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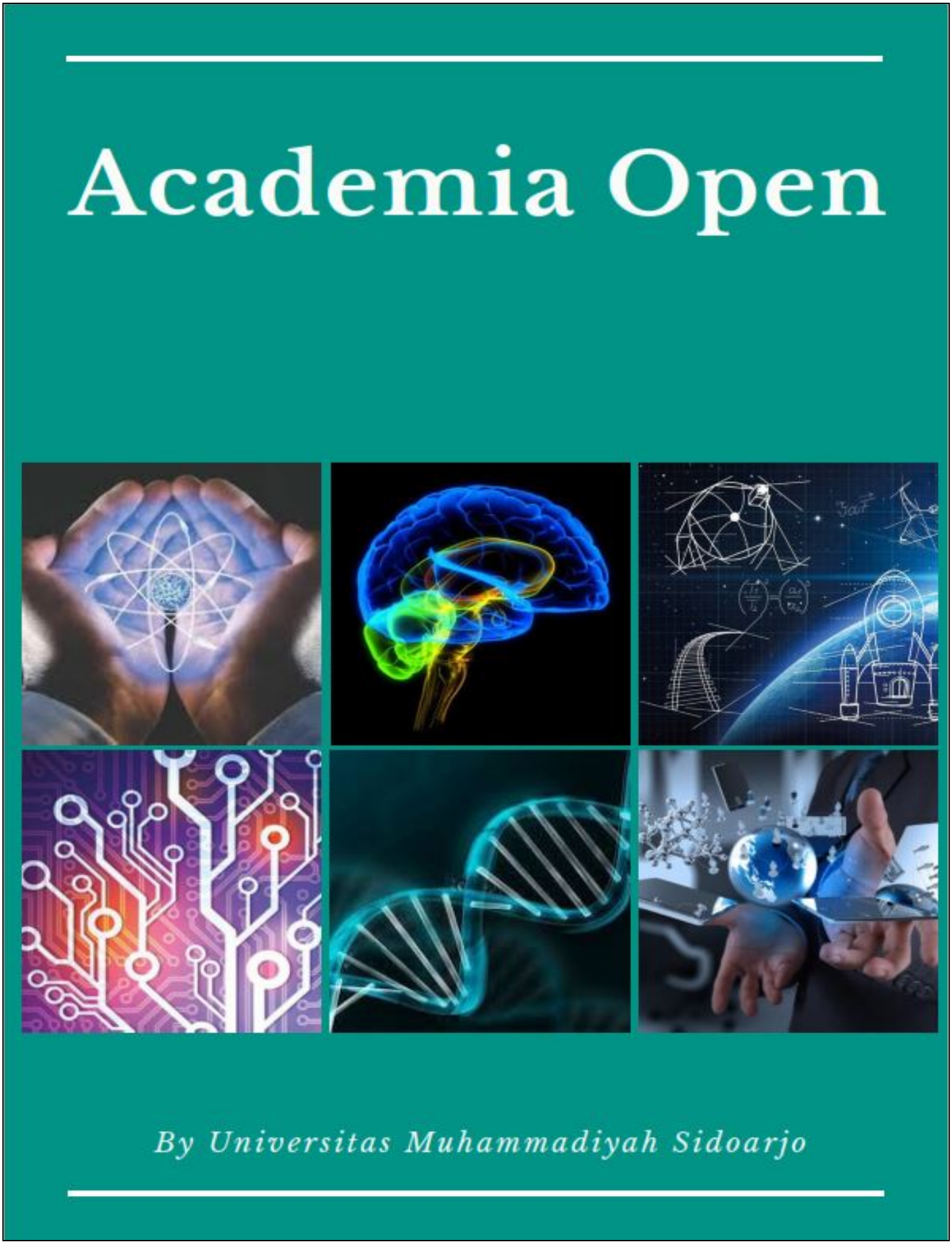

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Tonsillectomy in Children: Review Article

Tonsilektomi pada Anak: Ulasan Artikel

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Abstract

One of the most frequent surgical operations on children in Australasia is tonsillectomy. For a non-surgical audience, this study attempts to give a current evaluation of the procedure's indications (and the evidence basis for each of these indications), together with a discussion of the surgical technique, perioperative care, and risks. Recurrent pharyngotonsillitis and obstructive sleep apnea (OSA) are the main causes of tonsillectomy; tonsillectomy is typically done in combination with adenoidectomy for both conditions. Tonsillectomy has been shown to enhance quality of life, child behavior, and objective measurements of OSA in sleep studies. It is less clear how surgery affects cognitive function.

