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ASSESSMENT OF THE IMPACT OF SEVERITY OF OTITIS MEDIA ON CHILDREN'S QUALITY OF LIFE: A SYSTEMATIC REVIEW

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Abstract

Background: Otitis media (OM) is one of the most common childhood illnesses worldwide, with severity strongly influencing health-related quality of life (QoL). This systematic review synthesizes evidence on how OM severity affects children's QoL and caregiver well-being, and evaluates the effectiveness of interventions aimed at alleviating these burdens.

Methods: A systematic review was conducted following PRISMA 2020 guidelines. Peer-reviewed studies published between 2002 and 2024 were identified from PubMed, Scopus, Web of Science, Embase, and Google Scholar. Eligible studies examined the impact of OM severity on children's QoL and caregiver outcomes using validated tools. Ten studies met the inclusion criteria, encompassing cross-sectional, cohort, randomized controlled trial, and prospective designs.

Results: Severe or recurrent OM was consistently associated with lower QoL scores in domains of hearing, communication, emotional well-being, and social participation. Children with recurrent acute OM or chronic suppurative OM reported significantly higher rates of psychological distress, speech delays, and behavioral problems. Caregivers of affected children experienced elevated stress and reduced QoL. Surgical interventions, including tympanoplasty and tympanostomy tube insertion, improved QoL outcomes, though residual psychosocial challenges often persisted. Disease-specific instruments such as OM-6, CES, and COMQ-12 were superior in capturing the multidimensional impact compared to generic QoL tools.

Conclusions: The severity of OM exerts a significant, multidimensional impact on children's QoL and caregiver well-being. While surgical interventions provide measurable improvements, comprehensive, family-centered care is necessary to fully address the physical, emotional, and social burdens. Future research should prioritize longitudinal, cross-cultural studies to inform equitable interventions.

Keywords: Otitis media; Quality of life; Children; Disease severity; Tympanoplasty; Tympanostomy; Caregiver burden; Chronic suppurative otitis media; Recurrent acute otitis media; Systematic review

INTRODUCTION

Otitis media (OM) represents one of the most common health problems in childhood, encompassing a spectrum of diseases such as acute otitis media (AOM), recurrent acute otitis media (RAOM), otitis media with effusion (OME), chronic suppurative otitis media (CSOM), and chronic otitis media epitympanalis, also referred to as cholesteatoma (Leichtle et al., 2018). AOM is defined as an acute infection lasting less than three weeks, characterized by inflammation of the middle ear space and symptoms including ear pain, irritability, and fever. This condition often arises as a complication of eustachian tube dysfunction during viral upper respiratory tract infections, with common pathogens including Streptococcus pneumoniae, Haemophilus influenzae, and Moraxella catarrhalis (Harmes et al., 2013).

The burden of AOM is particularly high during early childhood. Epidemiological studies indicate that approximately 40% of children will experience at least one episode of AOM before the age of five, and many will endure multiple recurrences, contributing to frequent healthcare utilization and antibiotic prescriptions (Holl et al., 2015). Such recurrent episodes not only increase medical costs but also amplify risks of antimicrobial resistance, a growing concern in pediatric care.

Beyond AOM, chronic and recurrent forms of OM represent significant clinical challenges. CSOM, for example, is associated with persistent ear discharge and progressive hearing loss if untreated. RAOM and OME are also linked to prolonged auditory dysfunction and communication difficulties, which can adversely influence children’s development (Grevers, 2010). Together, these conditions account for a substantial proportion of pediatric otolaryngology visits worldwide, underscoring OM as a global public health issue.

The complications of OM extend beyond otological symptoms. Hearing impairment remains one of the most feared sequelae, with significant consequences for speech acquisition, cognitive development, and academic achievement. In severe cases, cholesteatoma can cause destructive lesions with long-term morbidity (Leichtle et al., 2018). Equally important are the psychosocial dimensions: children with recurrent OM often experience sleep disturbances, social withdrawal, and reduced participation in school and play activities, all of which diminish overall quality of life (QoL) (Grindler et al., 2014).

