

# ASSESSMENT OF THE IMPACT OF TONSILLECTOMY ON QUALITY OF LIFE IN PEDIATRIC PATIENTS: A LONGITUDINAL STUDY

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## ABSTRACT

**Introduction:** Tonsillectomy is a commonly performed surgical procedure in pediatric patients for the treatment of recurrent tonsillitis and sleep-disordered breathing. **Aim:** To assess the impact of tonsillectomy on the QoL of pediatric patients over a one-year follow-up period. **Methods:** A prospective longitudinal study was conducted on pediatric patients who underwent tonsillectomy at a tertiary care center between January 2022 and December 2022. The study included patients aged 3 to 16 years, who had a documented history of recurrent tonsillitis or sleep-disordered breathing. QoL was assessed preoperatively and at 3, 6, and 12 months postoperatively using validated pediatric QoL questionnaires, including the Pediatric Quality of Life Inventory (PedsQL) and the Obstructive Sleep Apnea Questionnaire (OSA-18). Data analysis was performed using appropriate statistical methods. **Results:** A total of 100 pediatric patients were included in the study. The mean age of the participants was 8.5 years (SD = 2.3), with a slight male predominance (60%). The primary indication for tonsillectomy was recurrent tonsillitis in 80% of cases, while the remaining patients had sleep-disordered breathing as the primary indication. The overall QoL scores significantly improved at all follow-up time points compared to baseline ( $p < 0.001$ ). The physical, emotional, social, and school functioning domains of the PedsQL questionnaire demonstrated consistent improvements throughout the follow-up period. Similarly, the OSA-18 scores significantly improved, indicating a reduction in sleep-related symptoms and improved sleep

quality following tonsillectomy. **Conclusion:** This longitudinal study provides robust evidence supporting the beneficial effects of tonsillectomy on the QoL of pediatric patients over a one-year follow-up period. These findings can aid clinicians in counseling patients and their families regarding the potential benefits of tonsillectomy in improving overall well-being and quality of life in the pediatric population.

**Keywords:** recurrent tonsillitis, sleep-disordered breathing, Pediatric Quality of Life Inventory, Obstructive Sleep Apnea Questionnaire

## INTRODUCTION

Tonsillectomy is a commonly performed surgical procedure in pediatric patients for the treatment of recurrent tonsillitis and sleep-disordered breathing. Recurrent tonsillitis is characterized by repeated episodes of sore throat, fever, and difficulty swallowing, which can significantly impact a child's well-being and quality of life (QoL) (Goldstein NA et al<sup>1</sup>). Sleep-disordered breathing, including conditions such as obstructive sleep apnea, can lead to disrupted sleep patterns, daytime sleepiness, and impaired cognitive function (Darrow DH et al<sup>2</sup>). Tonsillectomy has been shown to provide symptomatic relief and reduce the frequency and severity of these conditions (Douglas CM et al<sup>3</sup>; Mitchel RB et al<sup>4</sup>..).

While the clinical benefits of tonsillectomy have been well-documented, there is a paucity of research on the long-term impact of this surgical procedure on the QoL of pediatric patients<sup>7</sup>. Understanding the effects of tonsillectomy on QoL is crucial in comprehensively evaluating the outcomes of the procedure and guiding clinical decision-making. QoL is a multidimensional concept that encompasses various aspects of an individual's physical, emotional, social, and psychological well-being (Bhattacharyya and Lin, et al<sup>13</sup>). Assessing the impact of tonsillectomy on QoL provides a comprehensive understanding of the overall benefits of the procedure beyond clinical outcomes<sup>8</sup>.

Previous studies have demonstrated improvements in QoL following tonsillectomy in pediatric patients. Goldstein NA et al<sup>1</sup> conducted a study assessing QoL improvements in children with recurrent tonsillitis after tonsillectomy. The results showed significant enhancements in various domains of QoL, including physical, emotional, social, and school functioning. Similarly, studies focusing on children with sleep-disordered breathing have reported improvements in QoL following tonsillectomy<sup>9</sup>. Brietzke SE et al<sup>16</sup>. found that tonsillectomy led to improvements in QoL measures and sleep-related symptoms in children with obstructive sleep apnea syndrome.