Highlights:

1. Common pediatric surgery: Tonsillectomy for recurrent pharyngotonsillitis & obstructive sleep apnea.
2. Benefits: Improves quality of life, behavior, and OSA measurements.
3. Uncertainty: Cognitive effects of surgery remain unclear.

Keywords: Tonsillectomy, Children, Review

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Introduction

One of the most frequent pediatric surgical procedures carried out worldwide is tonsillectomy. Despite the large number of surgeries carried out, tonsillectomy has historically had a very small body of evidence. We now have a better understanding of the impacts of surgery and are better equipped to advise patients and their families thanks to a number of outstanding clinical studies, systematic reviews, and clinical recommendations that have been published in the last five years [1, 2].

The technique known as tonsillectomy has an exceptionally lengthy history; it was initially discussed in Hindu literature 3,000 years ago. A Roman provided the earliest account of the tonsil being completely removed, describing how to "disengage the tonsil or take them up with a blunt hook and separate them with a scalpel" using a finger. Over the following 1900 years, several partial tonsillectomy procedures were described in response to problems with postoperative bleeding [3, 4]. The entire dissection the 19th century witnessed the development of anesthetic, endotracheal tube intubation, better operating illumination, and cautery to control bleeding, which led to tonsillectomy being the usual. However, renewed interest in partial tonsillectomy as a way to lower postoperative complications highlights the ongoing flux of surgical progress [1].

Additionally, tonsillectomy indications have changed significantly throughout time. Due to the paucity of drugs and the possibility of potentially fatal consequences, the initial indications were mainly for infection. The introduction of the focused infection idea caused a sharp rise in tonsillectomy surgery rates between 1900 and 1930. The essential tenet of this approach was that many chronic diseases were caused by remote dispersion from a primary infection, usually of the tonsils or teeth. Tonsillectomies accounted for 33% of all surgical procedures performed in the United States by the 1920s. The tonsillectomy rate significantly decreased after this notion was disproved by the middle of the 19th century, and recurring tonsillitis once again emerged as the main reason for surgery. Over the past 30 years, the association between obstructive sleep apnea (OSA) and adenotonsillar hypertrophy has been recognized, leading to a rise in the number of surgeries. In the US pediatric population, OSA has likewise emerged as the most prevalent reason for the surgery [5, 6].

Indications of Tonsillectomy

Sleep-disordered breathing

Sleep-disordered breathing is a common issue in children, with 3-5 percent of kids suffering from OSA and 10% of kids experiencing main snoring. OSA is associated with behavioral problems, cognitive decline, enuresis, failure to flourish, elevated healthcare utilization, and cardiorespiratory dysfunction [7, 8].

Inpatient polysomnography (PSG) performed overnight is the gold standard for diagnosing OSA. The results are categorized as mild (1–5 episodes/h), moderate (5–10/h), and severe (>10/h). Unfortunately, the widespread adoption of PSG in the pediatric population of Australasia is restricted by resource limitations. Although it is more widely accessible, overnight oximetry has some drawbacks, including the inability to determine total sleep duration and differentiate between central and obstructive episodes. Its poor negative predictive value counteracts its very high positive predictive value (>90%). The sensitivity and specificity of history and clinical examination alone are low, although important historical details include

• Witnessed obstructive apnea (odds ratio (OR) 3.3)

• Frequent daytime mouth breathing (OR 3.7)

• Parent afraid/wakes child because of breathing (OR 4.4)

• Struggling to breathe while asleep (OR 5.54)

• Regular awakenings in children who have previously slept through

• Enuresis secondary

• Behavioral issues during the day

• Not thriving or gaining weight more slowly [9, 10]

Combined with a standardized survey (the Pediatric Sleep Questionnaire), [11, 12] The overall positive predictive value increased to 98% as a result of a targeted clinical examination and a positive nocturnal oximetry result [13, 14].

The following indications for complete PSG are suggested by the most recent New Zealand and North American

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guidelines [15, 16] to direct diagnostic and perioperative care:

• Co-occurring conditions.