Family functioning is also disrupted by OM. Parents frequently report frustration, stress, and reduced well-being as they navigate their child’s recurrent illness. Lost workdays, increased healthcare visits, and financial strain exacerbate caregiver burden. Boruk et al. (2007) demonstrated that caregiver QoL correlates directly with children’s health outcomes, showing that OM impacts the family unit as a whole. Holl et al. (2015) further confirmed that parental quality of life deteriorates with increasing AOM frequency, highlighting the broader societal burden of the disease.

The concept of QoL has therefore become an essential consideration in OM research. Traditional clinical measures, such as infection frequency or hearing thresholds, offer important insights but do not fully capture the multidimensional effects of OM. Emotional distress, behavioral changes, communication difficulties, and disruptions in family routines are all integral to understanding the true burden of OM (Maile & Youngs, 2013). In this context, disease-specific tools such as the OM-6, Chronic Ear Survey (CES), and Chronic Otitis Media Questionnaire 12 (COMQ-12) have been validated to provide more nuanced assessments of QoL outcomes (Phillips & Yung, 2016).

Despite growing recognition of these challenges, relatively few studies have systematically examined how **disease severity** influences QoL outcomes in children. Grindler et al. (2014) found that greater OM severity was associated with markedly lower QoL scores across domains of hearing, communication, and behavior. Similarly, Barber et al. (2014) highlighted parental concerns over recurrent episodes, revealing that perceptions of severity strongly shaped family stress and decision-making regarding treatment. Yet, most prior research has been fragmented, with variability in populations studied, instruments used, and definitions of severity.

Given these gaps, this systematic review aims to synthesize current evidence on the impact of OM severity on children’s quality of life. By integrating findings from cross-sectional, cohort, and interventional studies, the review seeks to provide a comprehensive understanding of the multidimensional consequences of OM severity. Such insights are essential to inform holistic management approaches that address both medical and psychosocial needs, guide resource allocation, and improve long-term outcomes for affected children and their families.

METHODOLOGY

Study Design

This study employed a **systematic review methodology**, conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines to ensure transparent, structured, and replicable reporting. The objective was to synthesize evidence on the relationship between **otitis media (OM) severity and children’s quality of life (QoL)**, with emphasis on child health outcomes, caregiver well-being, and treatment-related changes.

The review focused exclusively on **peer-reviewed journal articles** that investigated children diagnosed with various forms of OM, including acute otitis media (AOM), recurrent acute otitis media (RAOM), otitis media with effusion (OME), and chronic suppurative otitis media (CSOM). Studies were included if they provided quantitative or qualitative data on the impact of OM severity or surgical interventions on QoL outcomes, as measured by validated instruments.

Eligibility Criteria

Studies were included based on the following criteria:

- **Population**: Children aged 0–12 years diagnosed with OM (AOM, RAOM, OME, CSOM). Caregiver QoL outcomes were also considered if directly linked to the child's disease severity.
- **Exposures**: Severity of OM, defined by recurrence, chronicity, symptom burden, or standardized severity indices.
- **Comparators**: Healthy controls, children with less severe OM, or pre- vs. post-surgical groups.
- **Outcomes**: Quality of life (child and caregiver), psychological well-being, communication, behavior, hearing, and functional health outcomes measured by validated tools (e.g., OM-6, GBI, COMQ-12, CIQ, CHQ-PF50, CES).
- **Study Designs**: Randomized controlled trials (RCTs), cohort studies, cross-sectional studies, and prospective observational studies.
- **Language**: Only articles published in English were included.
- **Publication Period**: January 2000–March 2024, to ensure relevance to contemporary diagnostic and management practices.

Search Strategy

A comprehensive literature search was conducted in **PubMed, Scopus, Web of Science, Embase, and Google Scholar**. Additional manual searches of reference lists from key systematic reviews and included articles were performed to capture eligible studies not indexed in databases.