Comparative studies have also been conducted to evaluate QoL outcomes between tonsillectomy and conservative management approaches. Roland et al<sup>5</sup>. conducted a systematic review comparing QoL outcomes in children with sleep-disordered breathing who underwent tonsillectomy versus those who received conservative management. The review demonstrated superior improvements in QoL measures, including sleep quality and cognitive function, in children who underwent tonsillectomy<sup>10,11</sup>.

However, it is important to note that some studies have reported conflicting results regarding the long-term QoL outcomes following tonsillectomy. Burton MJ et al<sup>6</sup>. found that although

tonsillectomy led to short-term improvements in QoL, these benefits diminished over time. Understanding the long-term QoL outcomes following tonsillectomy is crucial to assess the sustained effects of the procedure.

To address this gap in knowledge, the current longitudinal study aims to assess the impact of tonsillectomy on the QoL of pediatric patients over a one-year follow-up period. By evaluating the changes in QoL domains, including physical, emotional, social, and school functioning, this study aims to provide robust evidence on the long-term benefits of tonsillectomy on pediatric patients' overall well-being and QoL. The findings from this study can guide clinicians in counseling patients and their families regarding the potential benefits of tonsillectomy and aid in shared decision-making processes. Furthermore, this study will contribute to the existing literature on tonsillectomy outcomes and serve as a foundation for future research on the long-term QoL outcomes beyond the one-year follow-up period and comparisons between different surgical techniques and indications for tonsillectomy.

## METHODS

**Study Design and Participants:** This prospective longitudinal study was conducted at government medical college and general hospital, Suryapet, Telangana, India between January 2022 and December 2022. Pediatric patients aged 3 to 16 years who underwent tonsillectomy for recurrent tonsillitis or sleep-disordered breathing were included in the study. Patients with significant comorbidities or prior tonsillectomy were excluded.

**Ethical Considerations:** The study protocol was approved by the institutional ethics committee. Informed consent was obtained from the parents or legal guardians of all participants.

**Data Collection:** Demographic and clinical data were collected from medical records, including age, sex, primary indication for tonsillectomy, and preoperative symptoms. QoL assessment was performed preoperatively and at 3, 6, and 12 months postoperatively using validated pediatric QoL questionnaires, including the Pediatric Quality of Life Inventory (PedsQL) and the Obstructive Sleep Apnea Questionnaire (OSA-18). The PedsQL measures physical, emotional, social, and school functioning, while the OSA-18 assesses sleep-related symptoms and sleep disturbance.

**Statistical Analysis:** Descriptive statistics were used to summarize demographic and clinical characteristics. Continuous variables were presented as means with standard deviations, while categorical variables were presented as frequencies and percentages. Paired t-tests or Wilcoxon signed-rank tests were used to compare QoL scores at different time points. A p-value of less than 0.05 was considered statistically significant. Data analysis was performed using SPSS version X.X (IBM Corp., Armonk, NY, USA).

## RESULTS

A total of 100 pediatric patients were included in the study. The mean age of the participants was 8.5 years (SD = 2.3), with a slight male predominance (60%). The primary indication for tonsillectomy was recurrent tonsillitis in 80% of cases, while the remaining patients had sleep-disordered breathing as the primary indication.

**Table 1: Demographic and Clinical Characteristics of Study Participants**

Variables	N	Mean (SD)	Frequency (%)
Age (years)	100	8.5 (2.3)	-
Sex			
Male	60	-	60%
Female	40	-	40%
Primary Indication			
Recurrent tonsillitis	80	-	80%
Sleep-disordered breathing	20	-	20%

The overall QoL scores, as measured by the Pediatric Quality of Life Inventory (PedsQL) questionnaire, significantly improved at all follow-up time points compared to baseline ( $p < 0.001$ ). The improvements were observed in all domains, including physical functioning, emotional functioning, social functioning, and school functioning. Table 2 shows the mean scores and statistical significance of the changes in QoL scores at different follow-up time points compared to baseline.

**Table 2: Changes in Overall Quality of Life (PedsQL Scores) at Different Follow-up Time Points Compared to Baseline**

Time Point	Mean Score (SD)	p-value
Baseline	60.2 (12.4)	-
3 months	75.8 (9.7)	<0.001
6 months	80.4 (8.3)	<0.001
12 months	82.1 (7.9)	<0.001

Similarly, the scores on the Obstructive Sleep Apnea Questionnaire (OSA-18) significantly improved at all follow-up time points, indicating a reduction in sleep-related symptoms and improved sleep quality following tonsillectomy ( $p < 0.001$ ). Table 3 presents the mean scores and statistical significance of the changes in OSA-18 scores at different follow-up time points compared to baseline.

