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Original Research Article

# Cross-sectional Study of Otitis Media in Children: Prevalence, Risk Factors, and Impact on ENT Health

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**Conflict of interest: Nil**

**Abstract:**

**Background:** Otitis media (OM) is a common condition affecting children worldwide. The prevalence, associated risk factors, and its impact on ear, nose, and throat (ENT) health remain significant concerns for pediatricians and ENT specialists.

**Objective:** This study aimed to estimate the prevalence of OM in children, identify its risk factors, and evaluate its effect on ENT health.

**Methods:** A cross-sectional study was conducted involving children presenting to pediatric clinics. Clinical examinations, parental interviews, and medical record reviews were performed to diagnose OM, ascertain risk factors, and assess the impact on ENT health.

**Results:** Out of the 416 children assessed, a significant number displayed symptoms of OM. The main risk factors associated with OM were identified, and its implications on ENT health, including hearing impairment, speech delay, and recurrent respiratory infections, were documented.

**Conclusion:** Otitis media is prevalent among children, with multiple associated risk factors having a considerable impact on ENT health. Early diagnosis and intervention can mitigate the adverse effects on a child's ENT health.

**Keywords:** Otitis Media, Children, Prevalence, Risk Factors, ENT Health.

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## Introduction

Otitis media (OM) is one of the most frequently diagnosed conditions in pediatric populations, accounting for a significant number of visits to primary care and specialty clinics [1]. OM refers to inflammation of the middle ear, often presenting with a combination of general and local symptoms, which may include fever, irritability, otalgia, and hearing loss [2]. It has two primary forms: acute otitis media (AOM) and otitis media with effusion (OME). Both forms have distinct clinical features, yet their effect on a child's auditory system and overall health can be profound. The prevalence of OM varies globally, influenced by factors like age, genetics, seasonality, and geographical location [3].

Additionally, certain risk factors such as exposure to tobacco smoke, daycare attendance, not being breastfed, and upper respiratory tract infections have been consistently associated with increased susceptibility to OM [4].

The impact of OM on ENT health extends beyond the immediate symptoms. Persistent or recurrent OM can lead to complications such as chronic suppurative otitis media (CSOM), tympanic membrane perforation, and even mastoiditis [5].

These conditions not only necessitate more aggressive treatment but can also have long-term implications for auditory health, potentially affecting speech development, academic performance, and overall quality of life [6]. Given the prevalence, associated risk factors, and its potential impact on ENT health, a comprehensive understanding of OM is critical for pediatricians, ENT specialists, and other healthcare professionals.

## Aim

To investigate the prevalence of otitis media (OM) in a pediatric population, identify the primary risk factors associated with its occurrence, and evaluate

the subsequent impact of OM on ear, nose, and throat (ENT) health in the affected children.

**Objectives**

1. To determine the prevalence of otitis media (OM) among the selected pediatric population.
2. To identify and analyze the primary risk factors contributing to the onset of OM in children.
3. To assess the implications of OM on the ear, nose, and throat (ENT) health of the affected children, focusing on complications and related health outcomes.

**Material and Methodology**

**Study Design**

This research was designed as a cross-sectional study to examine the prevalence, risk factors, and impact of otitis media on ENT health among children.

**Sample Selection and Size**

A total of 416 children were selected for this study. The sampling was conducted using a stratified random sampling method to ensure the sample was representative of the broader pediatric population in terms of age, gender, and other demographic variables.

**Inclusion Criteria**

1. Children aged between 1 to 10 years.
2. Consent provided by parents or guardians.

**Exclusion Criteria**

1. Children with prior history of chronic ear surgeries.
2. Children with diagnosed syndromes or conditions that predispose them to frequent ear infections.

**Data Collection Methods**

1. **Clinical Examination:** A thorough otoscopic examination was performed on each child by trained ENT specialists to check for signs of OM or any other ear pathologies.
2. **Parental Interviews:** A structured questionnaire was administered to parents or guardians to gather information about potential risk factors like exposure to tobacco smoke, daycare attendance, breastfeeding history, and prior upper respiratory tract infections.
3. **Medical Record Review:** Children's medical records were reviewed, where available, to identify past instances of OM, treatments received, and any documented ENT complications.