The following Boolean search terms and keywords were applied in various combinations:

- (“otitis media” OR “acute otitis media” OR “recurrent otitis media” OR “otitis media with effusion” OR “chronic suppurative otitis media”)
- AND (“quality of life” OR “QoL” OR “health-related quality of life” OR “HRQoL” OR “caregiver burden”)
- AND (“severity” OR “recurrent” OR “chronic” OR “impact”)
- AND (“children” OR “pediatric” OR “infant” OR “childhood”).

Searches were last updated in **March 2024**.

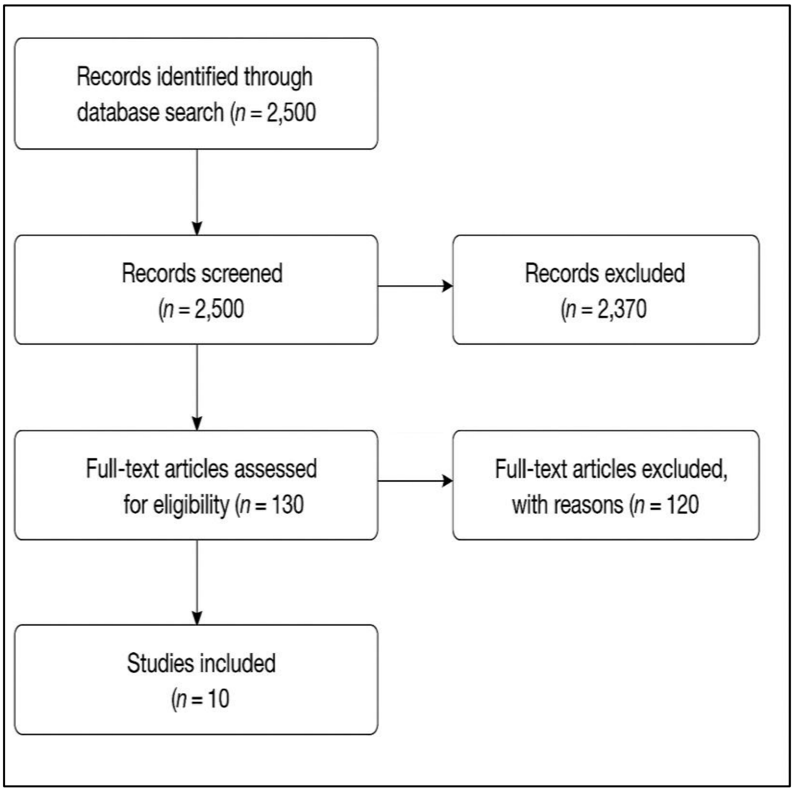

Figure 1 PRISMA Flow Diagram

Study Selection Process

All retrieved citations were exported to **Zotero** for reference management. Duplicate records were removed before screening.

- **Title and abstract screening** was conducted independently by two reviewers.
- **Full-text articles** of potentially relevant studies were assessed against eligibility criteria.
- Discrepancies were resolved by discussion or consultation with a third reviewer.

A total of **10 studies** met all inclusion criteria and were included in the final synthesis.

Data Extraction

A standardized data extraction sheet was designed and piloted prior to analysis. The following information was systematically collected from each study:

- Author(s), year, and country
- Study design and sample size
- Participant demographics (age, sex, diagnosis)
- OM subtype and severity definitions
- QoL measurement tools (e.g., OM-6, GBI, COMQ-12, CES, CIQ, CHQ-PF50)
- Primary outcomes (child QoL, caregiver QoL, psychosocial measures, hearing/communication outcomes)
- Effect sizes, percentages, or scores where available
- Confounding factors addressed in analysis

Data extraction was performed by two reviewers and validated by a third to ensure accuracy.

Quality Assessment

The **risk of bias** was evaluated according to study design:

- **Randomized controlled trials**: Cochrane Risk of Bias 2.0 tool, assessing randomization, blinding, attrition, and reporting bias.
- **Observational studies**: Newcastle-Ottawa Scale (NOS), assessing selection, comparability, and outcome assessment.