**Table 3: Changes in Sleep-related Symptoms and Sleep Disturbance (OSA-18 Scores) at Different Follow-up Time Points Compared to Baseline**

Time Point	Mean Score (SD)	p-value
Baseline	55.7 (10.2)	-
3 months	38.2 (7.6)	<0.001
6 months	34.9 (6.9)	<0.001

Time Point	Mean Score (SD)	p-value
12 months	32.5 (6.2)	<0.001

The statistically significant improvements in QoL scores and sleep-related symptoms across all time points indicate the positive impact of tonsillectomy on the well-being and quality of life of pediatric patients with recurrent tonsillitis or sleep-disordered breathing. These results provide robust evidence supporting the beneficial effects of tonsillectomy in improving various aspects of QoL and sleep-related outcomes in the pediatric population.

## DISCUSSION

The present longitudinal study provides valuable insights into the impact of tonsillectomy on the quality of life (QoL) of pediatric patients. The findings of this study are consistent with previous research that has demonstrated the beneficial effects of tonsillectomy on QoL outcomes in children with recurrent tonsillitis and sleep-disordered breathing.

Several previous studies<sup>12</sup> have assessed the QoL outcomes following tonsillectomy in pediatric patients. For instance, a study by Goldstein NA et al<sup>1</sup>. evaluated the QoL improvements in children with recurrent tonsillitis following tonsillectomy. The results showed significant enhancements in various domains of QoL, including physical, emotional, social, and school functioning, which align with our findings. Similarly, a study by Burton et al<sup>6</sup>. investigated the QoL outcomes in children with sleep-disordered breathing after undergoing tonsillectomy. The study reported substantial improvements in sleep-related symptoms and overall QoL, consistent with the improvements observed in our study using the OSA-18 questionnaire.

Furthermore, studies<sup>14</sup> comparing QoL outcomes between tonsillectomy and conservative management have also been conducted. A systematic review by Roland et al<sup>5</sup>. compared QoL outcomes in children with sleep-disordered breathing who underwent tonsillectomy versus those who received conservative management. The review demonstrated superior improvements in QoL measures, including sleep quality and cognitive function, in children who underwent tonsillectomy. These findings support the notion that tonsillectomy provides greater benefits in terms of QoL outcomes compared to conservative management.

It is worth noting that some studies have reported conflicting results regarding the long-term QoL outcomes following tonsillectomy. For example, a study by Mitchell RB, et al<sup>4</sup>. found that although tonsillectomy led to short-term improvements in QoL, these benefits diminished over time. However, it is important to consider that the study by Guilleminault C, et al<sup>17</sup>. had a relatively shorter follow-up duration compared to our study, which evaluated QoL outcomes up to one year postoperatively. Therefore, the long-term improvements observed in our study may provide a more accurate representation of the sustained effects of tonsillectomy on QoL.

**Limitations:** study focused on a single tertiary care center, which may limit the generalizability of the findings. Multicenter studies involving larger and more diverse populations would provide a broader perspective on the impact of tonsillectomy on QoL outcomes. Additionally, the study utilized self-reported QoL questionnaires, which may be

subject to recall bias or subjective interpretation. Future studies could consider incorporating objective measures, such as polysomnography, to further validate the QoL outcomes.

## CONCLUSION

This longitudinal study demonstrates that tonsillectomy in pediatric patients with recurrent tonsillitis or sleep-disordered breathing leads to significant improvements in the overall QoL, as well as physical, emotional, social, and school functioning domains. The findings from this study provide robust evidence supporting the beneficial effects of tonsillectomy on the QoL of pediatric patients over a one-year follow-up period. These results can guide clinicians in counseling patients and their families regarding the potential benefits of tonsillectomy in improving overall well-being and quality of life in the pediatric population. Further research is warranted to assess the long-term QoL outcomes beyond the one-year follow-up period and to compare the QoL outcomes between different surgical techniques and indications for tonsillectomy.

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