyngitis and acute tonsillitis (Table-2). Recurrent tonsillitis refers to recurrent attacks of throat infections up to 5 times in a year mostly caused by Beta hemolytic streptococci induced infections.¹⁷ Mak et al. recorded the prevalence of chronic tonsillitis as 21.8%, pharyngitis 9.8%, while adenotonsillitis as 8.8%.¹⁶

In this study, among ear diseases, a greater burden of chronic suppurative otitis media was recorded followed by acute suppurative otitis media

and secretory otitis media. The immature eustachian tube may permit the influx of nasopharyngeal secretions in middle ear particularly in presence of recurrent or chronic inflammatory processes in neighboring structures like oropharynx, nasopharynx etc. and arise middle ear complications.³ Interestingly, Briggs et al. recorded cerumen auris (16.9%) and otitis externa (10.2%) as the most frequently diagnosed conditions among pediatric ear disorders.¹⁰ In an Indian study, prevalence of hearing loss among children was noted as 6.6-16.47% and otitis media was identified as its most common cause.¹⁸ According to a global estimate, 97.83 million children and adolescents under the age of 20 years are affected by hearing loss, subsequent in nearly 3.91 million years lived with disability (YLDs), and 46.9% of these cases occur as a complication of middle ear infections.¹⁹

In view of nasal diseases, current results verified that adenoiditis was the predominant cause of recurrent upper respiratory infections and nasal blockage followed by allergic rhinitis and sinusitis. Enlarged adenoids can cause complications such as middle ear disorders, facial skeletal mal-development, chronic mouth breathing, snoring, and, in severe cases, obstructive sleep apnea or irrevocable cor pulmonale.²⁰ Prevalence of adenoid hypertrophy is verified as 15.92% in an Indian study.²¹ One study from Bangladesh indicated prevalence of adenoid hypertrophy as 2.3%,²² while another one from same region recorded the prevalence of acute rhinitis as 8%, allergic rhinitis as 7.5%, epistaxis as 1.2%.¹⁶ In a Nigerian study, common pediatric nasal disorders are documented as viral rhinosinusitis (10.7%), adenoid hypertrophy (7.7%), allergic rhinitis (6.3%) and epistaxis as 0.5%.²³

The multinomial risk factor analysis conducted by the primary author concluded that children from slum areas had higher odds of nasal diseases than urban children (OR =2.014, $p < 0.001$), with the highest risk in 2-year-olds (OR =7.937, $p = 0.001$) and 6-year-olds (OR =6.807, $p = 0.002$). Males in slum areas were also more likely to develop ENT diseases than females (OR =1.402, $p = 0.003$). Mori et al. also found the statistically significant influence of sociodemographic factors on pediatrics ENT diseases, they documented in their study that ear disorders were most common in infants (95.11%), throat disorders in adolescents (25.20%), males had more ear and nose problems, females had more throat disorders, and lower socio-economic groups had the highest ENT disease burden (all p -values < 0.001).¹³ Comparing findings of this study with a study conducted in urban slums of Islamabad, it was stated that upper respiratory

tract illnesses were more prevalent among male children (62%), with the highest occurrence in 1–4 years (45.36%), followed by 0–1 years (41.9%), and the lowest in 4–5 years (12.96%).²⁴

Conclusion

Conclusively this study highlights a significant burden of pediatric ENT diseases. Unfavorable sociodemographic factors, such as passive smoking, low maternal literacy, and limited healthcare access, contribute to disease persistence and complications. Targeted community awareness programs and early medical interventions are crucial for reducing morbidity and improving children's quality of life. As this is a hospital-based, which may not fully capture cases managed at primary healthcare centers or those left untreated in the community. Additionally, as this was a retrospective analysis, follow-up of patients was not possible, limiting our ability to assess disease progression, treatment outcomes, and long-term complications.

Recommendations

Structured community programs, in collaboration with schools and healthcare systems, should be planned to raise awareness among teachers and parents about risk factors, preventive strategies, and early detection of common ENT diseases. This approach can help prevent comorbidities and lifelong complications. Ongoing data recording is crucial. Moreover, general pediatricians and interns should be adequately trained for timely referrals to specialist clinics.

Funding: None.

Availability of Data: The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethical Approval: The Ethical Review Committee of Rai Medical College, Sargodha approved the study via letter no. RMCS/ERC/09/24.

Conflict of Interest: None declared.

References

1. Dutta S, Haldar D, Aggarwal N, Panja T, Ghosh T, Sinha R. Pediatric otolaryngological emergency: An experience from a tertiary care teaching institution at Kolkata, India. *Indian J Otolaryngol Head Neck Surg* 2018; 70(4): 490-4.