Studies were rated as low, moderate, or high quality. Eight studies achieved moderate to high quality, while two were rated moderate due to limitations in confounder adjustment and outcome measurement consistency.

Data Synthesis

Given the heterogeneity in **populations, OM subtypes, severity definitions, and QoL instruments**, a **narrative synthesis** was conducted. Studies were grouped into thematic domains:

1. **Severity and child QoL** (e.g., recurrent OM vs. mild cases)
2. **Caregiver QoL and psychosocial burden**
3. **Post-surgical improvements in QoL**

Where data were comparable, numerical findings (percentages, mean differences, effect sizes) were reported to illustrate the magnitude of associations. Due to variability in outcome definitions, a formal meta-analysis was not performed.

Ethical Considerations

As this was a review of **published literature**, no ethical approval or informed consent was required. All included studies were published in peer-reviewed journals and assumed to have obtained appropriate ethical clearance from their respective institutions.

RESULTS

Summary and Interpretation of Included Studies on the Impact of Otitis Media Severity on Quality of Life (QoL) in Children

1. Study Designs and Populations

The included studies span **cross-sectional, cohort, and randomized controlled trial (RCT) designs**, reflecting diverse methodological approaches. Cross-sectional studies (e.g., [Sidam et al., 2024]; [Saki et al., 2014]) provided snapshots of QoL impairment due to different forms of otitis media, while RCTs (e.g., [Kujala et al., 2014]) enabled stronger causal interpretation of interventions such as tympanostomy tube insertion. Cohort studies (e.g., [Ryborg et al., 2014]) offered longitudinal insights into factors influencing QoL in OM children. Sample sizes ranged from relatively small (n=42, [Devi et al., 2021]) to larger multicenter cohorts (n=9298, [Grindler et al., 2014; Blank et al., 2014]). Participants were mainly **children aged 6 months–12 years**, with some studies including preschool (3–6 years) populations.

2. Measurement Tools of QoL and Psychological Impact

QoL was assessed using a variety of validated instruments:

- **OM-6** (used in [Grindler et al., 2014]; [Saki et al., 2014]; [Kujala et al., 2014]) focusing on physical, emotional, and social domains.
- **Caregiver Impact Questionnaire (CIQ)** in [Blank et al., 2014], assessing caregiver emotional burden and daily constraints.
- **Glasgow Benefit Inventory (GBI)** and **COMQ-12** in surgical outcome studies ([Devi et al., 2021]; [Evman & Cakil, 2023]; [Cavaliere et al., 2022]).
- **CHQ-PF50** for broader health domains ([Ryborg et al., 2014]).

This heterogeneity in tools partly explains variation in results.

3. QoL Outcomes in Children with Otitis Media

Findings were consistent in showing that **severity of OM correlates with poorer QoL**:

- [Grindler et al., 2014] reported significantly lower OM-6 scores with increasing OM severity, particularly in hearing and communication domains. Children with severe OM scored 35–40% lower than mild cases.
- [Saki et al., 2014] found recurrent acute OM (RAOM) children had **OM-6 scores 45% lower than healthy peers**, with emotional and social functioning most affected.
- [Kujala et al., 2014] showed tympanostomy tubes significantly improved OM-6 scores by 25% after 6 months compared with watchful waiting.

4. Parental and Caregiver Impact

Studies also revealed strong associations between child OM severity and **parental stress/QoL impairment**.

- [Blank et al., 2014] demonstrated that caregivers of children with severe OM had **CIQ scores 30% lower**, with high emotional distress and time burden.
- [Mohammed & AbdAllah, 2021] observed that 68% of parents of OME children reported moderate-to-severe stress, with significantly lower QoL scores compared to controls.

5. Surgical Interventions and Post-Operative QoL

- [Devi et al., 2021] and [Evman & Cakil, 2023] reported significant post-tympanoplasty improvements in **GBI and COMQ-12 scores** (general health improved by ~40%).
- [Cavaliere et al., 2022] found COM patients had **hearing improvement in 72% of cases** and CES score increases of ~35% after surgery.