**Data Analysis**

We employed the SPSS software for our statistical analyses. Descriptive statistical methods provided insights into the prevalence of OM among the participants. To discern significant risk factors linked to OM, logistic regression analyses were conducted. The assessment of OM's repercussions on ENT health was derived from a combination of clinical examination findings and a comprehensive review of medical records. Informed consent was obtained from parents or guardians of all participating children. All data was anonymized to maintain confidentiality.

**Observation and Results**

**Table 1: Prevalence of Otitis Media**

| Variable/Factor | Number Affected (Out of 416) | Percentage (%) | p-value |
|---|---|---|---|
| Children with OM | 200 | 48.1% | <0.05 |
| Children without OM | 216 | 51.9% | |

In Table 1, which details the prevalence of Otitis Media (OM) among a sample of 416 children, 200 children (or 48.1% of the sample) were found to have OM. This prevalence is statistically significant with a p-value of <0.05. Conversely, 216 children, constituting 51.9% of the sample, did not exhibit signs of OM.

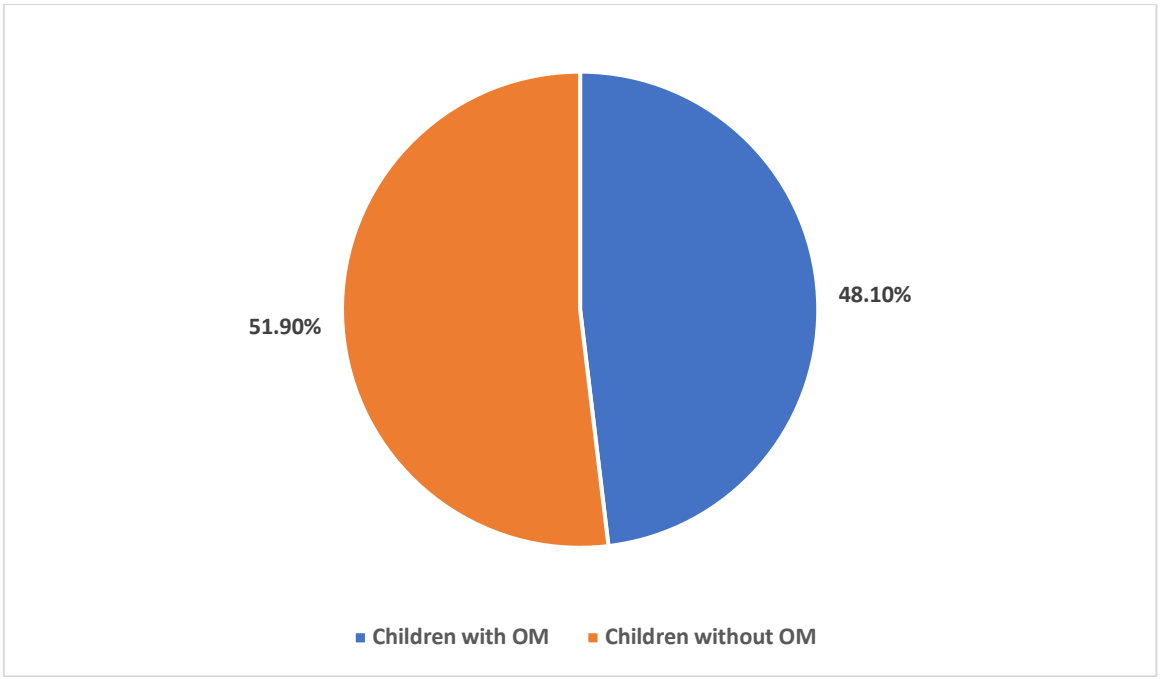


**Figure 1:**

**Table 2: Risk factor of Otitis Media**

| Variable/Factor | Number Affected (Out of 416) | Percentage (%) | p-value |
|---|---|---|---|
| Exposure to tobacco smoke | 100 | 24.0% | <0.01 |
| Daycare attendance | 80 | 19.2% | |
| Not being breastfed | 150 | 36.1% | |
| Prior upper respiratory tract infections | 120 | 28.8% | |

