

Introduction

Malignant tumors of the head and neck have previously been shown to comprise 12% of childhood cancers. The increase in incidence of head and neck cancer among children under 15 has been shown to exceed that of childhood cancer in general.¹ Malignancy is currently the second leading cause of death in children aged 5-9, and third leading cause in children aged 10-14.²

Head and neck neoplasms are complex in management with critical long-term implications. The treatments for pediatric head and neck (H&N) malignancies are multimodal and include:

- Traditional photon radiation
- Chemotherapy
- Surgery
- Proton therapy

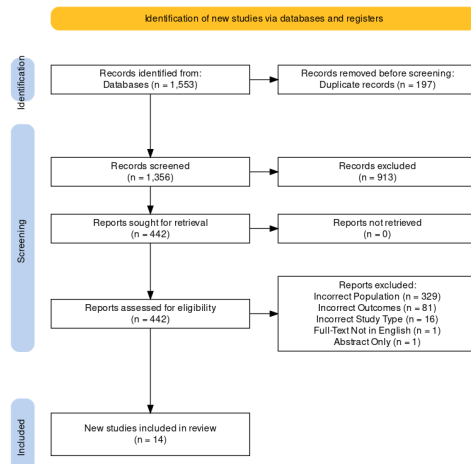
Notably, these therapies can have significant health and functional consequences for growing patients. As survival rates improve, it is imperative to understand how treatment affects communication, feeding, special senses, and quality of life. There is currently no standardized methodology of to assess functional outcomes in patients following treatment.

The aim of this scoping review is to analyze the current body of knowledge related to functional outcomes for pediatric head and neck cancer survivors.

Methods

PRISMA-ScR guidelines were followed. Qualitative, quantitative, and observational studies of pediatric patients (0-21 years) that evaluated functional outcomes after treatment for primary head and neck cancers were included.³

Adult-only, review/editorial papers, non-human, and non-English studies were excluded. Additionally, studies assessing malignancies outside of the head and neck or primary brain tumors were excluded.



Results

Fourteen studies with 561 patients were included. Rhabdomyosarcoma and nasopharyngeal carcinoma were the most frequently studied neoplasms. Swallowing was the most studied outcome, with 64% (9/14) papers reporting dysphagia, odynophagia, oropharyngeal fibrosis, esophageal stenosis, xerostomia, trismus, or general throat/mouth issues. The majority (9/14) of papers reported on long-term functional characteristics as a secondary outcome as opposed to a primary focus of investigation.

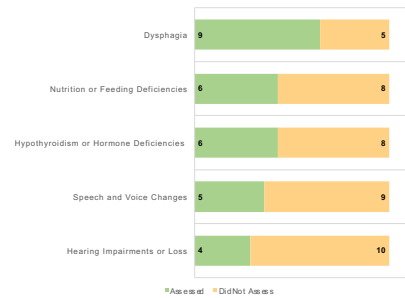


Figure 1. Functional outcomes assessed by included papers.

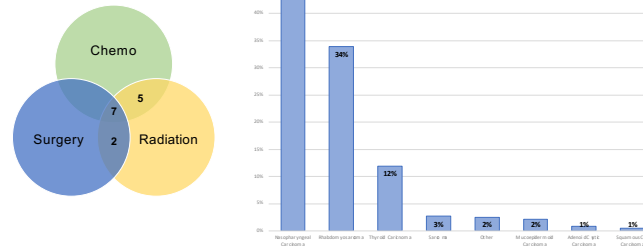


Figure 2. Treatments and neoplasm histology assessed across included studies.

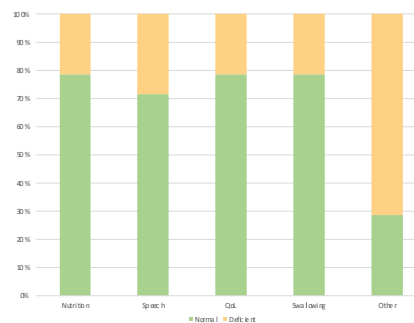


Figure 3. Proportion of patients experiencing given deficiencies post-treatment.

Results (Continued)





Notable gaps in outcome assessment included:

- Rare use of longitudinal measurements of functional or quality of life parameters during treatment and follow-up.
- Lack of clear operational definitions for common deficits in areas such as feeding, nutrition, communication, and social function.
- Quality of life measures that do not specifically assess treatment impact on vital functions in the head and neck.

Conclusion

In this scoping review, swallowing was the most frequently reported functional outcome following treatment of pediatric H&N cancer. Standardized assessments were rare. Heterogeneity in tumor and treatment type limits the ability to amalgamate evidence from different studies. Few studies focused on functional consequences as a primary outcome, highlighting a paucity of high-quality evidence and heterogeneity in measurement tools in this area.

Key Takeaways

-  Need for standardized methods to assess functional outcomes at multiple time points during and after treatment
-  Assessment of physiologic capabilities like hearing, voice change, endocrine deficiencies, or dysphagia may not capture patient-centered outcomes
-  Feeding, nutrition, and swallowing are commonly affected after treatment for H&N cancer
-  Notable gaps exist in systematic evaluation of return to oral diet, assessment of communication, and measurement of social and emotional well-being

References

1. Albright JT, Topham AK, Reilly JS. Pediatric Head and Neck Malignancies: US Incidence and Trends Over 2 Decades. Archives of Otolaryngology–Head & Neck Surgery 2002;128(6):655-59 doi: 10.1001/archotol.128.6.655[published Online First: Epub Date].
2. United States Department of Health and Human Services (US DHHS), Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS). Underlying Cause of Death by Single Race 2018-2021 on CDC WONDER Online Database, released 2022.
3. Haddaway, N. R., Page, M. J., Pritchard, C. C., & McGuinness, L. A. (2022). PRISMA2020: An R package and Shiny app for producing PRISMA 2020-compliant flow diagrams, with interactivity for optimised digital transparency and Open Synthesis Campbell Systematic Reviews, 18, e1230. <https://doi.org/10.1002/cl2.1230>