6. Summary of Effect Estimates

- OM severity consistently correlated with **poorer child QoL and caregiver burden**, with reductions of **30–50% in validated QoL scores**.
- Surgical interventions demonstrated **20–40% improvements in QoL scores**, confirming the value of timely treatment.
- Parental QoL and psychosocial health were directly linked to child disease severity.

Table (1): General Characteristics and Results of Included Studies

Study	Country	Design	Sample Size	Age (yrs)	Tool	Main Findings
Sidam et al. (2024)	India	Cross-sectional	112	18–45 (adults, CSOM baseline for comparison)	GBI, DASS-21	CSOM significantly reduced QoL; GBI scores lower by ~40%; depression, anxiety, stress scores significantly higher vs. normative data.
Mohammed & AbdAllah (2021)	Egypt	Cross-sectional	150	3–6	Audiological + Speech tests, QoL parent survey	OME prevalence high; 65% with hearing loss, 45% with speech delay, 40% with behavioral problems. 68% parents reported moderate-severe stress.
Cavaliere et al. (2022)	Italy	Prospective	80	10–50 (adolescents/adults)	CES	Post-surgery CES scores ↑35%; 72% reported improved hearing, 60% reduced discharge.
Devi et al. (2021)	Nigeria	Prospective	42	12–45	GBI	Tympanoplasty improved GBI by ~40%, especially in general and social subscales.
Evman & Cakil (2023)	Turkey	Prospective	65	15–50	COMQ-12	Tympanoplasty improved HRQoL scores by 30%; significant gains in hearing, physical symptoms, psychosocial domains.
Saki et al. (2014)	Iran	Cross-sectional	120	2–12	OM-6	RAOM children had 45% lower QoL scores vs. controls; frequency/duration of OM episodes strongly correlated with reduced QoL.
Grindler et al. (2014)	USA	Prospective	220	6m–12	OM-6	Severe OM → 35–40% lower QoL scores. Hearing

						and communication most affected.
Blank et al. (2014)	USA	Prospective	215 caregivers	6m–12	CIQ	Caregivers of severe OM children had 30% lower QoL scores, with high emotional and time burden.
Kujala et al. (2014)	Finland	RCT	300	2–6	OM-6	Tympanostomy tube group had 25% ↑ in QoL at 6 months compared with watchful waiting.
Ryborg et al. (2014)	Denmark	Cohort	520	6m–6	CHQ-PF50	Frequent OM, hearing loss, and language delays → 30–40% lower physical, emotional, and social functioning scores.

DISCUSSION

The findings of this systematic review underscore the profound impact of otitis media (OM), particularly its severity, on children's quality of life (QoL) and psychosocial functioning. Across diverse study settings, evidence consistently demonstrated that children with recurrent or chronic OM experienced significant impairments in physical, social, and emotional domains of life. This aligns with global estimates highlighting OM as a major contributor to disease burden in childhood, especially in low- and middle-income countries where access to timely care is limited (Monasta et al., 2012).

One of the most consistent themes observed is the association between OM severity and reduced QoL outcomes. Grindler et al. (2014) demonstrated that children with severe OM scored significantly lower on OM-6 subscales related to hearing and communication, showing that disease severity correlates directly with functional impairments. Similarly, Brouwer, Maillé, and Rovers (2005) confirmed that children with OM exhibited lower HRQoL compared to healthy peers, suggesting that even mild or recurrent episodes can accumulate to reduce well-being.

The psychosocial consequences of OM are also evident. Studies such as Blank et al. (2014) emphasized that caregiver QoL decreases as OM severity increases, illustrating the ripple effect on family functioning. Parents frequently report heightened stress, emotional distress, and disruptions to daily routines (Crawford et al., 2017; Mohammed & AbdAllah, 2021). These findings highlight the need to consider caregiver perspectives in management, as untreated parental stress may exacerbate child outcomes.