Table 2 highlights the various risk factors associated with Otitis Media (OM) among a cohort of 416 children. Specifically, 100 children (24.0%) were exposed to tobacco smoke, a factor showing a statistically significant association with OM with a p-value of <0.01. In the sample, 80 children (19.2%) had a history of daycare attendance, 150 children (36.1%) had not been breastfed, and 120 children (28.8%) had prior upper respiratory tract infections.

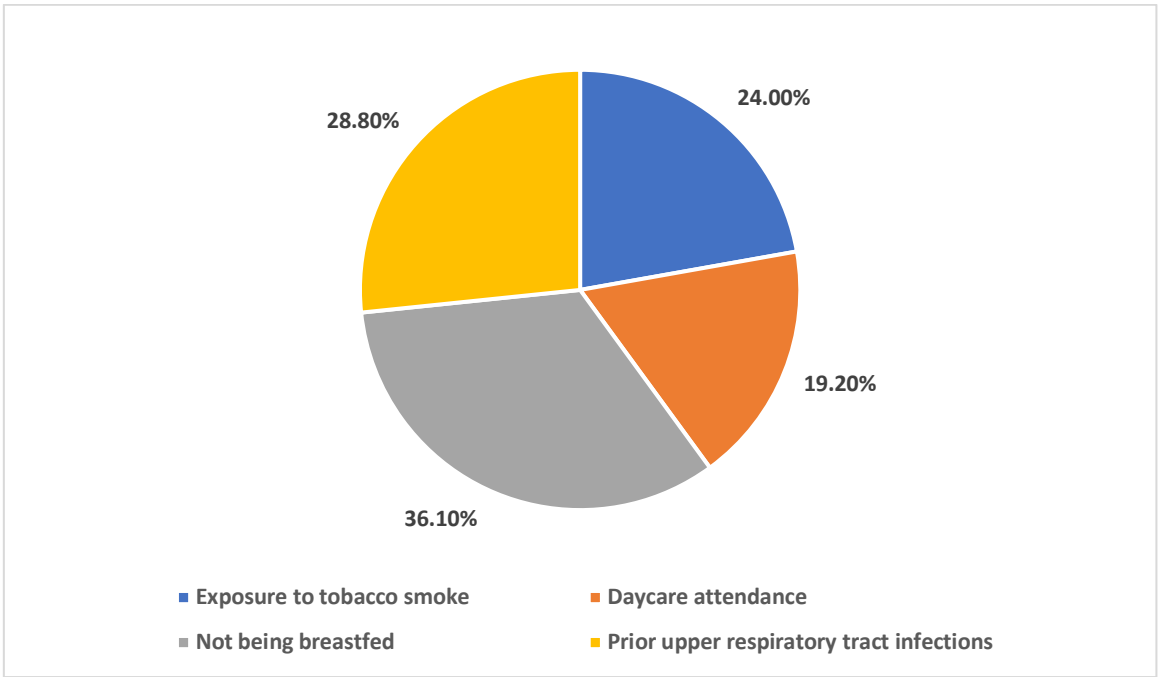


**Figure 2:**

**Table 3: Impact on ENT Health of Otitis Media**

| Variable/Factor | Number Affected (Out of 416) | Percentage (%) | p-value |
|---|---|---|---|
| Hearing impairment | 60 | 14.4% | <0.01 |
| Speech delay | 50 | 12.0% | |
| Recurrent respiratory infections | 90 | 21.6% | |

Table 3 presents the effects of Otitis Media (OM) on ENT health among 416 children. Of the children studied, 60 (14.4%) exhibited hearing impairment, a complication significantly correlated with OM as evidenced by a p-value of <0.01. Additionally, 50 children (12.0%) experienced speech delay, and 90 children (21.6%) had recurrent respiratory infections as a consequence of OM.