• Craniofacial deformities, neuromuscular problems, mucopolysaccharides, and Down syndrome.

• symptoms and tonsil size are not consistent.

• After adenotonsillectomy, persistent symptoms.

In 2013, 464 children with mild to moderate OSA, ages 5 to 9, participated in a high-quality, multicenter, randomized controlled experiment called the CHAT trial, which compared adenotonsillectomy with watchful waiting. The main metric used to assess neurocognitive performance, as determined by the Developmental Neuropsychological Assessment score's attention and executive functioning areas, did not reveal any differences between the two groups. One argument against this unfavorable result was that since the endpoint was assessed at 7 months, there was insufficient time for any cognitive gains to take place. Importantly, secondary goals of quality of life, both general and disease-specific, behavior assessments by teachers and caregivers, AHI, and OSA resolution (79 vs. 49%) following adenotonsillectomy all showed clinically significant improvements [17, 18].

In response to this research, a Cochrane Review was published in 2015. There is moderate-quality evidence that early adenotonsillectomy improves children's quality of life, symptoms, and behavior as judged by parents and caregivers, and high-quality evidence that patients with mild to moderate OSA who have had their sleep study confirmed benefit in terms of sleep study parameters. Although there is little data for patients under five, patients ages three to five are included in the POSTA experiment presently being conducted in Australia [19, 20].

Adenotonsillectomy is therefore advised for pediatric OSA as a first-line treatment according to current Australian, New Zealand, and North American guidelines. The objective diagnosis should ideally be made using PSG, but as this resource is extremely scarce, nocturnal oximetry and validated sleep questionnaires should also be taken into consideration. Given that older children may have a high likelihood of spontaneous symptom remission, parents should carefully consider their options before deciding to have surgery. Patients should be monitored to ensure evaluation of results, considering the prevalence of post-operative persistent complaints [21, 22].

Recurrent pharyngotonsillitis

Frequent sore throats are one of the most common complaints that patients bring to primary care doctors, and they have been shown to have a substantial negative impact on quality of life. Since bacterial tonsillitis is the root cause of many of these presentations, tonsillectomy has long been thought to be important for treating recurring sore throats in order to reverse this morbidity. However, it is clinically challenging to differentiate between tonsillitis-related and pharyngitis-related sore throats, which complicates both patient selection for surgery and research study analysis [23, 24].

For a single tonsillitis episode, the majority of guidelines currently adhere to the diagnostic inclusion criteria of the Paradise et al., 198414 research. A positive GpA Strep culture, tonsillar exudate, cervical lymphadenopathy (>2 cm or painful nodes), or a sore throat with at least one extra symptom (temperature >38.3) were among them. Tonsillectomy was advised for seven episodes annually, five episodes annually for two years, or three episodes annually for three years [25-28].

Recurrent peritonsillar abscess

The most frequent consequence of acute tonsillitis is a peritonsillar abscess, sometimes known as "quinsy." A single dosage of systemic antibiotics, steroids, and drainage of the surgical abscess (either by formal incision and drainage or by aspirating a needle) are the standard acute therapy options. Patients who cannot handle drainage under local anesthetic, have repeated acute abscess formation, or have an infection spread from the tonsillar region into adjacent deep neck spaces should have an urgent tonsillectomy. Ten to twenty percent of peritonsillar abscesses recur [29, 30].

Suspicion of malignancy

In the pediatric population, extranodal intra-tonsillar lymphoma is the most frequent tonsil cancer. In this case, tonsillectomy serves mainly as a diagnostic procedure that enables lymphoma subtyping to guide further treatment.20%. The probability of an underlying cancer is raised when unilateral tonsillar asymmetry is present. Urgent surgical intervention should follow rapid unilateral tonsillar enlargement over several weeks (particularly if the tonsils are larger than 3 cm), systemic symptoms, severe lymphadenopathy, hepatosplenomegaly, or a personal history of cancer. Since cancer is uncommon and there are no other alarming symptoms or examination results, clinical observation is prudent [31, 32].

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What Does a Tonsillectomy Involve?