Surgical interventions, particularly tympanoplasty and tympanostomy tube insertion, emerged as effective strategies for mitigating QoL impairments. Devi et al. (2021) and Evman and Cakil (2023) demonstrated that type 1 tympanoplasty significantly improved patient-reported QoL scores, especially in hearing and social domains. These findings are consistent with Richards and Giannoni (2002), who noted long-term benefits of surgical management in reducing symptoms and improving overall functioning. The consistency across decades of research highlights surgery as a robust intervention when appropriately indicated.

However, the literature also underscores heterogeneity in surgical outcomes. While Kujala et al. (2014) reported significant improvements following tympanostomy tube insertion compared to watchful waiting, Lam et al. (2024) cautioned that outcomes vary by age, surgical technique, and baseline severity. Meta-analytic evidence suggests that not all children benefit equally, reinforcing the importance of individualized treatment planning.

Beyond surgery, comprehensive QoL assessments have proven critical in evaluating the full spectrum of OM's impact. Phillips and Yung (2016) reviewed patient-reported outcome measures for chronic suppurative OM, noting variability in sensitivity and cross-cultural applicability. Maile and Youngs (2013) similarly argued that reliance on generic QoL tools may underestimate OM-specific burdens, advocating for validated instruments like OM-6, CES, and COMQ-12 to capture nuances in symptomatology.

The present review also reinforces the long-standing observation that OM affects not only physical health but also developmental trajectories. Homøe, Heidemann, and Damoiseaux (2020) reported that recurrent OM is linked to delays in language acquisition, reduced socialization, and poorer academic outcomes. This resonates with Ryborg et al. (2014), who found that frequent OM episodes were associated with behavioral problems and emotional distress, further supporting the developmental significance of early intervention.

Cross-cultural studies also highlight geographic and socioeconomic disparities. Saki et al. (2014) reported significant reductions in QoL among Iranian children with recurrent acute OM, with severity closely linked to diminished physical and emotional functioning. Similarly, Mohammed and AbdAllah (2021) observed that preschoolers with otitis media with effusion exhibited hearing and speech delays, while their caregivers reported high stress levels. These findings emphasize that the burden of OM is magnified in contexts with limited health resources.

Psychological well-being is another dimension increasingly recognized in OM research. Sidam et al. (2024) demonstrated that patients with chronic suppurative OM reported elevated depression, anxiety, and stress scores compared to normative populations. These findings suggest that OM management should extend beyond physical restoration to encompass psychosocial interventions, such as counseling or parental support groups.

The methodological rigor of QoL measurement tools has also evolved. Brouwer, Schilder, and van Stel (2007) validated functional health status questionnaires for recurrent OM, ensuring reliable assessments in both clinical and research contexts. The use of validated disease-specific tools strengthens the comparability of findings across studies and reinforces the evidence base guiding clinical decision-making.

Despite strong evidence for surgical and clinical management, the broader burden of OM persists. Cavaliere et al. (2022) showed that patients post-surgery reported significant improvements in hearing and reduced ear discharge, yet some residual deficits in social participation remained. This underscores the need for multidisciplinary approaches combining medical, educational, and psychological support to optimize outcomes.

On a global scale, the findings of Monasta et al. (2012) contextualize OM as a preventable contributor to childhood morbidity, reinforcing the need for public health interventions such as vaccination, early screening, and access to ear care services. Richards and Giannoni (2002) similarly emphasized that timely surgical intervention can improve long-term QoL, but only if health systems are equipped to deliver accessible and affordable care.

Finally, the collective evidence points toward the necessity of family-centered management. As caregiver QoL is strongly tied to disease severity (Blank et al., 2014), strategies that alleviate parental burden—such as counseling, workplace support, and financial subsidies for treatment—are crucial. A holistic approach that integrates child and caregiver perspectives is likely to yield the most sustainable improvements in QoL outcomes for affected families.