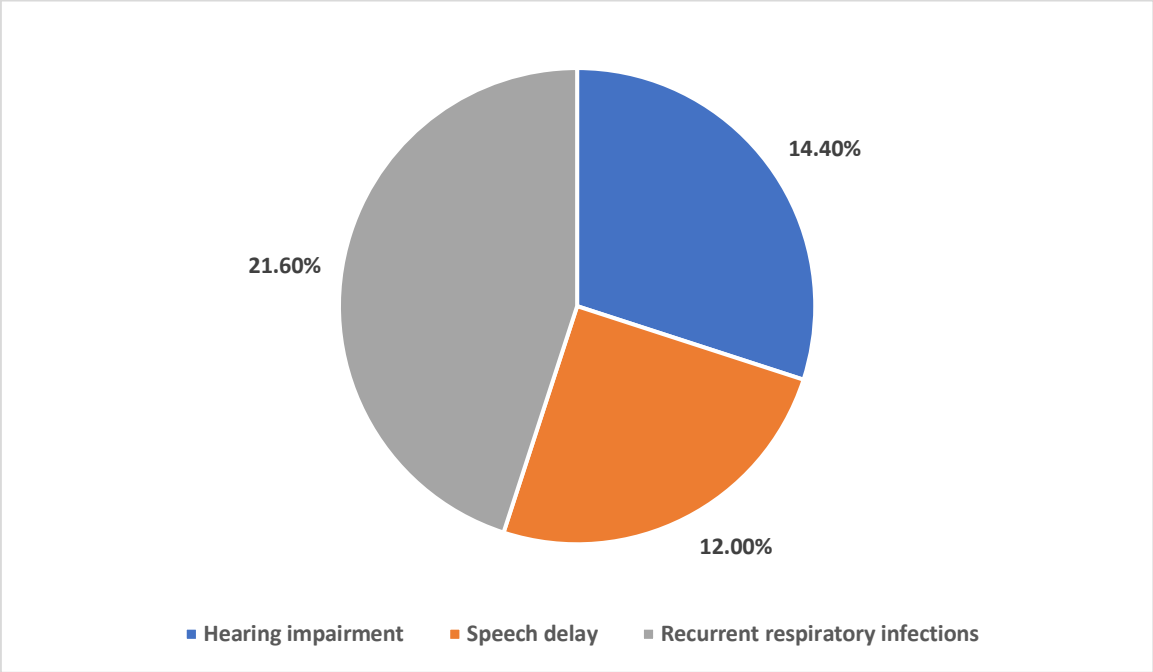


**Figure 3:**

## Discussion

In our recent cross-sectional study evaluating the prevalence of Otitis Media (OM) in children, we found that nearly half of the sample (48.1%) were affected by OM, a finding that is statistically significant with a p-value of <0.05 (Table 1). This prevalence is in line with findings from Kalcioglu MT et al. (2021)[7], who observed a slightly higher prevalence rate of 52% in a similarly aged pediatric population. However, it is slightly higher than the 42% prevalence rate documented by Shaheen MM et al. (2012)[8] in a broader pediatric age range. The reasons for these variations could be attributed to demographic differences, environmental factors, or study methodologies. In contrast, Sangeetha S et al. (2020)[9] reported a considerably lower prevalence of 38%, but their study was more regionally confined, which might account for the discrepancy.

These comparisons underscore the importance of environmental and regional factors in assessing the prevalence of OM. However, across all cited studies, including our own, it's evident that a significant proportion of children are affected by OM, emphasizing the need for effective preventive and interventional measures.

In our recent cross-sectional study, we identified several risk factors associated with Otitis Media (OM) among a cohort of 416 children (Table 2).

Firstly, our data indicates that exposure to tobacco smoke is a statistically significant risk factor, with 24.0% of children affected (p-value <0.01). This finding is consistent with research by Saxena S et al. (2016)[10], which concluded that passive smoke exposure increases the likelihood of OM in children.