Usually accompanied by endotracheal tube intubation, tonsillectomy is carried out under general anesthesia. To keep the mouth open and the tongue forward, a mouth gag is utilized. The tonsil is grasped with grasping forceps and pulled medially. By doing this, the anterior tonsil pillar's mucosa is put under tension, making it possible to determine the tonsil's lateral extent. The tonsil's mucosa is incised superiorly. The tonsil is isolated from the pharyngeal muscle beneath it by a distinct capsule. In order to minimize bleeding and postoperative pain, Next, while preserving muscle, The plane that separates the muscle and tonsil capsule is dissected. The tonsil is removed and split off from the surrounding lingual tonsil and tongue base when it reaches the inferior pole [33, 34].

There is still inconclusive evidence on the relative benefits and drawbacks of the different tonsillectomy devices. Using heated techniques for both dissection and hemostasis has a 3× risk of future bleeding, with similar rates for coblation, according to a significant prospective audit carried out in the UK. However, rigorous reviews cannot demonstrate a substantial variation in postoperative bleeding rates across procedures (either electrocautery or coblation) because to the small number and size of randomized investigations. The base of the tongue and the nearby lingual tonsil and removed them [35, 36].

In recent years, intracapsular tonsillectomy, sometimes known as "tonsillotomy," has attracted fresh interest. The capsule containing varying amounts of residual tonsil tissue is preserved after Debulking occurs from the tonsil's medial surface. The most popular devices are coblation or microdebriders. By preventing the pharyngeal muscle beneath from being exposed, this method preserves both the bigger blood vessels outside of the capsule and the sensitive nerve ends in this muscle. Therefore, decreased postoperative discomfort and bleeding are potential benefits of an intracapsular approach. Significant improvements in the time it took to resume a regular diet and a decrease in postoperative readmissions for bleeding and dehydration were observed in systematic reviews conducted in 2012 and 2015 [37, 38]. The disadvantages include the risk of recurrent tonsillitis and symptomatic tonsil regrowth, which can require revision surgery and has rates between 2 and 13 percent [39, 40].

Postoperative Management

All patients should be closely watched for four to six hours following surgery in order to ensure the restoration of oral intake and the absence of early postoperative hemorrhage. Indications for overnight inpatient admission vary by surgical unit, however they typically follow New Zealand standards. Simple analgesics should be used to relieve postoperative discomfort. Typically, discomfort peaks 5–7 days following surgery and varies within the first week. There is currently little evidence to support the claim that using non-steroidal anti-inflammatory drugs raises the risk of bleeding after surgery [41, 42].

Children with OSA should be cautious while using opiate analgesia since they seem to be more susceptible to opiate-induced respiratory depression. In the USA, several fatalities linked to post-tonsillectomy codeine use have been documented [43, 44]. Consequently, the FDA ruled in 2013 that codeine usage for post-tonsillectomy pain in children under the age of 18 was contraindicated; this ruling was also supported by the Australian Therapeutic Goods Administration [45, 46] and Medsafe New Zealand [47, 48]. Since there is little proof that antibiotics reduce bleeding or postoperative pain, they are not frequently recommended [49, 50].

Conclusion

There is growing evidence that tonsillectomy is a prevalent surgical practice. There is currently strong data supporting the clinical effectiveness of OSA, and as proof of OSA's impact on quality of life grows, early referral for surgical consideration should be considered. For individuals with recurrent pharyngotonsillitis who are carefully chosen, there is moderate evidence of benefit who satisfy the pertinent guideline-based inclusion criteria. Most children endure the procedure well, but while talking with kids and their parents about surgical options, it's important to consider the possibility of potentially dangerous pulmonary and hemorrhagic complications.

References

1. S. R. Greig, "Current perspectives on the role of tonsillectomy," Journal of paediatrics and child health, vol. 53, pp. 1065-1070, 2017.
2. M. F. Hasan, W. F. Hussein, A. M. Tiryag, I. J. Ali, and Z. M. Shaker, "Nurses' Knowledge Toward Lower Back Pain: A Cross-Sectional Study," Academia Open, vol. 9, pp. 10.21070/acopen. 9.2024. 10363-10.21070/acopen. 9.2024. 10363, 2024.
3. R. A. McNeill, "A history of tonsillectomy: two millenia of trauma, haemorrhage and controversy," The Ulster medical journal, vol. 29, p. 59, 1960.
4. F. A. Jassim, A. M. Tiryag, and S. S. Issa, "Effect of Bad Habits on the Growth of School Students: A Cross-Sectional Study," Indonesian Journal on Health Science and Medicine, vol. 1, pp. 10.21070/ijhsm. v1i2. 26-10.21070/ijhsm. v1i2. 26, 2024.