2. Lin L, Zhao T, Qin D, Hua F, He H. The impact of mouth breathing on dentofacial development: A concise review. *Front. Public Health* 2022; 10: 929165.
3. Goulioumis AK, Gkorpa M, Athanasopoulos M, Athanasopoulos I, Gyftopoulos K. The eustachian tube dysfunction in children: anatomical considerations and current trends in invasive therapeutic approaches. *Cureus* 2022; 14(7): 27193.
4. Lukama L, Aldous C, Michelo C, Kalinda C. Ear, Nose and Throat (ENT) disease diagnostic error in low-resource health care: Observations from a hospital-based crosssectional study. *PLoS ONE* 2023; 18(2): e0281686.
5. Talha A, Tayyab M, Sardar T. Child Rights and Its Implementation Status in Pakistan. *JADS* 2023; 12(3): 512-24.
6. Rafi MT, Mehboob S, Aftab K, Saify ZS, Rehman U (2017) Prevalence and Possible Surgical Intervention of Ear, Nose and Throat Diseases in Local Population of Pakistan. *J Pharma Pharma Sci* 2017; 2(3): 137.
7. Zhang Y, Lan F, Zhang L. Advances and highlights in allergic rhinitis. *Allergy* 2021; 76(11): 3383-9.
8. Ali S, Ijaz M, Ghaffar A, Oneeb M, Masud A, Durrani AZ, et al. Species distribution and seasonal dynamics of equine tick infestation in two subtropical climate niches in Punjab, Pakistan. *Pak Vet J* 2020; 40(1): 25-30.
9. Sahin S, Bayindir T, Cingi C, Erdogmus N, Gurbuz M, Cakli H, et al. Epidemiologic variation in pediatric ear, nose, and throat diseases: pediatric emergency admissions in two different regions of Turkey. *Pediatr Sci J* 2013; 5: 1-7.
10. Briggs DC, Ikenga VO, Oparaodu UA, Mbak E. The pattern of paediatric otorhinolaryngological disorders seen at the Rivers State University Teaching Hospital, South-south Nigeria: a 3-year review. *Pan Afr Med J* 2022; 42(1): 94.
11. Mpengani T, Ngale M, Nkodila A, Lema G, Lumbu D, Lema G, et al. Epidemio-clinical profile and determinants of paediatric ENT pathologies in rural hospitals: Case of Kimpese Evangelical Medical Institute. *Int J Otorhinolaryngol* 2024; 10(1): 6-12.
12. Khanam A, Akhtar G, Hossain F, Chowdhury NN, Rahman MA. Pattern of Otolaryngological Diseases among Paediatric Population Attending ENT OPD in a Tertiary Care Centre, Dhaka. *Delta Med Coll J* 2017; 5(1): 30-4.
13. Mori HR, Kucha A, Patelia MT, Shah SA. Incidence of Ear, Nose and Throat Disorders in Children: A Prospective Observational Study from Tertiary Care Teaching Hospital in Gujarat. *Res J Med Sci* 2023; 17: 186-93.
14. Akram S, Khan MA, Rehman A, Malik KZ, Afridi JA. Comparison of prevalence of various ENT diseases and hearing impairment among children of government schools versus private schools of Mardan. *J Fatima Jinnah Med Univ* 2020; 14(4): 170-5.
15. Sumon MA, Ahmed SU, Afsana SD, Hasan MS, Islam MS, Rahman MM. Pattern of ENT Diseases in Children: A Peripheral Military Hospital Based Study. *Mymensingh Med J* 2024; 33(4): 1131-40.
16. Mill MK, Saikia A, Sarma M, Phookan J, Saikia NJ. Clinicoepidemiological Profile of Otorhinolaryngological Diseases among Patients Aged 5-15 Years-A Retrospective Study. *J Clin Diagn Res* 2022; 16(4): 1-3.
17. Bulut F, Cumbul A, Ballica B. Clinical Importance of Family History in Recurrent Chronic Tonsillitis Pediatric Patients: Mini-Review. *J Pediatr* 2020; 4(3): 1-5.
18. Verma RR, Konkimalla A, Thakar A, Sikka K, Singh AC, Khanna T. Prevalence of hearing loss in India. *National Med J Ind* 2021; 34(4): 216-22.
19. Guo Z, Ji W, Song P, Zhao J, Yan M, Zou X, Bai F, et al. Global, regional, and national burden of hearing loss in children and adolescents, 1990–2021: a systematic analysis from the Global Burden of Disease Study 2021. *BMC Public Health* 2024; 24(1): 2521.
20. Wang H. Chronic adenoiditis. *J Int Med Res.* 2020; 48(11): 0300060520971458.
21. Hardev R. Mori, Arvind Kucha, Mehul Tejabhai Patelia and Sanket A. Shah. Incidence of Ear, Nose and Throat Disorders in Children A Prospective Observational Study from Tertiary Care Teaching Hospital in Gujarat. *Res J Med Sci* 2023; 17: 186-93.
22. Halder AL, Biswas SS. Prevalence and clinical presentation of adenoid hypertrophy among children attending at pediatric outpatient department of a tertiary care general hospital of Dhaka. *Birdem Med J* 2025; 12(2): 111-6.
23. Eziyi JAE, Amusa YB, Nwawolo CC. The prevalence of nasal diseases in Nigerian school children. *J Med Med Sci* 2014; 5(4): 71-7.
24. Qureshi MA, Qureshi MA, Ismail MM, Aamir S, Khan RA, Rana M. Upper respiratory infections among under-five age group children at an urban slum, Islamabad. *Pak J Med Health Sci* 2025; 16(10): 693.