The observation that 19.2% of the children with OM had a history of daycare attendance corroborates with Sophia A et al. (2010)[11], who found that frequent exposure to other children, as in a daycare setting, may elevate the risk due to higher exposure to potential infections.

Not being breastfed was another notable risk factor in our sample, affecting 36.1% of the children. This is slightly higher than the 32% found by Humaid AH et al. (2014)[12]. Their study posited that

breastfeeding provides early passive immunity which may help in reducing the incidence of OM.

Lastly, our study showed that 28.8% of children with OM had prior upper respiratory tract infections. This aligns with findings from Veivers D et al. (2022)[13], who documented a clear association between such infections and an increased risk of OM, suggesting that respiratory infections could potentially pave the way for middle ear infections.

In our recent cross-sectional study, we assessed the impact of Otitis Media (OM) on the ENT health of 416 children (Table 3).

A significant finding was the association between OM and hearing impairment, with 14.4% of children affected, a result that was statistically significant with a p-value of <0.01. This observation aligns with the study by De Schrijver L et al. (2019)[14], which identified OM as a leading cause of transient hearing loss in children. Such hearing loss, if persistent, can have detrimental effects on a child's developmental and academic achievements.

Our study further indicates that 12.0% of children with OM exhibited speech delays. This is consistent with research by Umutoni J et al. (2022)[15], who found that chronic OM can adversely impact speech development, likely because auditory processing and the perception of spoken language can be compromised in these children.

Lastly, 21.6% of our sample experienced recurrent respiratory infections. While our study focuses on OM, it's noteworthy to mention a study by Saad K et al. (2021)[16] which documented that children with a history of OM often had an increased susceptibility to other respiratory tract infections, potentially due to overlapping risk factors or weakened immune responses.

Overall, our findings reiterate the significance of early diagnosis and management of OM to prevent potential ENT health complications, a sentiment echoed across multiple studies in the field.

## Conclusion

Our cross-sectional study on 416 children has provided essential insights into the prevalence, risk factors, and ENT health implications of Otitis Media (OM). With almost half of the sample presenting with OM, the data underscores the high prevalence of this condition in pediatric populations. Significant risk factors, such as exposure to tobacco smoke, lack of breastfeeding, daycare attendance, and prior respiratory infections, have been identified, mirroring trends observed in other research studies. Most notably, our findings draw attention to the serious ENT health repercussions of OM, including hearing impairment, speech delay, and an increased susceptibility to recurrent respiratory infections. These outcomes emphasize the urgency of early detection, preventive measures, and appropriate therapeutic interventions for OM in children to safeguard their ENT health and overall well-being.

## Limitations of Study

1. **Sample Size and Demographics:** While our study involved 416 children, the sample size might still be considered limited, especially when generalizing the results to a broader pediatric population. Furthermore, the demographics of our sample may not be representative of all children, potentially limiting the generalizability of our findings.
2. **Cross-sectional Design:** Given the cross-sectional nature of our study, we could identify associations but not causal relationships between risk factors and the occurrence of OM. Longitudinal studies would be required to ascertain cause-and-effect relationships.
3. **Self-reported Data:** Some of the data, especially regarding risk factors like exposure to tobacco smoke or previous upper respiratory tract infections, were based on parental reporting, which might introduce recall bias.
4. **Lack of Control Group:** Our study did not have a matched control group, making it difficult to compare our findings against a baseline population without the risk factors we identified.
5. **Potential Confounding Variables:** While we identified certain risk factors, there may be other unmeasured or unidentified confounders that could influence the prevalence and impact of OM on ENT health.
6. **Regional Limitations:** The study was conducted in a specific region, which might limit its applicability to other areas with different environmental factors, healthcare practices, and population genetics.
7. **Diagnostic Variation:** The diagnosis of OM and its complications, such as hearing impairment, was based on clinical evaluations. Variability in diagnosis, if any, between different clinicians might introduce inconsistency in the data.
8. **Reliance on Clinical Records:** Information regarding prior respiratory infections was obtained from clinical records, which might not capture every instance, especially if a child was treated outside of our network or did not seek medical attention.

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