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5. B. K. Erickson, D. R. Larson, J. L. St. Sauver, R. A. Meverden, and L. J. Orvidas, "Changes in incidence and indications of tonsillectomy and adenotonsillectomy, 1970-2005," Otolaryngology—Head and Neck Surgery, vol. 140, pp. 894-901, 2009.
6. S. K. Jassim, Z. Abbass, and A. M. Tiryag, "A Study of Diabetes Correlated Emotional Distress among Patients with Type 2 Diabetes Mellitus: A cross Sectional Study," Academia Open, vol. 9, pp. 10.21070/acopen. 9.2024. 10292-10.21070/acopen. 9.2024. 10292, 2024.
7. A. H. Tran, R. S. Horne, J. Rimmer, and G. M. Nixon, "Adenotonsillectomy for paediatric sleep disordered breathing in Australia and New Zealand," Sleep medicine, vol. 78, pp. 101-107, 2021.
8. Z. Abbass, S. K. Jassim, A.-F. Sadeq, S. Hafedh, A. M. Tiryag, and H. H. A. AL-Hadrawi, "Determination of Self-Efficacy Level: The Capacity of Patients with Hypertension to Manage their Chronic Disease," Indonesian Journal on Health Science and Medicine, vol. 1, pp. 10.21070/ijhsm. v1i2. 15-10.21070/ijhsm. v1i2. 15, 2024.
9. A. I. Gill, E. Schaughency, and B. C. Galland, "Prevalence and factors associated with snoring in 3-year olds: early links with behavioral adjustment," Sleep medicine, vol. 13, pp. 1191-1197, 2012.
10. J. A. Pena-Zarza, B. Osona-Rodriguez de Torres, J. A. Gil-Sanchez, and J. Figuerola-Mulet, "Utility of the pediatric sleep questionnaire and pulse oximetry as screening tools in pediatric patients with suspected obstructive sleep apnea syndrome," Sleep Disorders, vol. 2012, p. 819035, 2012.
11. P. S. Roland, R. M. Rosenfeld, L. J. Brooks, N. R. Friedman, J. Jones, T. W. Kim, et al., "Clinical practice guideline: polysomnography for sleep-disordered breathing prior to tonsillectomy in children," Otolaryngology–Head and Neck Surgery, vol. 145, pp. S1-S15, 2011.
12. M. A. Mohammad, F. A. Jassim, and A. M. Tiryag, "Single-use flexible ureteroscope for the treatment of renal stone," Revista Latinoamericana de Hipertension, vol. 18, 2023.
13. C. L. Marcus, R. H. Moore, C. L. Rosen, B. Giordani, S. L. Garetz, H. G. Taylor, et al., "A randomized trial of adenotonsillectomy for childhood sleep apnea," New England Journal of Medicine, vol. 368, pp. 2366-2376, 2013.
14. M. Mohammad, F. Jassim, and A. Tiryag, "Retrograde Intrarenal Lithotripsy Using Disposable Flexible Ureteroscope," Georgian Medical News, vol. 348, pp. 44-46, 2024.
15. R. P. Venekamp, B. J. Hearne, D. Chandrasekharan, H. Blackshaw, J. Lim, and A. G. Schilder, "Tonsillectomy or adenotonsillectomy versus non-surgical management for obstructive sleep-disordered breathing in children," Cochrane Database of Systematic Reviews, 2015.
16. A. A. A. Al-Iedan, M. A. Akber, S. B. Dawood, A. I. H. Alobaidi, S. S. Issa, H. H. A. Raaoof, et al., "Bridging the Gap: Enhancing Open Fracture Care in Emergency Nursing," Academia Open, vol. 9, pp. 10.21070/acopen. 9.2024. 8847-10.21070/acopen. 9.2024. 8847, 2024.