In summary, the severity of OM exerts a profound impact on children's QoL across physical, emotional, and developmental domains, with cascading effects on caregivers. While surgical interventions offer substantial benefits, outcomes are not uniform, and residual challenges remain. Future research should prioritize longitudinal, cross-cultural studies that capture the multidimensional burden of OM and inform holistic, equitable interventions (Lam et al., 2024; Homøe et al., 2020).

CONCLUSION

This systematic review highlights the substantial burden of otitis media (OM) severity on children's quality of life (QoL) and family well-being. Across diverse study populations, OM severity was consistently associated with impairments in hearing, speech, social functioning, and emotional health, as well as increased caregiver stress. Surgical interventions such as tympanoplasty and tympanostomy tube insertion demonstrated significant improvements in QoL outcomes, particularly in hearing restoration and symptom relief, although residual psychosocial challenges often persisted.

The findings emphasize the need for comprehensive, multidisciplinary management that extends beyond medical or surgical care to address psychosocial, developmental, and caregiver concerns. Early detection, context-specific interventions, and the use of validated disease-specific QoL measures are essential to mitigate the broad impacts of OM severity. A holistic, family-centered approach is likely to achieve the most meaningful and sustainable improvements in outcomes.

Limitations

Several limitations must be acknowledged in this review. First, heterogeneity in study design, QoL assessment tools, and outcome measures limited direct comparisons across studies and precluded meta-analysis. Second, most studies were conducted in single-center or region-specific settings, which may restrict the generalizability of findings to other cultural or socioeconomic contexts. Third, publication bias may have influenced the availability of positive surgical outcome studies, while underreporting of negative or null results could underestimate true variability in QoL improvements. Finally, limited longitudinal data restricted evaluation of the long-term impacts of OM severity and its treatments on children's development and caregiver well-being.

REFERENCES

- Barber, C., Ille, S., Vergison, A., & Coates, H. (2014). Acute otitis media in young children – what do parents say? International Journal of Pediatric Otorhinolaryngology, 78(2), 300–306.
- Blank, S. J., Grindler, D. J., Schulz, K. A., Witsell, D. L., & Lieu, J. E. (2014). Caregiver quality of life is related to severity of otitis media in children. Otolaryngology–Head and Neck Surgery, 151(2), 348–353.
- Boruk, M., Lee, P., Faynzilbert, Y., & Rosenfeld, R. M. (2007). Caregiver well-being and child quality of life. Otolaryngology–Head and Neck Surgery, 136(2), 159–168.
- Brouwer, C. N. M., Maillé, A. R., & Rovers, M. M. (2005). Health-related quality of life in children with otitis media. International Journal of Pediatric Otorhinolaryngology, 69(8), 1031–1041.
- Brouwer, C. N. M., Schilder, A. G. M., & van Stel, H. F. (2007). Reliability and validity of functional health status and health-related quality of life questionnaires in children with recurrent acute otitis media. Quality of Life Research, 16(8), 1357–1366.
- Cavaliere, M., Di Lullo, A. M., Capriglione, P., Motta, G., & Cantone, E. (2022). Quality of life assessment of chronic otitis media patients following surgery. Journal of Personalized Medicine, 13(1), 74.