17. K. A. Waters, J. Chawla, M.-A. Harris, C. Dakin, H. Heussler, R. Black, et al., "Rationale for and design of the" POSTA" study: Evaluation of neurocognitive outcomes after immediate adenotonsillectomy compared to watchful waiting in preschool children," BMC pediatrics, vol. 17, pp. 1-7, 2017.
18. M. A. Mohammad, A. Y. Al-Timary, and A. M. Tiryag, "Safety of Tubeless Double Access Percutaneous Nephrolithotomy Compared to Single Access Approach," Bahrain Medical Bulletin, vol. 45, 2023.
19. J. Wood, M. Cho, and A. Carney, "Role of subtotal tonsillectomy (‘tonsillotomy’) in children with sleep disordered breathing," The Journal of Laryngology & Otology, vol. 128, pp. S3-S7, 2014.
20. K. M. Jassim, A. S. Khudhair, Z. S. Dawood, and A. M. Tiryag, "Nurses’ knowledge about electrocardiogram interpretation: A cross-sectional study," Rawal Medical Journal, vol. 48, pp. 850-850, 2023.
21. R. F. Baugh, S. M. Archer, R. B. Mitchell, R. M. Rosenfeld, R. Amin, J. J. Burns, et al., "Clinical practice guideline: tonsillectomy in children," Otolaryngology–head and neck surgery, vol. 144, pp. S1-S30, 2011.
22. S. I. G. Network, "Management of sore throat and indications for tonsillectomy," A National Clinical Guideline 34, 1999.
23. J. L. Paradise, C. D. Bluestone, R. Z. Bachman, D. K. Colborn, B. S. Bernard, F. H. Taylor, et al., "Efficacy of tonsillectomy for recurrent throat infection in severely affected children: results of parallel randomized and nonrandomized clinical trials," New England Journal of Medicine, vol. 310, pp. 674-683, 1984.
24. M. Jabbar, M. Mohammad, and A. Tiryag, "CHANGES IN MALE REPRODUCTIVE HORMONES IN PATIENTS WITH COVID-19," Georgian Medical News, pp. 42-46, 2023.
25. M. J. Burton, P. P. Glasziou, L. Y. Chong, and R. P. Venekamp, "Tonsillectomy or adenotonsillectomy versus non-surgical treatment for chronic/recurrent acute tonsillitis," Cochrane Database of Systematic Reviews, 2014.
26. J. Powell and J. Wilson, "An evidence-based review of peritonsillar abscess," Clinical otolaryngology, vol. 37, pp. 136-145, 2012.
27. M. S. Hwang, K. E. Kaye, J. A. Waxman, and M. Friedman, "What is the best management of asymptomatic unilateral tonsillar enlargement?," The Laryngoscope, vol. 125, pp. 2438-2440, 2015.
28. H. H. Abdul-Ra’aoof, A. M. Tiryag, and M. A. Atiyah, "Knowledge, Attitudes, and Practice of Nursing Students about Insulin Therapy: A Cross-Sectional Study," Academia Open, vol. 9, pp. 10.21070/acopen. 9.2024. 8795-10.21070/acopen. 9.2024. 8795, 2024.
29. R. C. o. S. o. E. C. E. Unit, National prospective tonsillectomy audit: final report of an audit carried out in England and Northern Ireland between July 2003 and September 2004: Royal College of Surgeons of England, 2005.
30. M. A. Akber, A. M. Tiryag, and A. Alobaidi, "Nurses’ Knowledge Concerning Developmental Dysplasia of the Hip: A Cross-Sectional Study," American Journal of Pediatric Medicine and Health Sciences, vol. 2, pp. 155-160, 2024.
31. D. K. Pinder, H. Wilson, and M. P. Hilton, "Dissection versus diathermy for tonsillectomy," Cochrane

Database of systematic reviews, 2011.
32. M. A. Mohammad, H. H. Abdul-Ra'aoof, K. A. Razzaq Manahi, and A. M. Tiryag, "Parents' Knowledge and Attitudes toward Testicular Torsion," Bahrain Medical Bulletin, vol. 46, 2024.
33. R. F. Leinbach, S. J. Markwell, J. A. Colliver, and S. Y. Lin, "Hot versus cold tonsillectomy: a systematic review of the literature," Otolaryngology—Head and Neck Surgery, vol. 129, pp. 360-364, 2003.
34. A. M. Tiryag, S. B. Dawood, and S. K. Jassim, "Nurses' knowledge and attitudes about enteral feeding complications by nasogastric tube in intensive care units," Rawal Medical Journal, vol. 48, pp. 689-689, 2023.
35. R. Mösges, M. Hellmich, S. Allekotte, K. Albrecht, and M. Böhm, "Hemorrhage rate after coblation tonsillectomy: a meta-analysis of published trials," European Archives of Oto-Rhino-Laryngology, vol. 268, pp. 807-816, 2011.
36. M. A. Akber, A. M. Tiryag, and A. I. H. Alobaidi, "Nurses' Knowledge Regarding Cast Complications of Limb Fractures: A Cross-Sectional Study," Central Asian Journal of Medical and Natural Science, vol. 5, pp. 195-200, 2024.
37. A. Hoey, N. Foden, S. Hadjisymeou Andreou, F. Noonan, A. Chowdhury, S. Greig, et al., "Coblation® intracapsular tonsillectomy (tonsillotomy) in children: a prospective study of 500 consecutive cases with long-term follow-up," Clinical Otolaryngology, vol. 42, pp. 1211-1217, 2017.
38. E. H. Rahi, Z. M. H. Al-Hejaj, and A. M. Tiryag, "Nurses' Knowledge of Nonalcoholic Fatty Liver Disease: A Cross-Sectional Study," Academia Open, vol. 9, pp. 10.21070/acopen. 9.2024. 10306-10.21070/acopen. 9.2024. 10306, 2024.
39. J. L. Acevedo, R. K. Shah, and S. E. Brietzke, "Systematic review of complications of tonsillotomy versus tonsillectomy," Otolaryngology--Head and Neck Surgery, vol. 146, pp. 871-879, 2012.
40. H. M. Sabty, S. B. Dawood, and A. M. Tiryag, "Nurses' Knowledge and Practices on Influenza Vaccination for Pregnant Women," Jurnal Kebidanan Midwiferia, vol. 10, pp. 50-59, 2024.
41. S. R. Lewis, A. Nicholson, M. E. Cardwell, G. Siviter, and A. F. Smith, "Nonsteroidal anti-inflammatory drugs and perioperative bleeding in paediatric tonsillectomy," Cochrane Database of Systematic Reviews, 2013.
42. A. M. Tiryag, "Revitalizing Hearts: The Transformative Impact of Pacemaker Therapy on Cardiac Conduction Disorders," Academia Open, vol. 9, pp. 10.21070/acopen. 9.2024. 8845-10.21070/acopen. 9.2024. 8845, 2024.
43. L. E. Kelly, M. Rieder, J. van den Anker, B. Malkin, C. Ross, M. N. Neely, et al., "More codeine fatalities after tonsillectomy in North American children," Pediatrics, vol. 129, pp. e1343-e1347, 2012.
44. H. H. Abdul-Ra'aoof, M. A. Akber, F. A. Jassim, A. M. Tiryag, S. S. Issa, M. A. Atiyah, et al., "The Psychological Impact of Violence on Emergency Department and Intensive Care Unit Nurses: A Cross-Sectional Study," Research Journal of Trauma and Disability Studies, vol. 3, pp. 228-233, 2024.
45. J. Windfuhr, K. Savva, J. Dahm, and J. Werner, "Tonsillotomy: facts and fiction," European Archives of Oto-Rhino-Laryngology, vol. 272, pp. 949-969, 2015.
46. I. Zainel, H. Abdul-Ra'aoof, and A. Tiryag, "Mothers' Knowledge and Attitudes towards her Children with Neonatal Jaundice: A Cross-Sectional Study," Health Education and Health Promotion, vol. 10, pp. 565-570, 2022.
47. M. Tingle, "Predicting and Preventing Adverse Drug Reactions and Interactions."
48. H. H. Abdul-Ra'aoof, S. B. Dawood, F. A. Jassim, S. K. Jassim, S. S. Issa, M. A. Akber, et al., "Moderate proficiency in suture techniques among nurses: A cross-sectional study," Journal of Nursing Education and Practice, vol. 14, pp. 50-58, 2024.
49. M. Dhiwakar, W. Clement, M. Supriya, and W. McKerrow, "Antibiotics to reduce post-tonsillectomy morbidity," Cochrane Database of Systematic Reviews, 2008.
50. A. M. Tiryag and H. H. Atiyah, "Nurses' Knowledge toward Bariatric Surgery at Surgical Wards at Teaching Hospitals in Al-Basra City," Indian Journal of Forensic Medicine & Toxicology, vol. 15, pp. 5152-5159, 2021.

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