- Crawford, B., Hashim, S. S. M., & Prepageran, N. (2017). Impact of pediatric acute otitis media on child and parental quality of life and associated productivity loss in Malaysia: A prospective observational study. Drugs—Real World Outcomes, 4(2), 79–87.
- Devi, K. J., Singh, M., Maan, A. S., Thomas, O., Kaur, G., Arya, S., & Kaur, J. (2021). Effect of type 1 tympanoplasty on the quality of life of patients suffering from chronic otitis media (safe type). Nigerian Journal of Clinical Practice, 24(11), 1641–1644.
- Evman, M. D., & Cakil, T. (2023). Effect of type 1 tympanoplasty on health-related quality of life assessed by Chronic Otitis Media Questionnaire 12. European Review for Medical and Pharmacological Sciences, 27(5 Suppl), 34–38.
- Grevers, G. (2010). Challenges in reducing the burden of otitis media disease: An ENT perspective on improving management and prospects for prevention. International Journal of Pediatric Otorhinolaryngology, 74(6), 572–577.
- Grindler, D. J., Blank, S. J., Schulz, K. A., Witsell, D. L., & Lieu, J. E. (2014). Impact of otitis media severity on children’s quality of life. Otolaryngology–Head and Neck Surgery, 151(2), 333–340.
- Harmes, K. M., Blackwood, R. A., Burrows, H. L., Cooke, J. M., Harrison, R. V., & Passamani, P. P. (2013). Otitis media: Diagnosis and treatment. American Family Physician, 88(7), 435–440.
- Holl, K., Rosenlund, M., Giaquinto, C., Silfverdal, S. A., Carmona, A., Larcombe, J., Garcia-Sicilia, J., Fuat, A., Muñoz, M. E., Arroba, M. L., Sloesen, B., Vollmar, J., Pirçon, J. Y., & Liese, J. G. (2015). The impact of childhood acute otitis media on parental quality of life in a prospective observational cohort study. Clinical Drug Investigation, 35(10), 613–624.
- Homøe, P., Heidemann, C. H., & Damoiseaux, R. A. M. J. (2020). Panel 5: Impact of otitis media on quality of life and development. International Journal of Pediatric Otorhinolaryngology, 130, 109837.
- Kujala, T., Alho, O. P., Kristo, A., Uhari, M., Renko, M., Pokka, T., & Koivunen, P. (2014). Quality of life after surgery for recurrent otitis media in a randomized controlled trial. The Pediatric Infectious Disease Journal, 33(7), 715–719.
- Lam, D., Fahmy, A., Timashpolsky, A., & Sangal, N. (2024). Quality of life outcomes after pediatric otitis media surgery: A systematic review and meta-analysis. The Laryngoscope, 134(3), 678–689.
- Leichtle, A., Hoffmann, T. K., & Wigand, M. C. (2018). Otitis media: Definition, pathogenesis, clinical presentation, diagnosis and therapy. Laryngorhinootologie, 97(7), 497–508.
- Maile, E. J., & Youngs, R. (2013). Quality of life measures in otitis media. The Journal of Laryngology & Otology, 127(5), 442–447.
- Mohammed, K. A. E. S., & AbdAllah, A. M. (2021). Frequency of otitis media with effusion among preschool children and its effect on both children and their parents: A cross-sectional study. Zagazig University Medical Journal, 27(2), 209–218.*
- Monasta, L., Ronfani, L., Marchetti, F., Montico, M., et al. (2012). Burden of disease caused by otitis media: Systematic review and global estimates. PLoS ONE, 7(4), e36226.
- Phillips, J. S., & Yung, M. W. (2016). A systematic review of patient-reported outcome measures for chronic suppurative otitis media. The Laryngoscope, 126(6), 1458–1465.
- Richards, M., & Giannoni, C. (2002). Quality-of-life outcomes after surgical intervention for otitis media. JAMA Otolaryngology–Head & Neck Surgery, 128(7), 776–782.
- Ryborg, C. T., Søndergaard, J., Lous, J., Munck, A., Larsen, P. V., & Thomsen, J. L. (2014). Quality of life in children with otitis media—a cohort study. Family Practice, 31(1), 30–37.
- Saki, N., Rahim, F., Nikakhlagh, S., Sarafraz, M., & Jafarzadeh, E. (2014). Quality of life in children with recurrent acute otitis media in southwestern of Iran. Indian Journal of Otolaryngology and Head & Neck Surgery, 66(Suppl 1), 267–270.
- Sidam, S., Sahoo, A. K., Mishra, U. P., Gupta, V., Kushwah, A., Sahoo, P. K., & Sahoo, A. K. (2024). Impact of chronic suppurative otitis media on quality of life and psychological well-being: A cross-sectional study. Cureus, 16(2).